PERCEPTION OF LECTURERS AND UNDERGRADUATE MEDICAL (MBChB) AND NURSING (BScN) STUDENTS REGARDING THE ADEQUACY OF TEACHING AND LEARNING RESOURCES IN TWO KENYAN PUBLIC UNIVERSITIES

BY

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MOI UNIVERSITY

DECLARATION

DECLARATION BY CANDIDATE

This thesis is my own original work and it has not been presented for a degree in any other University. No part of this thesis may be reproduced without prior written permission of the author and/or Moi University.

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DEDICATION

This thesis is dedicated to my caring mother Mrs. Rose Muthoni Njeru for her consistent support during my entire schooling including this PhD programme. I also dedicate it to my lovely daughter Christine Zawadi Njoki for bearing with me, in her tender age, during my busy period of study while pursuing my Doctor of Philosophy degree.

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ABSTRACT

Background: For effective learning to take place in any academic institution, there must be adequate resources to facilitate learning. High enrolment in public universities has led to reduced learning space and sharing of few teaching and learning resources by lecturers and students respectively. This has led to crowding in classrooms, laboratories, libraries and clinical placement sites. Recruitment of lecturers has not matched the increased number of students as would be expected. Financial resources in Public Universities are also limited. The quality of teaching has therefore been compromised and students have developed resentment.

Objectives: The broad objective of this study was to assess the perceptions of the adequacy of teaching and learning resources by MBChB and BScN lecturers and students in two public universities. Specific objectives were to: assess the lecturers' perceptions of adequacy of teaching resources, assess students' perceptions of adequacy of learning resources, identify the challenges encountered by lecturers in acquiring and utilizing teaching resources and compare the perceptions of the adequacy of teaching and learning resources by lecturers and students between the two Schools in the two universities.

Methods: A mixed methods study design was used, incorporating both quantitative and qualitative research. Quantitative data was collected from university lecturers of MBChB and BScN programmes in Moi University (university A) and the University of Nairobi (university B) using self-administered structured questionnaires. The study population included 100 lecturers (50 from each university). Convenience sampling was used to select lecturers for this study. Qualitative data was obtained from purposively selected 38 students' representatives in the MBChB and BScN programmes (2 representatives per academic year) using an interview guide. There were four Focus Group Discussion (FGD) groups with 8 to 10 students per FGD. Quantitative data was coded and entered into Microsoft Excel Spreadsheets and analyzed using SPSS version 22 for frequencies, means and percentages and then presented using prose, tables, pie charts and graphs. Qualitative data from FGDs was transcribed, contextual narratives written and then summarized into five themes.

Results: Lecturers in University A perceived that they had an ill-equipped library (67%) and ill-equipped skills laboratories (89%). Lecturers in university B perceived that there were inadequate teaching resources including overcrowding of students in lecture rooms (81.6%). In university B, 52.4% of lecturers perceived skills laboratories to be ill equipped. Lecturers in university A perceived that the procurement process was long and tedious (24%) compared to university B SOM (43%). Pearson's Chi-Square was done to test the hypothesis. The result showed a *p* value of 0.88 compared to a significant *p* value of 0.05. This higher probability showed that the null hypothesis couldn't be rejected. FGD results: More students from university A perceived that the library had old textbooks and few students' computers, and there were few equipment in the skills laboratories. 80% of the students in university B reported crowding in classrooms and clinical sites**,** and needed more computers in the library. Medical students in B stated that they did not have a skills laboratory of their own but shared the one in the School of Nursing. A comparison between the two universities indicated that University A had better equipped skills laboratories while B had a better-stocked library.

Conclusion: Lecturers in both universities perceived that they had inadequate teaching resources, which included classroom space and poorly equipped skills laboratories. Students in both universities perceived that they had congestion in classrooms (university B), poorly equipped skills laboratories, inadequate number of computers and old textbooks (university A).

Recommendations: In both universities, more teaching resources should be available. Learning resources for students need to be improved especially classroom space, computers, skills laboratory (university B) and new text books for the library in university A. Student intakes in university B should match the available teaching resources. A skills laboratory should be established for medical students in university B and more equipment availed for skills laboratories in both universities A and B.

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ACRONYMS AND ABBREVIATIONS

BScN	Bachelor of Science in Nursing
CUE	Commission for University Education
IREC	Institutional Research Ethics Committee
LCD PROJECTOR	Liquid Crystal Display projector
MBChB	Latin for: Medicinae Baccalaureus, Baccalaureus Chirurgiae**;** English: Bachelor of Medicine and Bachelor of Surgery
MU	Moi University
NACOSTI	National Commission for Science, Technology and Innovation
NCK	Nursing Council of Kenya
SOM	School of Medicine
SON	School of Nursing
SPSS	Statistical Package for Social Sciences
UoN	University of Nairobi

OPERATIONAL DEFINITIONS OF TERMS

Adequacy of teaching/learning resources: This refers to the availability of human resource, financial resources, teaching resources (aids), physical plant or classroom space, and practical facilities like laboratories and hospitals of different kinds for use by students. In this study adequacy of resources depends on what is prescribed by the professional boards that regulate learning like the Commission for University Education (CUE), the Medical Practitioners and Dentists' board and the Nursing Council of Kenya.

Teaching: This is a term that defines the activity of helping people to learn. In this study it refers to helping MBCHB and BScN students to learn within their programmes.

Learning: This may be defined as the process of acquiring new habits, knowledge and skills which enable students to do something that they could not do before.

Teaching environment: This refers to the place or area where the lecturer presents learning including a classroom, skills Lab, Science Lab or hospital.

Audio visual aids: This refers to educational/instructional materials that are used by a teacher to reinforce learning by stimulating the visual and hearing senses. Examples include charts, LCD Projector slides, films and videos.

Human resource: This term refers to an employee within an institution or organization. In this study it will refer to an administrator, lecturer or support staff.

Financial resources: This is the money available in a business or institution for spending in terms of cash, liquid securities and credit lines.

Manikin: This is a full human sized dummy or doll using for teaching skills to medical and nursing students.

Lecturer: This is a trained health professional who presents teaching to students in an academic environment. In this study this is a University lecturer in Moi University of University of Nairobi.

Student: In this study a student is a registered student of the University in Moi University or University of Nairobi who is undertaking learning activities.

Skills Laboratory: A well set-up room specifically set aside for teaching students skills using different models and equipment.

CHAPTER ONE

1.0 INTRODUCTION AND BACKGROUND

1.1 INTRODUCTION

This chapter presents the background to the study, statement of the problem, research objectives, research questions, justification, significance, hypothesis, scope and limitations, theoretical framework and conceptual model.

1.2 BACKGROUND OF THE STUDY

In order for effective learning to take place in any learning institution, there must be enough resources to facilitate learning (*Amri et al.*, 2005). In medical education the teacher targets adult learners who have specific characteristics including:

- They come with their own perceptions about how to learn.
- Are self-directed: the learner establishes his or her own objectives and determines what he or she needs to learn.
- Are self-motivated: the learner needs to have a self-drive towards learning
- Come with high expectations of achievement in learning.
- Have varied backgrounds in terms of previous learning experiences
- Bring own experiences
- Their learning competes with other adult interests
- Prefer experiential learning because learning through activity enhances understanding of the subject matter.
- Enjoy open-minded, critical reflective sharing (*Mutema et al., 1999*)

Teaching and learning resources are very important in Health Education. According to *Mutema et al.,* (1999), learning resources play a major role in problem-based learning.

Apart from availability of learning resources, adequacy, relevance and usability of such resources are very critical in teaching/learning situations (*Mutema et al.,* 1999).

There are five major categories of teaching/learning resources. The first category is that of human resource which includes administrative team, lecturers and support staff. The second category includes learning resources like audiovisual aids including projectors, books and periodicals (Quinn and Hughes, 2007). The third category is physical plant or classroom space and also includes satellite campuses and practical facilities for (Kibore et al, 2015). The fourth type of resource that all other resources depend on is financial resources. The two main categories of financial resources include capital budget and operating budget (Tappen, 2001). The fifth type is time as a resource (Locke, 2018). Though not always viewed as a resource, it is very necessary that instructors plan time for their students, not only for classroom instruction but also for individual couching.

Adequate teaching and learning resources refer to the availability of the above mentioned resources for students' learning. For every group of students there must be well qualified lecturers, adequate classroom space for a specified number of students, science labs, skills lab, computer lab and a well-equipped library (*Amri et al., 2005).* In addition to this, every lecture room should have enough teaching aids for use by teachers including Chalk boards/white boards, Overhead projectors, Laptops, Liquid Crystal Display (LCD) projectors, Screens and Flipcharts. If any lecture environment falls short of these requirements, then there is inadequacy of teaching resources (Mbirithi, 2013).

Medical education students also need one or more teaching hospitals where they can learn skills on real patients (*Ngatia et al, 2009).* In many Kenyan Universities, there is evidence of inadequate teaching resources which may have resulted from the rapidly increasing number of students with a slower pace of institutions allocating more resources resulting in crowded classrooms, libraries, skills labs and computer labs. According to Tanner and Lackney (2006), for educators to be successful, the availability of resources by students and faculty is important. Students that do not have access to learning spaces, resources and teachers will be at a disadvantage. The reality of limited physical and economic resources demands the sharing of all available instructional resources (Tanner & Lackney, 2006). Time should be utilized effectively by both lecturers and students. Students need to plan for classroom lessons plus time for assignments and other activities. Teachers who don't prepare adequately for their students do not delivery quality teaching to the people who they are training.

Resources are very important in the education of medical professionals. Doctor (Kanni, 1987) had indicated that if medical professionals were to be effective four major indicators were to be constantly and carefully monitored and evaluated, specifically:

1. Performance of educators during training
2. Performance of students upon graduation
3. Effect of health care on individuals
4. Effect of health care on community.

According to Kanani as stated above if the above indicators are not carefully looked at and ensured all efforts will be in vain. In order to elaborate on the importance of this study it is important to mention that for the first indicator, if the human resource, lecturer is not adequately trained or qualified he is a dangerous resource right from the beginning. It is also notable that if the human resource is qualified but has a negative

attitude he may not deliver the required training to the student and therefore the student may never be effective. And so this first indicator must be approached from all angles possible to make sure that students learn from the best possible professionals.

The second indicator involves the performance of students upon graduation. This implies that however good the training may be said to have been, if the graduates are performing poorly their training cannot have been effective, because the results show clearly when the training was effective. This implies that there must have been a short coming during the training and resources need to be investigated to determine what was amiss. If students were trained and qualified and cannot make a diagnosis or cannot give correct treatment, there must have been a lack of/or shortage of resources to ensure effective learning for the graduates.

The third indicator refers to effective care on individual patients/ clients. If every patient the graduates treat is dying, is maimed or is running away to seek treatment and care elsewhere it means again that effectiveness was not achieved and that there must have been something amiss with the resources, human or material.

The fourth indicator refers to the effect of health care on community served. Traditionally this has been referred to in literature as impact of care. If a community needed health care and a lot of effort was geared to help the community, the results should then be observable and measurable. If for example there was a lot of morbidity and mortality in the community after instituting effective health care the morbidity and the mortality rates would go down. But if the rates remained the same or went higher then care could not be effective and nobody should make such a claim. It is inevitable to conclude that in order for effective education and effective care to become a reality adequate resources must be availed especially for health care professionals. And why all these for health care professionals? These are professionals who deal with human

life and all efforts must be dedicated to ensuring that their training, their theory and their practice rate highly in all dimensions

According to Taylor, proper time management increases productivity (Taylor, 2015). Taylor indicates that time is another important resource and needs to be considered as such. Since the 1980's when we discussed resources in general literature, we begun discussing resources in five distinct categories as has been alluded to severally in this study. These resources include; human resources, teaching and learning resources, infrastructure and satellite campuses, financial resources and time as a resource.

This study aims at determining the learning resource availability, adequacy and challenges faced by lecturers and students of the MBChB and BScN programmes in two selected public Universities in Kenya.

1.3. STATEMENT OF THE PROBLEM

The number of students in medical education is growing rapidly in Public Universities. As these numbers continue to increase this has led to problems like crowding in classrooms, libraries, computer labs and inadequate laboratory facilities (*Ngatia et al.,* 2009)). Libraries are also not well equipped with the current textbooks and journals. Learning resources remain limited and therefore do not correspond to the number of students. The ratio of the number of students per lecturer shows that one particular lecturer has to take care for a large number of students. The Nursing Council of Kenya (NCK) recommends a ratio of 1:10 students per lecturer and 40 students per class (Ogeng'o, 2015). The Kenya Medical Practitioners and Dentists Board recommends a class of 40-80 students for medical students depending on the size of the available classroom space. Individual Schools of Medicine are allowed to make decisions on the number of students in each class in different Universities.

A teacher's discretion is required in the use of science laboratories and skills laboratories depending on the space available and the number of resources for laboratory work. Laboratory sciences are critical in the medical profession. If a student trained in the medical laboratory sciences is good in theory, it does not matter how good he or she is. If the student is not good in practice, the student cannot be said to be good and if that student is not good in practice, he or she may, as a matter of fact be dangerous. A student in a laboratory setting who is not skillful in knowledge as well as attitude may pose great danger, not only to patients, fellow workers but to self. Similarly, medical professionals in clinical settings may need to be dealing with only the number and resources as specified by education experts. In summary this referred to as staff/ student ratios.

It is not uncommon to see teachers in laboratories trying to demonstrate a procedure to 40 students and only 10 of the students on the front can clearly see what is being demonstrated and yet all the students will be expected to perform what is being demonstrated. Similarly, even in bedside clinical methods doctors can be seen demonstrating procedures done on human patients in a crowded hospital and yet out of 10 surrounding students only 2 students can see clearly what is being demonstrated. The tragedy of all this is that the one being trained will confront situations in which they are expected to perform well even in life saving situations

Recruitment of lecturers does not match the increase in the number of students which should actually be the case (Momanyi, 2015). In many training institutions, trainers of health workers are over worked and overburdened. Since the 1980s in Kenya there has been a call for double intakes in institutions of higher learning. This call has been brought about by many people successfully completing high school education. In order

to accommodate them, institutions training health care professionals have not been spared.

Clinical sites, especially teaching and referral hospitals are also getting crowded with the increasing number of students, therefore hospitals and other health facilities need to plan for more students for clinical experience than the ones they planned for before (Lippincott, 2017). Due to these challenges, learning is no longer of the preferred quality according to the required standards and students have developed resentment because they realize that there is a problem that they cannot solve for themselves. The availability of financial resources in Public Universities is an obvious problem and some Universities are in heavy debts (Rajab & Nyaundi, 2018). This study investigated the perception of adequacy of teaching resources in two public Universities in Kenya and the researcher has put down recommendations which if implemented can solve the challenges identified in the study.

1.5 BROAD OBJECTIVE

The purpose of this study was to assess the perceptions of lecturers and undergraduate Medical (MBChB) and Nursing (BScN) students regarding the adequacy of teaching and learning resources in two Kenyan Public Universities.

1.6 SPECIFIC OBJECTIVES

This study was guided by the following specific objectives:

1. To assess the perceptions of adequacy of teaching resources in the MBChB and BScN programmes by lecturers in the two Public Universities.

2. To assess the perceptions of adequacy of learning resources in the MBChB and BScN programmes by students in the two public Universities.

3. To Identify the challenges encountered by lecturers in acquiring and utilizing teaching resources.

4. Compare the perceptions of the adequacy of teaching and learning resources by lecturers and students between the two Schools in the two Universities.

1.7 RESEARCH QUESTIONS

1. What are the perceptions of lecturers on adequacy of teaching and learning resources in the two Universities?

2. What are the perceptions of students on adequacy of teaching and learning resources in the two Universities?

3. What are the challenges that lecturers in the MBChB and BScN programmes encounter when acquiring and utilizing teaching/learning resources?

4. What is the comparison in the perceptions of adequacy of teaching and learning resources by lecturers and students between the two Schools in the two Universities?

1.8 HYPOTHESIS

Null hypothesis – there is no relationship between teaching resources and Schools in the two Universities.

1.9 JUSTIFICATION OF THE STUDY

There has been an uncontrolled wave of student intakes into medical courses in Kenyan Universities and this may compromise the quality of education and service provision by the graduates (*Amri et al., 2005*). There are increasing cases of student strikes before graduation possibly because their learning expectations have not met. Lack of teaching

facilities and equipment has been one of the causes of concern especially in technical and medical courses. This has resulted to various demonstrations and strikes so as to make the institutions' management to act on the issue (Kennedy, 2016).

The training facilities are outstretched and therefore the practical learning experiences in the skills labs may not attain the teaching standards because the practical tools are inadequate. Skills Labs offer the possibility of training students on clinical procedures in a safe environment prior to the real life application at the bedside or in the operating room (Bugaj & Nikendi, 2016). Learning clinical skills on real patients not only jeopardizes patients' safety but also raises many ethical concerns (*Hashim et al., 2016).*

The reason why I conducted this study is because there is a great need to investigate why there are challenges of teaching resources in Universities and get better ways of changing the situation for the better.

By conducting this study, the researcher believed that the findings of this study will benefit not only public universities but also private ones.

1.10 SIGNIFICANCE OF THE STUDY

This study is an eye opener for Health educators because many of them are struggling with few resources for large numbers of students. The study will reveal the seriousness of admitting only the approved number of students by Universities as per the recommendations of the professional boards. The study will recommend better methods that can help to alleviate this near-crisis situation so that health educators can effectively utilize the few resources that are at hand in the Universities.

The study findings will be disseminated in different forums like seminars, workshops and conferences with the aim of universities acting on the recommendations.

The study will also be published in international peer-reviewed online journals so that the findings and recommendations can be read by many University administrators and lecturers. This may help to change the current situation positively.

1.11 EXPECTED OUTCOME OF THE STUDY:

- Planning for the MBChB and BScN programmes will be improved in terms of admission of student numbers.
- There may be improvement in the supply of teaching and learning resources like books, staff, classroom space, skills labs, computer labs, clinical areas and finances.

1.12 SCOPE OF THE STUDY

This study covered two Public Universities namely: Moi University (University A) which is located in Uasin Gishu County, and University of Nairobi (University B) which is located in Nairobi County. The study was conducted in the Schools of Medicine and Schools of Nursing. The reason why the researcher chose these two Universities is because cover other Kenyan Universities with similar programmes because they were among the earliest Universities to begin these two programmes in Kenya and were therefore sufficient enough to provide the necessary information required in the study.

1.13 LIMITATIONS OF THE STUDY

Limitations of the study included the uncertainty of getting all respondents fill up the questionnaires. there was also the possibility of students exaggerating information that they responded with during interviews in Focus Group Discussions (FGDs). Another limitation that was observed after data analysis was that generalization of the findings could not be done in the two Universities, because each University had its own different and unique needs of teaching and learning resources.

1.14 THEORETICAL FRAME WORK

ROBERT GAGNE'S THEORY OF LEARNING

The researcher adapted Gagne's theory of learning. Robert Mills Gagné (August 21, 1916 – April 28, 2002). was an American educational psychologist best known for his *Conditions of Learning*. He pioneered the science of instruction during World War II when he worked with the Army Air Corps training pilots. He went on to develop a series of studies and works that simplified and explained what he and others believed to be "good instruction."

Gagné was also involved in applying concepts of instructional theory to the design of computer-based training and multimedia-based learning.

His work is sometimes summarized as "The Gagnés assumption". The assumption is that different types of learning exist, and that different instructional conditions are most likely to bring about these different types of learning.

1.14.2. Gagne's Eight Categories of Learning

Based on the degree of complexity of the mental process, Gagne suggested a system of analyzing different conditions or levels of learning from simple to complex. According

to Gagné, the higher order of learning in the hierarchy is built upon the lower levels, requiring a greater amount of previous knowledge to progress successfully. This analyzes final capability into subordinate skills in an order such that the lower levels can be predicted for positive transfer of higher level learning. The lower four orders focus on the behavioral aspects of learning, while the higher four focus on the cognitive aspects. In his original study on instruction, through a study derived from an analysis of learning of a task of constructing formulas for the sums of number series, Gagné attributed individual differences or differences in intelligence in learning.

1. Signal Learning. This is the simplest form of learning, and consists essentially of the classical conditioning first described by the behavioural psychologist Pavlov. In this, the subject is 'conditioned' to emit a desired response as a result of a stimulus that would not normally produce that response. This is done by first exposing the subject to the chosen stimulus (known as the conditioned stimulus) along with another stimulus (known as the unconditioned stimulus) which produces the desired response naturally; after a certain number of repetitions of the double stimulus, it is found that the subject emits the desired response when exposed to the conditioned stimulus on its own. The applications of classical conditioning in facilitating human learning are, however, very limited.

2. Stimulus-response learning. This is a somewhat more sophisticated form of learning, which is also known as operant conditioning, was originally developed by Skinner. It involves developing desired stimulus-response bonds in the subject through a carefully-planned reinforcement schedule based on the use of 'rewards' and 'punishments'. Operant conditioning differs from classical conditioning in that the reinforcing agent (the 'reward' or 'punishment') is presented after the response. It is this

type of conditioning that forms the basis of programmed learning in all its various manifestations.

3. Chaining. This is a more advanced form of learning in which the subject develops the ability to connect two or more previously-learned stimulus-response bonds into a linked sequence. It is the process whereby most complex psychomotor skills (eg riding a bicycle or playing the piano) are learned.

4. Verbal association. This is a form of chaining in which the links between the items being connected are verbal in nature. Verbal association is one of the key processes in the development of language skills.

5. Discrimination learning. This involves developing the ability to make appropriate (different) responses to a series of similar stimuli that differ in a systematic way. The process is made more complex (and hence more difficult) by the phenomenon of interference**,** whereby one piece of learning inhibits another. Interference is thought to be one of the main causes of forgetting.

6. Concept learning. This involves developing the ability to make a consistent response to different stimuli that form a common class or category of some sort. It forms the basis of the ability to generalize, or classify.

7. Rule learning. This is a very-high-level cognitive process that involves being able to learn relationships between concepts and apply these relationships in different situations, including situations not previously encountered. It forms the basis of the learning of general rules and procedures.

8. Problem solving. This is the highest level of cognitive process according to Gagne. It involves developing the ability to invent a complex rule, algorithm or procedure for the purpose of solving one particular problem, and then using the method to solve other problems of a similar nature.

If one were to follow the line of thinking envisaged above, problem based learning adopted by Moi University, which is one of the institutions targeted by this study it is clear that we are looking in the right direction and that we are right in believing that the best of learning must ultimately achieve problem solving. Traditional teaching which seemed to emphasize rote memorization did not always end up achieving problem solving. The traditional teaching method included lecture, large group session, demonstrations, role plays, practical/ laboratory work, field practice, clinical practice and even apprenticeship. Although teaching took place, actual learning did not necessarily take place. In modern times, a concept widely adopted by Moi University College of Health Sciences in order to facilitate true problem solving, students need to be taught using modern innovative methods. Such methods have been alluded to severally in this study. Such methods emphasize active involvement of students during the teaching, learning process. Such innovative teaching/ learning methods include Problem Based Learning (PBL), Community Based Education and Service (COBES), Self-Directed Learning (SDL), SPICES – Student Centred, Problem Based Integrated, Community Based, Elective, and Systematic, Computer Assisted Instruction including E-Learning. Such methods maximize student involvement and eventually problem solving

GAGNE'S LEARNING TAXONOMY

The taxonomy of learning comprises **five categories**:

1. Intellectual skills
2. Cognitive strategy
3. Verbal information
4. Attitude
5. Motor skills

Adapted from Google diagrams in September 2020

1. **INTELLECTUAL SKILLS**

- There are **four levels** within the intellectual skills domain which include **discrimination, concrete concept, rule using** and **problem solving.**
- **Discrimination** is making different responses to the different members of a particular class. Seeing the essential differences between inputs and responding differently to each. Example: A Medical or Nursing student being able to distinguish between normal and abnormal readings of blood pressure on a sphygmomanometer.

- **Concrete concept** is responding in a single way to all members of a particular class of observable events. Seeing the essential similarity among a class of objects, people, or events, which calls for a single response.

  Example: Classifying drug categories by their actions on body systems.
- **Rule using** is applying a rule to a given situation or condition by responding to a class of inputs with a class of actions. Relating two or more simpler concepts in the particular manner of a rule. A rule states the relationship among concepts.
- Examples: The use of aseptic technique during invasive procedures e.g. during major and minor surgery.
- **Problem solving** is combining lower level rules to solve problems in a situation never encountered by the person solving the problem. This may involve generating new information.

  Example: When Medical and Nursing students are taught using Problem Based Learning (PBL), they are given assignments in which they have to look for new information to present in class.

2. COGNITIVE STRATEGY

Cognitive Strategy is an internal process by which the learner controls his/her own ways of thinking and learning.

Example: Individual learning where a student searches for knowledge within his learning domain from different sources.

3. VERBAL INFORMATION

Verbal Information includes labels and Facts, and bodies of Knowledge.

a) **Labels and facts** refer to naming or making a verbal response to a specific input. The response may be naming or citing a fact or set of facts. The response may be vocal or written. Examples: Naming microorganisms and diseases that they cause. Also recalling normal and abnormal values in various lab tests.

b) **Bodies of Knowledge** refers to recalling a large body of interconnected facts. Example: paraphrasing the meaning of textual materials or stating rules and regulations.

Example: Remembering and performing the steps of a surgical procedure from the beginning to the end and the post-operative management of the patient.

4. ATTITUDE

Attitude is an internal state which affects an individual's choice of action toward some object, person, or event.

Examples: Explaining a procedure to the patient before performing it. It also includes good relationships with patients including observing respect and maintaining human dignity when managing patients.

5. MOTOR SKILLS

Motor Skills refer to bodily movements involving muscular activity. Examples are when Medical and Nursing students are performing demonstrations in the skills laboratories or when they are taking history and performing physical examination of

patients. Taxonomy of skills is very important in the medical profession. As illustrated by AMREF (Undated early 1980s doc) it shows 4 levels of skills which include:

1) Gross bodily movement
2) Fine coordinated movement
3) Non-verbal communication
4) Special behaviors

The above taxonomy was used extensively in medical training institutions to gauge how well students had achieved required medical skills. More recently as indicated in (Kang'ethe, 2013) in an Inaugural address at Moi University School of Medicine a more comprehensive taxonomy of skill development was cited as articulated in Daves Classification of the psychomotor domain. This classification illustrates step by step how a student improves in skills development. These stages are as outlined below:

Stage 1: Imitation – Observing and return demonstration

Stage 2: Manipulation – Following instructions and practicing

Stage 3: Precision – Performing skill independently and competently

Stage 4: Articulation – Coordinating, modifying, combining and resequencing skill

Stage 5: Naturalization – Naturally performing like expert

The fifth stage described above indicates the highest level of skill development to which all trainers must aspire for their students.

Further to these descriptions above, even when trainers write training programmes for their students they need to aim at objectives which compel the students to demonstrate, to exhibit, and to show the required skills. Educators and trainers need to get students to adapt, to adjust, to alter, to correct, to customize, to develop, to modify, to revise and to do and carry out the skills required for the particular training.

AN ILLUSTRATION OF GAGNE'S NINE EVENTS OF INSTRUCTION

Adapted from Google diagrams in October 2020

APPLICATION OF GAGNE'S THEORY IN THIS STUDY

1. Signal Learning

This is simple learning by conditioned stimulus response. Examples in this study are: keeping time for classes according to the time table for both lecturers and students. It also includes both lecturers and students knowing the time to take their lunch breaks.

2. Stimulus-response learning

This is an application of operant conditioning where someone receives a reward or punishment. A good example in teaching and learning is that when a student works hard they earn good marks or grades as a reward. If a student is absent from class or clinical placement area, he/she is liable for a penalty or punishment according to the rules and regulations of the institution.

3. Chaining.

This is the act of connecting information learnt earlier in order to perform a skill. In Medical and Nursing education, students learn how to perform different procedures which are applicable to patients. The ability to remember every step of the procedure and performing it competently may be referred to as chaining in this study.

4. Verbal association.

This is a form of chaining in which the links between the items being connected are verbal in nature. As Medical and Nursing students are taught how to carry out procedures, they are also taught how to communicate with patients e.g. how to explain a procedure to a patient before the procedure is carried out.

5. Discrimination learning.

This involves developing the ability to make appropriate (different) responses to a series of similar stimuli that differ in a systematic way. The process is made more difficult by the phenomenon of interference**,** whereby one piece of learning inhibits another. Interferences for students in a class could be done by a teacher when making announcements or when reprimanding a student. Power failure during projection can also interfere with learning. The student is expected to respond appropriately.

6. Concept learning

This involves developing the ability to make a consistent response to different stimuli that form a common class or category of some sort. In application of this theory to the thesis, a Medical or Nursing student should be able to take patients' history appropriately and make a diagnosis after investigations (including vital signs).

7. Rule learning.

This is a very-high-level cognitive process that involves being able to learn relationships between concepts and apply these relationships in different situations, including situations not previously encountered. It forms the basis of the learning of general rules and procedures. In Universities, there are many rules and regulations that all students must comply to. There are also general procedures that must be followed administratively.

8. Problem solving.

This is the highest level of cognitive process according to Gagne. It involves developing the ability to invent a complex rule, algorithm or procedure for the purpose of solving one particular problem, and then using the method to solve other problems of a similar

nature. In the School of Medicine, students should be able to diagnose patients and treat different conditions effectively. In the Schools of Nursing, the students should be able to make a Nursing diagnosis and plan for effective nursing care for the patients.

NB:

All the above eight categories of learning are applicable if teaching and learning resources are available and are also adequate.

APPLICATION OF THE NINE EVENTS OF INSTRUCTION BY GAGNE IN THIS STUDY

1. GAIN YOUR LEARNER'S ATTENTION (RECEPTION)

As soon as the teaching and learning experience begins, the teacher must capture the learner's attention. Presenting a powerful stimulus at the start is essential for gaining learner interest and sustaining motivation and engagement. Present a good problem or new situation in a stimulating and engaging way.

This means that the teacher must introduce the topic to be taught very well. In this study an introduction on PowerPoint presentation, using an LCD projector would capture the learner's attention effectively.

Ways of gaining learners' attention:

- Play a humorous video clip
- Ask a thought-provoking question
- Tell an emotional story
- Share surprising statistics or facts
- Tell a joke

- Poll the audience
- Present a challenge
- Play a game
- Have learners ask questions
- Do an ice-breaker activity
- Have a controversial discussion

  All the above are applicable in this study.

2. INFORM LEARNERS OF THEIR OBJECTIVES (EXPECTANCY)

Once the learners are engaged, they need to know what to expect from the learning experience. This helps them to understand the full picture. Providing expectations around what they will learn helps put the audience in a learning mindset. Describe the learning outcomes, the aims and objectives of the session, what skills will be accomplished and how they will be able to use the knowledge, give a demonstration if appropriate.

Ways of stating objectives:

- Create an objective slide
- Explain what the audience will learn and why it is important
- Describe the goals and outcomes of the learning experience
- Explain how this information will benefit the learners

  In this study stating objectives is very important for the learners before the learning content is given by the teacher.

3. STIMULATE RECALL OF PRIOR LEARNING (RETRIEVAL)

In this step, the goal is to activate the recall of that old knowledge. Once the old knowledge is recalled (or remembered), it makes it easier to connect the dots to new information.

Remind students of prior knowledge relevant to the current lesson (facts, rules, procedures or skills). Show how the sessions are connected. Provide the student with a framework that helps learning and remembering.

That is, new knowledge builds upon old knowledge that's already stored in our long-term memory.

Methods of stimulating recall:

- Ask questions from the last lesson
- Tests can be included.
- Conduct quizzes
- Post discussion board questions related to prior knowledge
- Perform pre-tests to understand what the audience already knows
- Create lesson plans that build upon each other

In this study, evaluation of learning is deemed important for learners in both programmes.

4. PRESENT STIMULUS MATERIAL TO BE LEARNED (SELECTIVE PERCEPTION)

Use a mixture of media e.g. text, graphics, simulations, figures, pictures, sound, etc. e.g. follow a consistent presentation style, chunking of information (avoid memory overload, recall information).

As you're developing your presentation of learning content, it's important to remember a few key tips. Make sure your learning content is well-organized and structured in

smaller chunks. Especially in eLearning, ensure that the content is engaging by using images, videos, and relevant multimedia.

Methods of presenting the learning content:

- Assign text books/articles from journals
- Watch videos
- Perform lectures
- Require writing (or notes)
- Assign activities and projects
- Post homework assignments

This study emphasizes the adequacy of types of media (teaching resources) in order to enhance learning.

The significance of this above paragraph can best be illustrated by studies which have been conducted since the 1980s up to the beginning of this century. It is now common knowledge to all educators that direct teaching can be very boring and hence the need to mix the use of projected and non-projected teaching aids. Such teaching aids have been divided into projected and non-projected teaching aids and these include, traditionally, among the Non-projected: Wall-charts, flip-charts, posters, handouts, models, magnetic boards, plastic adhesive aids and flannel graphs. All of these have been used creatively by many educators of health care professionals with great advantage to student learning.

Among the Projected teaching/learning aids, among the most commonly used are: Sound-film projectors, film-strip projectors, slides projectors, overhead projectors, radio-cassette recorders, tape-recorders and episcopes. Some of the above mentioned have been overtaken by advancing technology by so far that they have been largely forgotten by many modern educators. More recently, many medical educators have

found themselves almost completely addicted to the combination of laptop computers and the Liquid Crystal Display, commonly known simply as LCD. Many educators come to class and simply hook up their laptops and the LCD's and continue teaching.

It is notable at the time of this study that, COVID 19 Pandemic has forced educators to aggressively seek innovative use of technology to facilitate teaching/learning. Specifically, the pandemic has forced social distancing and stay-at-home policies. These policies have necessitated maximization of distance learning techniques including E-Learning. These have further necessitated the combination of laptop/LCD plus internet connectivity to allow teachers and students to interact.

Accordingly, educators of health professionals will have to adapt to increasing demands in order to reach their students. They will also have to learn new vocabulary such as "blackboard", KENET, ZOOM, MUSOMI, GOOGLE-TEAMS etc. in order to choose which of the available will best suit their students.

5. PROVIDE GUIDANCE FOR LEARNING

As an instructor, you need to make the learning experience as simple and straightforward as possible. Sometimes that means providing exact instructions on where to click and what to do next. It may seem intuitive to you, but it often helps to be overly clear in your instructions to avoid any confusion.

Show examples and demonstrate the relevance of the materials. Use different approaches to demonstrate the same information (**semantic encoding**).

Methods of providing learning guidance:

- Provide expectations as needed
- Write clear and concise instructions
- Provide an accessible 'next' button for online learning experiences

- Include tips on how best to navigate the course

  Teaching and learning is made easier when a student sees a picture or model of what is being taught.

6. ELICIT PERFORMANCE (RESPONSE)

After content is presented, you need to allow time for learners to practice. The mix of repetition and recall is critical to any deep-learning. After all, this is the first time your audience has the chance to apply what they've learned.

Let the student do something with the newly acquired behaviour, practice skills or apply knowledge.

Ways of eliciting performance:

- Knowledge checks, quizzes, and tests
- eLearning branching scenarios
- Activities, projects, and writing assignments
- Role-playing situations
- Group discussions and sharing

  In this study both Medical and Nursing students need to practice what they have been taught in a skills lab. They also need to be evaluated by the lecturers on what they have learned using quizzes.

7. PROVIDE INFORMATIVE FEEDBACK

Personalized immediate feedback is most effective for learning. Feedback is the only way your learners know what they're doing correctly and what they need to improve upon. Show correctness of the student's response, analyze learner's behaviour (or let him do it), maybe present a good (step-by-step) solution of the problem - model answer. (reinforcement).

Make sure the learning experience has some type of feedback system built-in. This is easier to implement for instructor-led learning experiences than for eLearning, but it can still be done.

Ways of providing feedback:

- Personalized written feedback on assignments and projects
- Detailed rubrics outlining both positive and negative feedback
- Use peer-evaluation assessments

In this study students must be given feedback after they have been evaluated.

8. ASSESS PERFORMANCE

Test if the lesson has been learned. Also sometimes give general progress information in the context of the whole course (retrieval).

Recall, or remembering, is the ultimate way to learn. When you try to remember something, your brain replays a similar pattern of neural activity that you already experienced. The more practice you have at remembering this information, the more solidified this similar pattern becomes.

Assessments are the formal way to test learner recall. This helps learners understand what they already know, and what they need to spend more time learning. Assessments also capture important learning data to help us as designers improve future instruction.

Ways of assessing performance:

- Include pop quizzes
- Use written exams
- Assess often throughout the course

In both Medical and Nursing education assessing performance should be done using both formative (progressive) evaluation and also summative (final) evaluation.

9. ENHANCE RETENTION AND TRANSFER

At the end of your instruction, learners need to be able to apply their knowledge to real-world situations. Give examples of similar problems or situations, provide additional practice. Put the learner in a transfer situation and get them to review the training materials (generalization). Make sure you spend plenty of time allowing learners to practice themselves.

This step is arguably the most difficult of all of Gagne's events.

Methods of enhancing retention:

- Use real-world scenarios
- Build in time for real-world practice
- Interactive eLearning activities
- Allow for flexible learning opportunities (such as mobile access)
- Continually use examples of real-world situations

The Medical and Nursing students are usually given assignments to do to enhance retention of what they have learned in the lecture rooms.

CONCEPTUAL FRAMEWORK

ACADEMIC STAFF (FACULTY)

PHYSICAL PLANT:

- ✓ LECTURE ROOMS
- ✓ SCIENCE LABS
- ✓ SKILLS LABS
- ✓ COMPUTER LABS
- ✓ LIBRARIES

TEACHING RESOURCES I.e. ALL INSTRUCTIONAL MATERIALS INCLUDING:

- ✓ LAPTOPS
- ✓ LCD PROJECTORS
- ✓ SCREENS
- ✓ CHARTS
- ✓ WHITE

FINANCIAL RESOURCES FOR:

- ➢ STAFF SALARIES
- ➢ TEACHING RESOURCES
- ➢ TEXT BOOKS
- ➢ INTERNET
- ➢ COMPUTERS
- ➢ NEW LECTURE ROOMS

TIME AS A RESOURCE:

- ➢ LECTURERS' PUNCTUALITY
- ➢ STUDENTS' PUNCTUALITY
- ➢ STUDENTS' PRIVATE STUDY TIME

QUALITY ACADEMIC PRODUCT (GRADUATE)

QUALITY HEALTH CARE

Adapted from google images 2020

CHAPTER TWO

2. 0. LITERATURE REVIEW

This chapter discusses the literature related to the study. It comprises mainly of the teaching and learning resources that lecturers and students use in teaching and learning in and out of the classroom. It also addresses issues of adequacy of teaching and learning resources in the teaching environment.

2.1. TEACHING/LEARNING RESOURCES USED IN HEALTH EDUCATION

Teaching and learning resources are all items or combination of items which enhance teaching and learning. They are the backbone for teaching and training health care professionals (*Ngatia et al.,* 2009).

There are five main categories of teaching resources:

1. The first category is that of human resource which includes administrators, lecturers and support staff.
2. The second category includes teaching resources including projectors, books and periodicals (Quinn & Hughes, 2007).
3. The third category is physical plant or classroom space and also includes satellite campuses and practical facilities for students.
4. The fourth type is financial resources which includes capital budget and operating budget (Tappen, 2001).
5. The fifth type is time as a resource (O'Connell, 2014)

2.2. AVAILABILITY OF TEACHING RESOURCES

In order for effective teaching and learning to take place there has to be enough resources. Every teacher should aim at giving the best to his/her students in order to enable them to remember and practice what they have been taught.

Teaching and learning resources are the backbone for teaching and training health care professionals. They enhance acquisition of relevant knowledge and skills, facilitate the delivery of information and influence development of attitudes (*Ngatia et al.*, 2009).

Teaching resources for enhancing cognitive learning are divided into two main categories:

- Projected aids
- Non-projected aids

Examples of projected aids include the Overhead Projector (OHP), Kaleidoscopes, films, video cassettes and slides. These teaching aids are the ones commonly used Universities.

Non-projected aids include the chalkboard, white board, magnetic boards, pictures, Flipcharts, posters, handouts, flannel boards and 'the real thing' including food substance (*Amri et al.,* 2005). All these teaching resources enhance understanding of information which in Bloom's Taxonomy is in the cognitive domain. A very important teaching resource for health professionals is a skills lab. A skills laboratory is a learning resource centre that provides an environment for learning clinical skills where students can practice without jeopardizing patient care or provoking adverse effects. It reduces the difficulties experienced by students when they first encounter patients in wards and clinics and improves procedural skills (*Omaswa et al.,* 2014).

Teaching resources that enhance acquisition of skills and attitudes include the following:

- Manikins of different types including. adult male/female, child, baby doll etc.
- Different types of instruments including dressing forceps, dissecting forceps, artery forceps, retractors etc.
- Hospital beds and coaches, trolleys of different kinds Mayo's trolley, dressing trolley
- Trays of different kinds including catheterization tray, stitch-removing tray, the General set tray, delivery tray etc.
- Computers, printers and scanners

  All these resources help students to learn by doing things practically thus attaining proficiency in skill.

2.3 PERCEPTION ON ADEQUACY OF TEACHING RESOURCES IN TEACHING AND LEARNING

Every school and department should have enough teaching resources in order to facilitate students' learning. As the numbers of university students continue to grow rapidly there is need to also increase teaching resources so as to cater for them effectively.

Without appropriate teaching and learning materials, health care professionals encounter many problems in training and practice. Even when the materials are available there is need for periodic review and production of new ones (*Ngatia et al.,* 2009).

Instructional resources are not only expected to be available to sufficient levels to enable teaching and learning to properly take place. They should be adequate enough for utilization in teaching and learning (Igwe in Martin's Library, 2004)

A study done in Public Universities in Nigeria revealed that these Universities did not meet the minimum requirements by the commission in charge of higher education in that country due in inadequate resources (Osarenren & Irabor, 2012).

Another study done in colleges in Nigeria also showed there were inadequately equipped laboratories in some colleges and this deterred proper leaning of students (Onyesom & Chimazie, 2013).

Another study done in Rwanda revealed that insufficient resources compromised the effectiveness of classroom management and content delivery (Bizimana, 2014).

A research was done in two Public Universities in Kenya on challenges that the management encountered in teaching and learning of University students. The study revealed that Public Universities did not have enough teaching and learning resources, especially lecture halls, computers, textbooks and library space. Moreover, there was a problem of inadequate teaching staff (Mbirithi, 2013).

In Kenya a study conducted by *Likoko et al* in Western Kenya teachers' colleges showed that institutions were faced with challenges of teaching resources. The study identified lack of adequate facilities like libraries and instructional materials. This led to a negative impact on the quality of graduates produced (*Likoko et al.*, 2013).

2.4. CHALLENGES OF TEACHING RESOURCES IN TEACHING

The main challenges of teaching resources include their acquisition and maintenance.

Nagel (2013) observes that significant challenges that are preventing widespread implementation of teaching resources include the following:

- Reluctance on the part of administrators and teachers in sourcing new technology materials
- Lack of preparation by teachers
- Lack of support for funding
- Slow or no professional development of teachers on how to integrate new technologies into their classrooms
- Resistance to change with continued use of old traditional teaching methods.

2.5. HUMAN RESOURCE:

Human resource is very important in every working environment including academic environments. Academic institutions need administrators, teachers and support staff. The acquisition of qualified personnel is in any agency is critical for the establishment of, maintenance and growth of the organization. Therefore, active recruitment is important, and the attraction of qualified applicants is the first step in selection of personnel (Tomey, 1992). Lecturers are the main type of human resource that is engaged in teaching. (*Amri et al* 2005) describes the six tasks of a teacher as Planning, communication, providing resources, counselling, assessment and continuing self-education.

An ideal teacher should have the following characteristics: proper training in own subject, expert in teaching role, well organized and prepared (Quinn & Hughes, 2007).

2.6. TEACHING AND LEARNING AIDS

These are instructional materials or items that enhance acquisition of relevant knowledge and skills, facilitate the delivery of information and influence development of attitudes. Teaching aids helps the student to learn using more than one sense. The teacher who relies only on the spoken word to deliver the message is less effective than the one who uses several senses (multisensory approach). A multisensory approach improves retention of information (the ability to remember), which is vital in education (*Amri et al.*, 2005).

Learning Styles

Learning styles refer to theories that aim to account for differences in individuals' learning. The theories share the proposition that humans can be classified according to their 'style' of learning, but differ in how the proposed styles should be defined, categorized and assessed. A common concept is that individuals differ in how they learn. There are seven different learning styles that student s use during learning. These include the following:

Visual (spatial)

The Visual or Spatial Learner

A visual or spatial learner is a person who learns best if there are visual aids around to guide the learning process.

For example, someone who can learn best from diagrams, pictures, graphs would be a visual or spatial learner. These people tend to be technically-oriented and enter engineering fields.

An example of this type of learner would be a person who becomes a computer engineer or programmer. But, the best students are those that are visual or spatial

learners. Why? Because being proficient in programming and IT requires that you be a strong visual or spatial learner.

Almost everything having to do with computers is conceptual and so it relies on graphical or visual representations of components that can't actually be seen (e.g. bytes).

According to Leopold (2012), visual learners learn best when they see something, auditory learners prefer to process information through oral/aural modes and kinesthetic learners prefer to learn through activities that require total physical involvement. This is achieved through the use of teaching aids by the instructors.

Aural (auditory-musical)

An Aural Learner tends to remember and repeat ideas that are verbally presented

- Learns well through lectures
- Is an excellent listener
- Can reproduce symbols, letters or words by hearing them
- Likes to talk
- Enjoys plays dialogues, dramas
- Can learn concepts by listening to tapes
- Enjoys music
- Can repeat or fulfill verbal instructions

Verbal (linguistic)

The Linguistic Learner

The linguistic learner is one who learns best through linguistic skills including reading, writing, listening, or speaking.

Sometimes, it's a combination of these methods. So, for example, if a linguistic learner wanted to tackle a new skill, their best method of learning would be to read about it, then listen to an audio recording and take notes on it. Finally, concretizing it would require speaking about it and, possibly, writing about it extensively.

Not surprisingly, some of the best teachers and professors are linguistic learners. It's in the nature of the profession.

Physical (kinesthetic)

The Kinesthetic Learner

The Kinesthetic learner is a person that learns best by actually doing something

These people are also scientific in nature and must interact with objects in order to learn about them (or learn about them in the best way possible).

According to FamilyEducation.com, some of the most common kinesthetic-based jobs are those in the arts, manufacturing or creative fields like physical therapy, dancing, acting, farming, carpentry, surgery, and jewelry-making.

None of these careers could be done without "hands-on experience." Many of these jobs, with rare exception, are also trade professions that require an apprenticeship or shadowing.

Logical (Mathematical)

The Logical (Mathematical) Learning Style. If you use the logical style, you like using your brain for logical and mathematical reasoning. You can recognize patterns easily, as well as connections between seemingly meaningless content. This also leads you to classify and group information to help you learn or understand it.

Characteristics of the Logical-Mathematical Learning Style. People with logical-mathematical learning styles use reasoning and logical sequencing to absorb information.

They enjoy school activities such as math, computer science, technology, drafting, design, chemistry, and other "hard sciences.". Logical-mathematical learners prefer logical order in instruction and often work best in structured, organized environments. They have strong visual analysis, memory, and problem-solving skills.

They may need to work on seeing the big picture and systems thinking. People with logical-mathematical learning styles learn best when they're taught using visual materials, computers, statistical and analytical programs, and hands-on projects.

Social (Interpersonal)

In order to maximize the learning potential of the interpersonal learning style, here are some characteristics of social learners:

- They like to hang out with large groups of people
- They do well with study groups or any sort of collaborative activities
- They struggle working alone, especially on projects
- They are vocal and are not afraid to ask questions

Social learners love sharing their knowledge with others, but also love listening to their peers. Interpersonal learners are well known for their ability to “read” people and are sometimes called “people smart”. This unique ability helps them understand what goes around them. Use the links below to learn more about the interpersonal learning style.

Characteristics. Interpersonal learners are true ‘people persons’. They enjoy heading up committees, participating in group learning projects, and communicating with other students and adults. They enjoy school activities such as speech, drama, and debate teams.

Solitary (Intrapersonal)

A solitary learner, also known as an intrapersonal learner is someone who prefers learning on their own. These types of students are self-motivated, enjoy working independently, and learn best when working alone. Students who are solitary learners spend a lot of time in self-reflection and enjoy working on themselves (Diaz, 2018). Learning Tips for the Solitary Learner: Find a quiet, secluded spot to study; don't completely isolate yourself all the time. Don't be scared to ask another person for advice/help with a problem if you don't know how to solve it yourself. Keep a journal Link your work to your personal life, so you become more interested in your work. Without appropriate teaching and learning materials, health care professionals encounter many problems in training and practice (*Ngatia et al,* 2009). There are two main categories of teaching/ learning aids namely: projected and non-projected resources. Examples of projected aids include the LCD projectors, Overhead projectors, films, videos and slides. The use of the LCD projector goes hand - in - hand with the laptop which contains the information to be projected. Non-projected aids include the chalkboards, white boards and markers, pictures, flipcharts, posters, “the real thing” real substances, text books, journals, handouts, and flannel boards. A study done by (Ashaver & Igyuve 2013) in Nigeria revealed that the chalkboard is the only audio-visual material frequently used by lecturers, and that non-availability, lack of

supporting infrastructure and human factors are hindrances to the use of audio-visual aids in a college.

The use of internet is good development in innovative teaching where learner can search for information from different websites. They can also access e-journals and e-books from the e-libraries. Lecturers in distance education use the internet in blended learning in which case there is contact face to face teaching and e-learning when the student is away from the training institution (*Mutema et al,* 1999).

According to (Juma 2015), one of the challenges for establishing distance learning in Kenya is because lack of funds, inadequate library resources, slow internet connectivity and scarcity of computing resources (Juma, 2015).

According (Bataineh & Brooks (2003), the newest challenge is to use technology to individualize instruction in order to help students meet standards. Teachers should consider using technology to adjust content to students' individual learning styles in order to achieve this goal.

A study done by (Tarus 2015) on challenges of implementing e-learning in Kenyan Public Universities revealed that there was inadequate ICT and e-learning infrastructure which includes availability of network, internet connectivity, computer labs, financial constraints and lack of affordable and adequate internet bandwidth (*Tarus et al.,* 2015).

2.7. PHYSICAL PLANT

These include mainly classrooms, libraries, science laboratories, skills laboratories, hospitals, community agencies, field practical facilities and satellite campuses of the institution (*Mutema et al.,*1999). For educators to be successful, the availability of resources by students and faculty is important. Students who do not have access to learning spaces, resources and teachers will be at a disadvantage. The reality of limited

physical and economic resources in school settings demands the sharing of all available instructional resources (Tanner & Lackney, 2006). According to (Tanner & Lackney 2006), building designs should take into consideration the scale of the environment as it relates to the developmental needs and capabilities of the learner. The design should consider building systems that promote health by maintaining good indoor air quality, thermal conditions, natural lighting and acoustical quality.

A study done by (Gudo 2011) on issues of quality education in private and public Universities revealed that public Universities did not have adequate physical facilities and other teaching resources for offering services to their students (*Gudo et al*, 2011).

2.8. FINANCIAL RESOURCES

The main financial resources include capital budget and operating budget. A capital budget refers to money set aside for buying assets which include equipment and other supplies that will last for a year or more. The budget for these purchases must come from cash on hand to qualify as capital budget expenditures (Johnston, 2015:). In the training of health professionals, capital budgets would be used for procuring equipment for Science labs and Skills labs. This equipment will range from tables, coaches, beds, trolleys, manikins, instruments, BP machines, electrocardiogram machines, drip stands, projectors etc.

Operating budgets refer to the money that is set aside to cover day-to-day expenses. This includes wages, rent, utilities and purchases of items that are intended to last less than a year (Johnston, 2015). In the training of health professions operating budgets would be used for paying lecturers' salaries, buying chalk, whiteboard markers, paying for electricity and water and transport expenses. Operational budgets are also used for the maintenance of assets that are purchased using the capital budget.

A study conducted by *Mosomi et al* concluded that financial constraints hindered tutors from being trained on the utilization of modern learning and teaching resources (*Mosomi et al.*, 2014).

The Kenyan Daily Nation Newspaper of Wednesday March 14, 2015 wrote that 16 Public Kenyan Universities were experiencing deep financial crisis and therefore the quality of education they were offering was questionable. (Wanzala, 2015).

2.9. TIME AS A RESOURCE

Time is an organizations most valuable resource (O'Connell, 2014). It is a very important resource for both the teacher and the student. The teacher needs to plan adequate teaching for planning for teaching and time for actual teaching of students. On the other hand, students need to plan for classroom lessons plus time for assignments and other activities. Teachers who don't prepare adequately for their students do not delivery quality teaching to the people who they are training.

According to (Taylor 2015), proper time management increases productivity. Time management process involves the following steps:

- Setting goals
- Prioritizing the goals
- Deciding how much time to allocate to specific tasks
- Adjusting plans as things change
- Revisiting the goals and priorities regularly
- Observing results

(Shipman 2018) feels that the critical skills for time management are:

- Being aware of yourself - your habits and ways of working

- Structuring your time
- Setting goals and priorities
- Increasing personal efficiency and effectiveness
- Scheduling specific time for each activity
- Scheduling relaxation time in order to regenerate

2.10 TYPES OF TEACHING METHODS IN HEALTH EDUCATION

There are two main types of teaching methods in medical education:

1. Traditional teaching methods
2. Innovative teaching methods

2.10.1. Traditional Teaching Methods

Traditional teaching methods are the methods of teaching that have been used since the history of medical education began. They include the following methods:

- Lecture method
- Demonstrations
- Role play
- Practicals/Lab work
- Field practice
- Clinical practice
- Simulations
- Team teaching (*Ngatia et al.*, 2009)

Lecture Method:

Lecture method is the oldest method of teaching. It is based on the philosophy of idealism. This method refers to the explanation of the topic to the students. The emphasis is on the presentation of the content.

A lecture (from the French *lecture*, meaning reading) is an oral presentation intended to present information or teach people about a particular subject, for example by a university or college teacher. Lectures are used to convey critical information, history, background, theories, and equations. A politician's speech, a minister's sermon, or even a businessman's sales presentation may be similar in form to a lecture. Usually the lecturer will stand at the front of the room and recite information relevant to the lecture's content.

Though lectures are much criticized as a teaching method, universities have not yet found practical alternative teaching methods for the large majority of their courses. Critics point out that lecturing is mainly a one-way method of communication that does not involve significant audience participation but relies upon passive learning. Therefore, lecturing is often contrasted to active learning. Lectures delivered by talented speakers can be highly stimulating; at the very least, lectures have survived in academia as a quick, cheap, and efficient way of introducing large numbers of students to a particular field of study.

Lecture method is most convenient and inexpensive method of teaching any subject. It hardly requires the use of scientific apparatus, experiment, and aids materials except for the black board. Lecture method is teacher controlled and information centered approach in which teacher works as a role resource in classroom instruction. In this

method, the only teacher does the talking and the student is passive listens. This creates dullness in the classrooms as the interaction between the pupil and teacher ceases to occur.

In the field of education, lecture method is used very frequently. This method is used in order to acquire knowledge and concept. Lecture method mainly focuses on cognitive objectives. The main emphasis of this strategy is the presentation of the content. In this method teachers plans and controls the whole teaching – learning process. To make the lecture interesting, the teacher can take the help of audio -visual aids.

The following are the basic advantages of the lecture method: It provides an economical and efficient method for delivering substantial amounts of information to large numbers of student. It affords a necessary framework or overview for subsequent learning, e.g., reading assignments, small group activities and discussion. The power of the lecture method is difficult to explain. Traditionally those who are most knowledgeable are the ones who lecture. Lecture has become synonymous with teaching. Lecture has been synonymous with the knowledgeable person standing up and telling knowledge to the recipient of knowledge, a student symbolically sitting down and receiving the knowledge.

This mindset can be seen even among experts who are practicing modern innovative teaching/ learning methods. Good example of this is Moi University School of Medicine which is partly a target of this study. This University is advertised as an innovative University using methods which are innovative as has been alluded to severally in this study. Such innovative methods include; SPICES, PBL, COBES, Electives, CAS, among others. And yet despite this comprehensive declaration lecture

method still finds way among these innovative methods. The way lecture method finds its way here is by educators giving excuse that it is only being used as either, "Introductory lecture," or "Overview lecture" and even as, "Illustrated lecture." This is how powerful the lecture method is.

Maybe it can be concluded here that for a long time to come, the lecture method will be difficult to get rid of and perhaps the best way will be to look for methods which will make it most beneficial for student learning. For the purpose of this study at doctoral level, it can be proposed that one way of making the lecture method as useful and powerful as possible is to use the very old skills that had been practiced extensively in the 1970s and 1980s best known as, "micro teaching skills." Those skills included set- induction, reinforcement, stimulus- variation, use of illustrations and examples, questioning and closure. Appropriate use of this skills ensure that the learners are awake and can participate during the lecture.

Disadvantages of the lecture

- Lectures fail to provide instructors with feedback about the extent of student learning.
- In lectures students are often passive because there is no mechanism to ensure that they are intellectually engaged with the material.

Demonstrations

A demonstration is the process of teaching someone how to make or do something in a step-by-step process. As you show how, you "tell" what you are doing.

A demonstration is a presentation that shows how to perform an act or procedure, or how to use a piece of equipment, or how to communicate with patients and personnel. Nursing instructors frequently use a lecture-demonstration technique, in which the

introductory explanation is in the form of a short lecture, followed by the demonstration itself. Sometimes the presentation is best done by a team, the demonstrator, who carries out the procedure, and a commentator, who explains what is being done. Demonstration provides a concrete, realistic learning experience that by its nature commands attention. It has the advantage of using visual as well as oral perceptions, thus facilitating learning. Other senses may also be used such as smell or touch. For example, placing a learner in a turning frame and turning him helps him appreciate how the patient feels when being turned.

The demonstration provides a common experience for all the learners, giving a basis for discussion to reinforce the learning. Demonstrations can be used for individual or group teaching. They also have the advantage of providing a n opportunity to learners to sharpen their observational skills.

Teacher demonstrations are important because they:

- Provide students with experiences of real events, phenomena and processes, helping them learn.
- Raise students' interest and motivation in learning
- Enable you to focus students on a particular phenomenon or event, such as the starch test for foods.

Steps of the Demonstration Method

1. Planning and preparation. proper planning is required for good demonstration
2. Introducing the lesson. The teacher should motivate students and prepare them mentally for the demonstration

3. Presentation of subject matter
4. Demonstration
5. Teaching Aids
6. Evaluation

Advantages of Demonstration

- It helps in involving various sense to make learning permanent.
- Though, teacher behavior is autocratic, he invites the cooperation of pupils in teaching learning process.
- It develops interest in the learners and motivates them for their active participation.

Disadvantages of Demonstration

- Good Demonstrators are not easy to find.
- The demonstration method is restricted to only certain kinds of teaching situations.
- The "Result" type of demonstration may take considerable time and be rather expensive.
- Demonstration may require a large amount of preliminary preparation.

  As we discuss this area of demonstration the current state of system reveals that institutions in Kenya and indeed the world are being called upon to take more and more students to accommodate the increasing populations.

  Medical professions require very meticulous training to ensure that those who graduate do not do harm. Where teaching by demonstration is done it is important for those who are being trained to see exactly how the demonstration is being carried out. With increasing number of students in classrooms, laboratories, bedsides in hospital wards, only students in the front line can clearly see what the teacher, doctor, or demonstrator

is doing. The consequence of this, is that some students' may actually graduate without ever having seen or followed through a vital procedure and yet when these students graduate and especially in our Kenyan situation they may be posted to distant health facilities where they may be the only experts that communities depend on. In such situations, the graduate may be called upon to carry out a lifesaving procedure about which he/ she is unprepared.

This above example illustrates how important a simple method such as demonstration is.

Role play

Role-play is a technique that allows students to explore realistic situations by interacting with other people in a managed way in order to develop experience and trial different strategies in a supported environment.

A role play area is a fun and a 'playful' activity but also a key component in students' learning. It is a social space that develops speaking and listening skills, as well as giving students the opportunity to reflect on and develop their knowledge of a topic, whilst sparking and enhancing creativity and imagination.

Research shows that role play can change attitudes and behaviours. It can be useful as it allows employees to build confidence, practice skills they are learning and develop problem-solving solutions.

Role plays although an important teaching learning method it requires, in modern interpretation, careful planning. If a role play is well planned, organized and carried out, it can facilitate tremendous learning. As mentioned above learning by role play can be so powerful that it can change people's attitudes. One quick example of this is

enabling a rude nurse to play a role of an HIV positive patient and organizing the role play in such a way that the nurse experiences the pain and humiliation that the patient goes through when handled by nurses in general. When such role play is carried out correctly, the trainee nurse becomes committed to treat not only HIV patients but other patients appropriately.

In additional to the above consideration, role play must the done properly to avoid embarrassing and humiliating the student outside the planned teaching learning experience. Above this, it must be planned such that the students do not get hurt during the role plays

Practicals or Lab work

Practical method of teaching as defined by prince (2004) is a learning method in which students are engaged in the learning process. First, active role of students and second, collaboration among students. The word teaching means to impact knowledge or values in an individual.

With practice-based learning, you combine theory and work experience with a strategic, reflective process throughout the duration of your learning. You implement the theory in the classroom as you learn it, assess its effectiveness and revisit your initial framework according to what's useful in reality.

Laboratory teaching assumes that first-hand experience in observation and manipulation of the materials of science is superior to other methods of developing understanding and appreciation. Laboratory training is also frequently used to develop skills necessary for more advanced study or research.

Laboratory method or activity method leads the students to discover mathematical facts. It is based on the principal of learning by doing, learning by observation and proceeding from concrete to abstract. It is only an extension of the inductive method.

Key skills for laboratory technicians

- Independence.
- Meticulous attention to detail.
- Excellent written and oral communication skills.
- Good team working skills.
- Analytical skills.
- Time management.

Clinical experience provides supervised opportunities for observing, teaching, and reflecting on the teacher's role in the classroom and school settings.

Clinical teaching is time limited process whereby the teacher and student create an established partnership with in a shared environment in such a way that the teacher's primary, operational frame of reference is maintained as the legitimate means for affecting students' behavior towards intended purpose

Research has shown that students who engage in well-designed laboratory experiences develop problem-solving and critical-thinking skills, as well as gain exposure to reactions, materials, and equipment in a lab setting.

Laboratory work and demonstrations described above are very similar. Laboratory work seeks to emphasize what goes on in actual laboratory settings. It is usually assumed that laboratory refers to medical laboratories which handle, laboratory

equipment, microscopes, chemicals, reagents, and pathological materials do be investigated. These suggest that laboratories are actually dangerous places. Staff and students can contract deadly diseases from these laboratories and so be a danger to not only themselves but to their colleagues and to the communities at large. Despite having said all these, laboratory methods are a great and useful teaching/ learning methods.

What is Field-Based Learning?

In field-based learning, teaching is extended to a site outside of the classroom or laboratory, exposing students to a real-world setting.

What is field work method of teaching?

Directly involving students in responsibility for learning: fieldwork requires that students plan and carry out learning in an independent manner. Developing and applying analytical skills: fieldwork relies on a range of skills, many of which are not used in the classroom.

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The importance of field study

For students, field studies create opportunities for first-hand experiences that encourage critical thinking, long-term retention, transfer potential, positive attitudes towards science, appreciation for nature, and increased scientific curiosity.

Three types of qualitative field research methods are described here that focus on capturing lived experiences:

- Direct Observation.
- Participant Observation.
- Qualitative Interviews.

What makes a good field trip?

- A well-designed field trip can bring it all together: combine two or more subjects while offering a variety of learning styles and intelligences, integrate the arts, encourage low-income and English language learner students to make connections between community resources and opportunities and their family and culture.

Benefits of Fieldwork

- Promotes better understanding. Fieldwork is highly beneficial as it helps to promote better understanding of geography.
- Develops skills. Fieldwork helps to develop vital skills in the students.
- Promotes cultural understanding.
- Enjoyable experience.

Advantages & Disadvantages of Field Trips

- Enhances the Curriculum. One of the biggest advantages to field trips is that they allow students to have a real-world experience
- New Learning Environment: field trips also allow the students to learn outside of the classroom.

- Team Building
- Planning
- Liability

Disadvantages

- It may lack breadth; gathering very detailed information means being unable to gather data from a very large number of people or groups.
- It may be emotionally taxing.
    - Documenting observations may be more challenging than with other methods.
    - Budget restraints, lack of chaperons, difficulty controlling student behavior, organizing an engaging lesson and dealing with anxious children are potential challenges.
    - Establishing rules, soliciting support and proper planning can alleviate many of the disadvantages of taking a field trip.

    Field trips are a power teaching method if they are planned properly. From a single field trip to a relevant and appropriate site a student can determine his/ her own life career. If a field trip is meaningful and enjoyable short of determining one's career it can be a good stimulus variation from the boring school-based teaching methods. The adage is change is as good as rest. Traditional field trips are a waste time. They are poorly planned, lacking in objectives and when students are out there, they do nothing more than spend time away from school. In some cases, students may experience many unplanned and unintended consequences of being out in the field.

Simulations

Simulations are instructional scenarios where the learner is placed in a "world" defined by the teacher. They represent a reality within which students interact. The teacher controls the parameters of this "world" and uses it to achieve the desired instructional results. A simulation is a form of experiential learning.

Simulated teaching is an artificially arranged teachers training technique which helps the student teachers to learn the art and techniques through role playing. The dictionary meaning of simulation is the act or process of pretending or role playing.

Simulation tools can track student progress and provide standardized feedback that can aid in developing skills. They can also offer targeted skill development: students can choose which skills to improve on and receive specific training resources, and educators can also control the content.

How to Conduct a Simulation:

- Describe the possible outcomes.
- Link each outcome to one or more random numbers.
- Choose a source of random numbers.
- Choose a random number.
- Based on the random number, note the "simulated" outcome.
- Repeat steps 4 and 5 multiple times; preferably, until the outcomes show a stable pattern.

Five Steps of conducting a Simulation

1. Step 1: Decide on the purpose of the simulation and what performance metrics you want to monitor. Very rarely will you need to simulate your entire class.

2. Step 2: Build a first Pass Simulation.
3. Step 3: Calibrate Your Simulation.
4. Step 4: Analyze the Results and Select the Best Alternative.
5. Step 5: Share Your Simulations.

Summary

Simulations provide opportunities to extend and enhance the practice, feedback, and assessment provided during teacher education. A simulation is a simplified but accurate, valid, and dynamic model of reality. A simulation allows users to encounter problem situations, test decisions and actions, experience the results, and modify behavior cost-effectively and without risking harm. Simulations may or may not be implemented using digital technologies but increasingly take advantage of them to provide more realism, flexibility, access, and detailed feedback. Simulations have many advantages for learning and practice, including the ability to repeat scenarios with specific learning objectives, practice for longer periods than are available in real life, use trial and error, experience rare or risky situations, and measure outcomes with validated scoring systems. For skills development, a simulation's outcome measures, combined with debriefing and reflection, serve as feedback for a formative assessment cycle of repeated performance practice and improvement.

Simulations are becoming more common in preservice teacher education for skills such as lesson planning and implementation, classroom management, ethical practice, and teaching students with varying learning needs.

Team teaching

Team teaching involves a group of instructors working purposefully, regularly, and cooperatively to help a group of students of any age learn. They share insights, argue with one another, and perhaps even challenge students to decide which approach is better.

Characteristics of Team Teaching:

- The team-teaching method is flexible.
- In team teaching, teachers need to decide their activities by themselves.
- It is a collective responsibility.
- In team teaching, the whole responsibility is on all the teachers.
- The requirements of pupils, schools and other things also considered.

Types of Team Teaching

Team teaching includes a number of different approaches. Some of the more common are

- Interactive team teaching – two faculty members present in front of the class simultaneously.
- Rotational format team teaching – faculty alternate teaching the class. This rotational format has a number of variations depending on the subject matter and the number of faculty involved.
- Participant-observer team teaching – all participating faculty are present for all the classes, but only one is “teaching” at a time. Roles that the other teachers

could play as participating observer(s) are model learner, observer, panel member, or resource (Klein, 1990).

- Team coordination – faculty arrange and integrate a curriculum so as to maximize learning and connections using paired or linked courses, an integrated cluster of independent courses, or freshman interest groups (McDaniels and Colarulli, 1997). Though not necessarily team teaching per se, this curriculum-level approach to interdisciplinary can help to achieve some of the expected gains of team teaching.

Benefits of Co-Teaching

Co-teaching allows more opportunities for small group and one-to-one learning, and stronger modeling during lessons. The co-planning process encourages two teachers to bounce ideas off each other in order to deliver the strongest, most creative lessons.

In the experience of Moi University College of Health Sciences which is a target of this study, every year when new students arrive for both undergraduate and postgraduate degree programmes, a good example of team teaching is demonstrated when an entire department, now section, of medical education brings together the five members of faculty to teach all students from the entire college the innovative methods used at the college. During the week long or two-week long training session not only do the faculty members take turn to teach, but they respond to students concerns and questions each according to their preference and specialization area.

2.10.1.2 Skills taught to students using traditional methods

These skills are known as micro-teaching skills and should be applied in a specific sequence as follows:

1. Set Induction
2. Reinforcement
3. Stimulus variation
4. Questioning
5. Use of examples and illustrations
6. Closure

2.10.2 **Innovative (Modern) Teaching Skills**

The following are the recommended innovative (modern) methods that are also in use for teaching medical education students:

- S.P.I.C.E.S (Student-Centred, Problem-based, Integrated, Community-oriented, Electives, Systematic)
- Problem Based Learning (PBL)
- COBES (Community-Based Education and Services (COBES)
- Small group tutorials
- Computer Assisted Instruction (CAI)
- Self-Directed Learning (SDL)
- Independent Study
- Projects
- Case study

- Electives (*Mutema et a.,* 1999)

Innovative education uses computerized applications and international networks that includes the following:

- Use of CD ROMS
- Computerized (Programmed) instructions
- Internet/worldwide web/e-mail systems
- International medical education computerized journal subscription
- Health net
- Use of informatics
- Telemedicine
- Advanced technology – application courses
- Correspondence/distance learning courses
- Educational exchange programmes
- Teleconferencing (*Mutema et al*., 1999).

2.10.3. Skills used in Teaching using Innovative Methods

A teacher using innovative methods of teaching should use the following steps in instructing students:

- Facilitate
- Advise
- Guide
- Inform
- Participate
- Withdraw

2.10.4. FUTURE TEACHING METHODS IN MEDICAL EDUCATION

These methods are not currently in use but are anticipated methods of the future. They include the following methods:

- The PRISMS model
- Zero-face-to-face Learning
- Online e-learning
- Tele/video Conferencing
- Planned audio/video packages
- Blended learning
- Print self- instructional packages supported by tutorials
- Distributed learning materials (at study centers)
- Distance learning (traditional)
    - Increased use of Skills Labs (Online)

CHAPTER THREE

3. RESEARCH METHODOLOGY

3.1. INTRODUCTION

This chapter deals with research methodology which includes the research design, study setting, the population of study, sampling methods, data collection procedures and data analysis.

3.2. STUDY DESIGN

The research design that was employed in this study was mixed methods. Mixed methods research design is a procedure for collecting, analyzing and 'mixing' both quantitative and qualitative research and methods in a single study to understand a research problem (Creswell and Clark, (2007) in Creswell, 2008. The basic assumption is that the use of both quantitative and qualitative methods in combination provides a better understanding of the research problem and questions than either method by itself (Creswell, 2008).

The mixed method design encompasses both quantitative and qualitative research designs for the enrichment of a study (Creswell, 2008).

Quantitative research is a formal, objective, systematic process in which numerical data used to obtain information about the world. This research method is used to describe variables, examine relationships among variables and determine cause-effect interactions between variables (Burns & Grove, 2005). Quantitative research method holds the assumption of the world view (philosophy) of Post-positivism which focuses on determination, reductionism, empirical observation and measurement, and theory verification (Creswell, 2011).

The type of quantitative research design that was used was the descriptive study design. A descriptive study is designed to gain more information about characteristics within a

particular field of study. Its purpose is to provide a picture of the situation as it naturally happens. A descriptive design may be used for the purpose of developing theory, identifying problems with current practice, justifying current practice, making judgements or determining what others in similar situations are doing (Burns & Grove, 2005).

Qualitative research on the other hand is a systematic, interactive, subjective approach used to describe life experiences and give them meaning (Burns & Grove, 2005). Data collection methods in qualitative study design are mainly open-ended interviews. These could be in form of focus groups, telephone interviews and face-to-face interviews.

Qualitative research supports the world view (philosophy) of social constructivism which holds the assumption of understanding, multiple participant meanings, Social and historical construction and Theory generation (Creswell 2011). The type of qualitative study that was used in this study was phenomenological study design. The purpose of Phenomenological research is to describe experiences (phenomena) as they are lived. This means that the researcher studies the'lived experience' of study participants (Burns & Grove, 2005).

3.3. PHILOSOPHY OF THE RESEARCH

This research is based on the pragmatism worldview. This is a problem-centered pluralistic method of collecting data. It is real world practice oriented with consequences of actions. It is a world view that arises out of actions, situations and consequences rather than antecedent conditions. Instead of focusing mainly on research methods researchers focus on the research problem and use all approaches available to understand the problem (Creswell, 2011). Pluralistic approaches are used to derive knowledge about the problem. The four main assumptions of this philosophy are that

there are consequences of actions, it is problem-centered, it is pluralistic (uses more than one method) and is real-world practice oriented (Creswell, 2011).

The quantitative part of research is based on the philosophy of Post-positivism which is also called the scientific method or conducting science research. It reflects the need to identify and assess the causes that influence outcomes such as in experiments (Creswell, 2011).

The qualitative part of this study is based on the philosophy of the social constructivist world view. The goal of research under this view is to rely as much as possible on the participants' views on the situations being studied. The questions are broad and general so that the participants can construct the meaning of a situation, typically done in discussions or interactions with the researcher or other persons. The researcher listens carefully to what people say or do in their life settings (Creswell, 2011)

3.4. STUDY SETTING

This study was conducted in two Public Universities namely: Moi University (University A) in Uasin Gishu County and University of Nairobi (University B) in Nairobi County. These two Universities were selected for the study because they are among the first Universities to offer the two programmes in Kenya. In these two Universities data was collected in the Colleges of Health Sciences specifically in the Schools of Medicine and Nursing i.e. in the MBChB and BScN programmes.

3.5. STUDY POPULATION

The study population comprised mainly of lecturers and students from the School of Medicine and School of Nursing in the two Universities. The study participants

comprised mainly of lecturers in MBChB and BScN programmes. The total population of lecturers in this study, from both Universities, was five hundred and fifty-five (555). Lecturers from Moi University in the School of Medicine at the time of the study were one hundred and ninety (190) and those from University of Nairobi School of Medicine were 320. The number of lecturers in Moi University in the School of Nursing was twenty-two (22) while in the School of Nursing in University of Nairobi was twenty-three (23). These statistics were obtained in November 2017.

The population of study for students was a total of 3,488 students in the two Universities and the two Schools. Moi University had 509 MBChB students and 212 BScN students, while University of Nairobi had 2,017 MBChB students (including Module 1 and 2) and 750 BScN students. There were obviously higher student numbers in University of Nairobi as compared to Moi University.

Inclusion criteria: The lecturers had to be full time employees of the University in which they worked and who understood the entire system of their University in order to qualify to participate in the study. The students' representatives had to be registered students of the University during that particular trimester.

Exclusion criteria: Part-time lecturers and hospital staff who taught in the Universities were not engaged in the study. Non-registered students in the Universities were also not allowed to participate in the Focus Group Discussions.

3.6. SAMPLING METHODS

Sampling of the participants employed convenience sampling for the quantitative part of the study. Convenience (accidental) sampling was used as a non-probability method of sampling and involved readily available people or objects for the study

(Nieswiadomy, 2010). In convenience sampling, available subjects are simply entered into the study until the desired sample size is reached (Burns and Grove, 2005).

The reason why the researcher chose convenience sampling is because lecturers in health care education are few in number and use of other sampling methods like random sampling would not have worked because they would lead to a very small sample size.

A sample size of 50 lecturers was selected from each University to participate in the study i.e. 28 from Schools of Medicine and another 22 from the Schools of Nursing (Nursing Schools have fewer lecturers than Medical Schools).

For the qualitative part of the study, the researcher used purposive sampling to select subjects for the study. Purposive sampling also referred to as judgmental sampling or selective sampling is the conscious selection of certain subjects or elements to include in a study (Burns & Grove, 2005).

The sampling criteria for Focus Group Discussions was by picking two students' representatives from each class of the MBChB and BScN programmes. These students were engaged in four Focus Group Discussions (FGDs) in their separate programmes.

A focus group interview is the process of collecting data through interviews with a small group of people, typically four to six (Creswell, 2008). The advantage of this approach is that it is a time saver compared to individual interviews.

A total of 38 students were selected from both Universities to participate in the study. There were 20 students from Moi University and eighteen (18) students from University of Nairobi. The reason for the difference in numbers was that Moi University had MBChB programme ending in sixth year and University of Nairobi had the same programme running up to fifth year.

This sampling criteria was to ensure that every class was represented in the FGDs.

3.6. RESEARCH INSTRUMENTS

3.6.1. Questionnaire

Data collection was done using closed-ended structured questionnaires for quantitative data and an interview schedule (guide) for qualitative data. The drop and pick method was used to administer the structured questionnaires to the lecturers. The researcher personally distributed the questionnaires but had assistants who helped to collect the questionnaires.

A questionnaire is a research instrument consisting of a series of questions (or other types of prompts) for the purpose of gathering information from respondents. A research questionnaire is typically a mix of close-ended questions and open-ended questions. Close-ended questions structure the answer by only allowing responses which fit into pre-decided categories. Open-ended, long-form questions offer the respondent the ability to elaborate on their thoughts. An interview schedule or guide is basically a list containing a set of structured questions that have been prepared, to serve as a guide for interviewers, researchers and investigators in collecting information or data about a specific topic or issue. The interview guides normally contain open-ended questions (Kothari, 2004).

Most important, it is a memory aid to ensure that the interviewer covers every topic and obtains the necessary detail about the topic. For this reason, the interview guide should contain all the interview items in the order that you have decided.

3.6.2. Instrument Validity and Reliability

A pilot study was conducted in Maseno University in the School of Medicine and School of Nursing to test the study instruments that were later used in the main research. This was done to ensure instrument validity and reliability. Validity of the instrument

concerns its ability to gather the data that it is intended to gather. Instrument reliability refers to its consistency and stability in the study (Nieswiadomy, 2010).

3.6.3 Focus Group Discussions

The researcher conducted four Focus Group Discussions (FGDs) with Medical students and Nursing students from the Schools of Medicine and Nursing respectively in the two Universities. A focus group discussion is the process of collecting data through interviews with a group of people. (Creswell, 2008). This constituted the qualitative part of the study where an open-ended interview guide was used. A total of 38 students were interviewed in the two Universities.

Each discussion took 30-40 minutes with the respondents sitting in a circle together with the researcher. Each Focus Group consisted of 8 - 10 students who were interviewed. The data obtained was coded before analysis was done.

3.7. ANALYSIS FOR QUANTITATIVE DATA

All the quantitative data was collected using self- administered closed-ended questionnaires and data was analyzed using SPSS version 21 data analysis package.

3.7.1 Data entry

The data obtained from the research was analyzed as follows: All the data collected from the research participants was coded. The researcher worked on two main types of data from the quantitative part of the study which includes descriptive and inferential statistics.

Inferential analysis was used to draw conclusions and generalizations concerning the relationship and differences found in research results. Some of the inferential statistics

that were used included t-test, ANOVA (F-test), Chi-square test and regression analysis (*Serem et al, 2013*).

3.8 ANALYSIS FOR QUALITATIVE DATA

Qualitative data was obtained by recording the interviews from Focus Group Discussions using digital audio tapes. The researcher listened to the audio tapes, data was coded, transcribed into a transcript and then analyzed contextually (Creswell, 2008). The transcript was then summarized and put into context. After this, ideas were organized into patterns and trends that constituted five emerging themes.

3.9 DATA PRESENTATION

Descriptive statistics were illustrated in form of frequency tables, linear graphs, bar graphs and pie charts. Inferential statistics were calculated using chi-square and Analysis of variance to test significance.

3.11 ETHICAL CONSIDERATIONS

The researcher sought permission to conduct the research from the Institutional Research Ethics Committee (IREC) in Moi University by submitting an abstract and completed research proposal for scrutiny. Permission was also sought from the National Commission for Science, Technology and Innovation (NACOSTI) to allow for data collection in Uasin Gishu and Nairobi Counties. The researcher also requested to conduct the study from the administration of the two public Universities. In University of Nairobi permission to conduct the study was sought from the DVC - Research,

Production and Extension, Principal of the college of Health Sciences, the Dean: School of Medicine and the Director of the School of Nursing.

This research did not involve any experimentation on human beings and therefore no harm was inflicted on participants. There were also no benefits for the participants since this study was purely academic in nature.

All the participants signed an informed consent that explained all that the study entailed plus their role as participants. They were informed that they could withdraw from the study when they no longer wanted to continue with it.

3.12. THE FINDINGS

After analyzing the data, the researcher documented the findings as observed in the study process. From the findings, the researcher was able to make conclusions that contributed to generalization of some of the findings. Various recommendations were made that will be sent to the two Public Universities to address issues on improvement of utilization of teaching/learning resources.

3.13. DISSEMINATION OF THE FINDINGS

The research findings were reported mainly through the thesis and will also be presented in seminars and conferences. These findings will also be published in some popular journals in order to ensure more people can access the study report.

CHAPTER FOUR

4.0 DATA ANALYSIS AND INTERPRETATION

4.1 INTRODUCTION

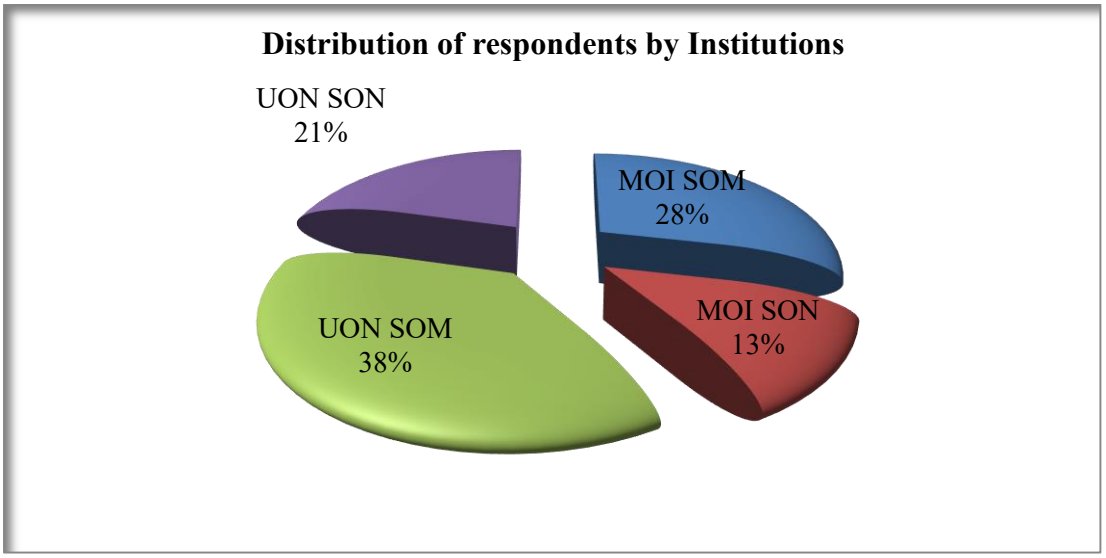
This chapter provides the findings of both quantitative and qualitative data. Part one provides findings from quantitative data and part two findings from qualitative data.

4.2 FINDINGS FROM QUANTITATIVE DATA

4.1.0 Objective 1:

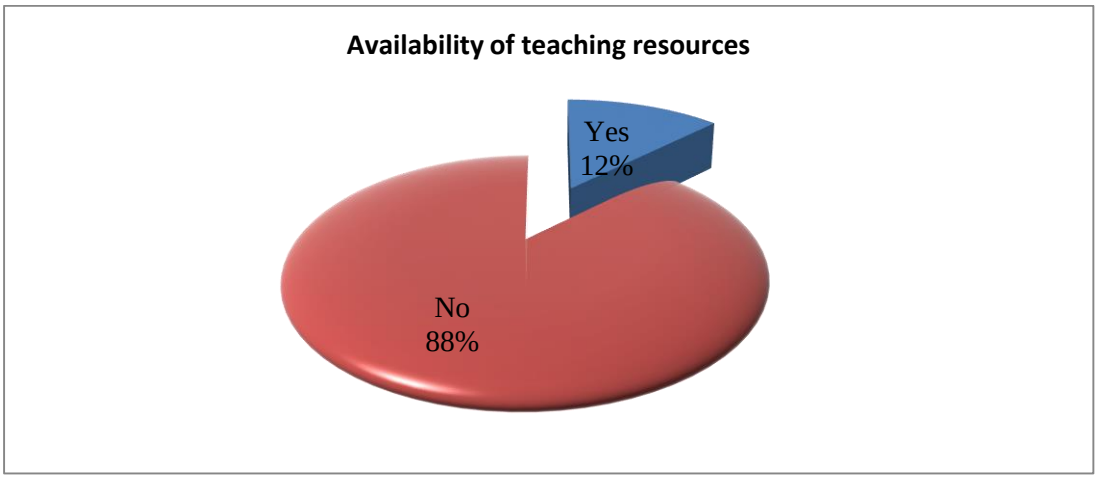
To assess the perceptions of adequacy of teaching resources in the MBChB and BScN Programmes by Lecturers in the two Public Universities.

Figure 1: Distribution of respondents by Institutions



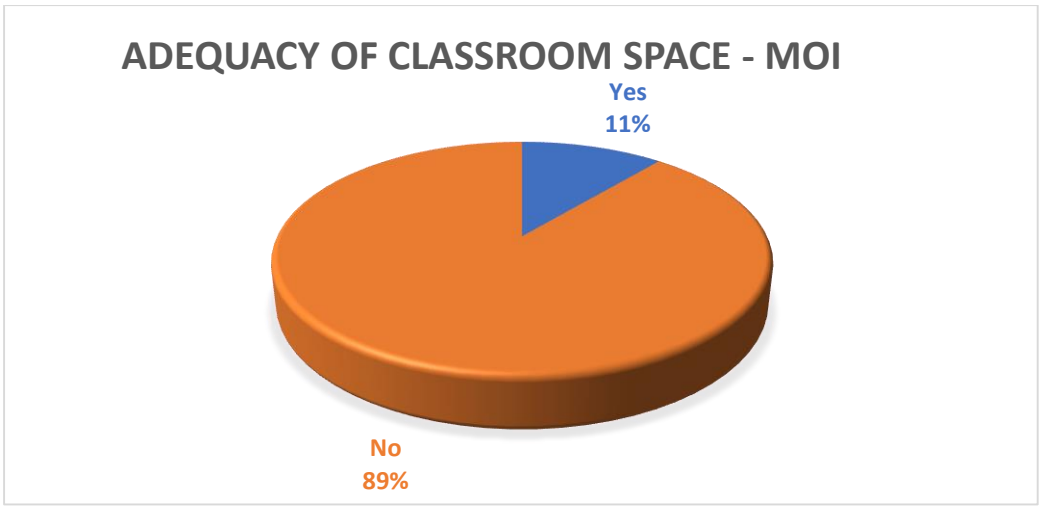
The highest number of participants were from the School of Medicine in UoN at 38% and the lowest number of respondents from the School of Nursing in Moi University.

Figure 2: Availability of teaching resources in both Universities



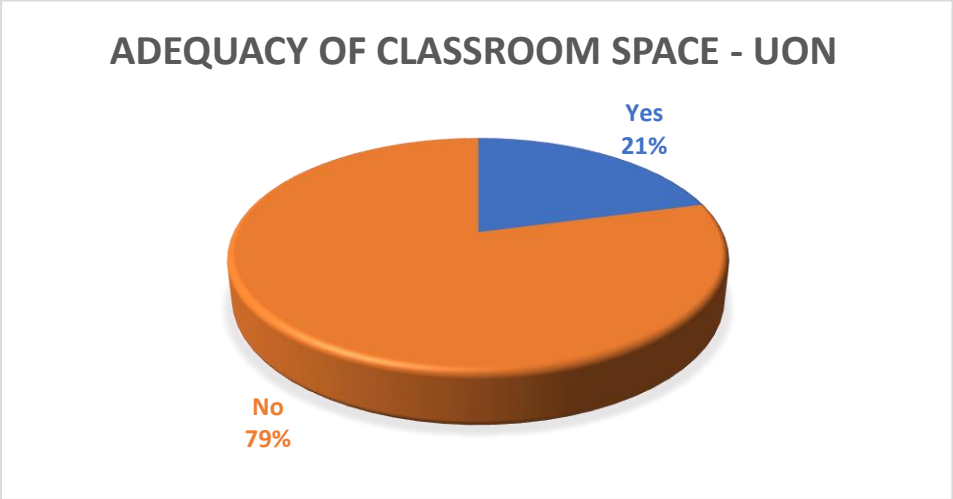
Most lecturers from the two Universities perceived that teaching resources were not available at 88%.

Figure 3: School of Medicine MU



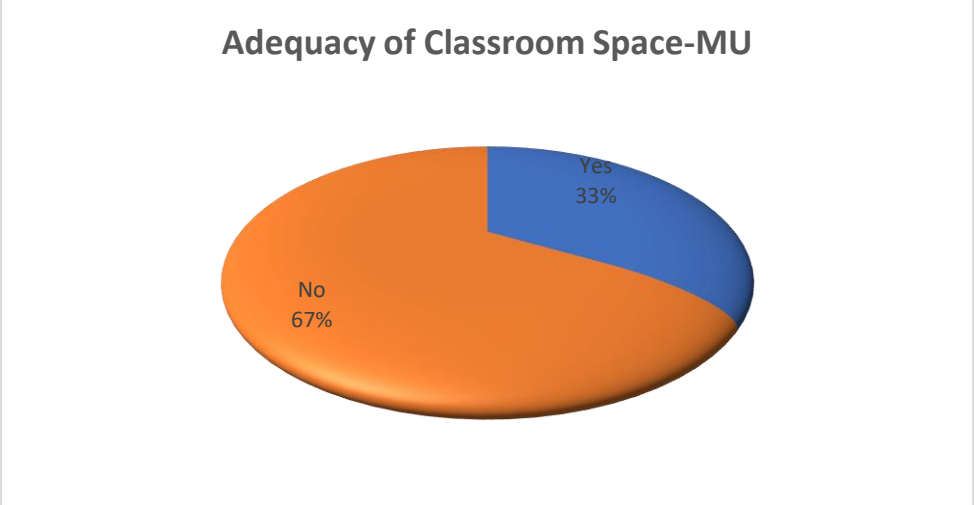
Majority of lecturers (89%) from Moi University School of Medicine perceived inadequacy of classroom space

Figure 4: School of Medicine UoN



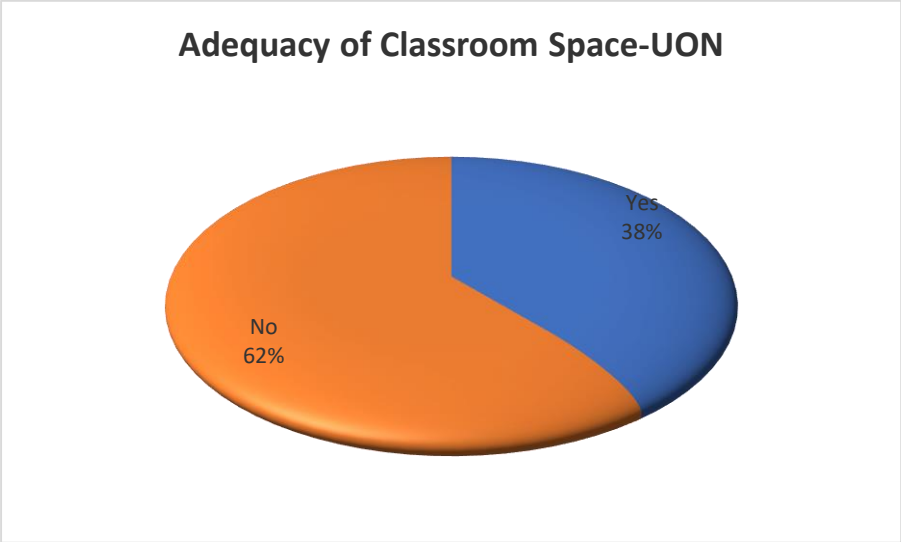
Majority of the lecturers (79%) in UoN School of Medicine perceived inadequate classroom space

Figure 5: School of Nursing MU



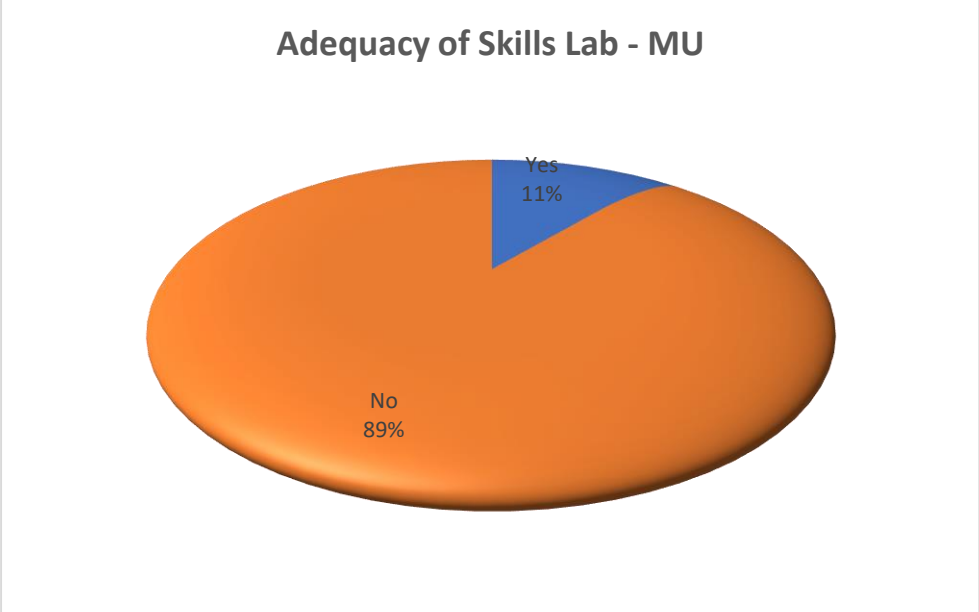
67% of lecturers from Moi University perceived inadequacy of classroom space.

Figure 6: School of Nursing UoN



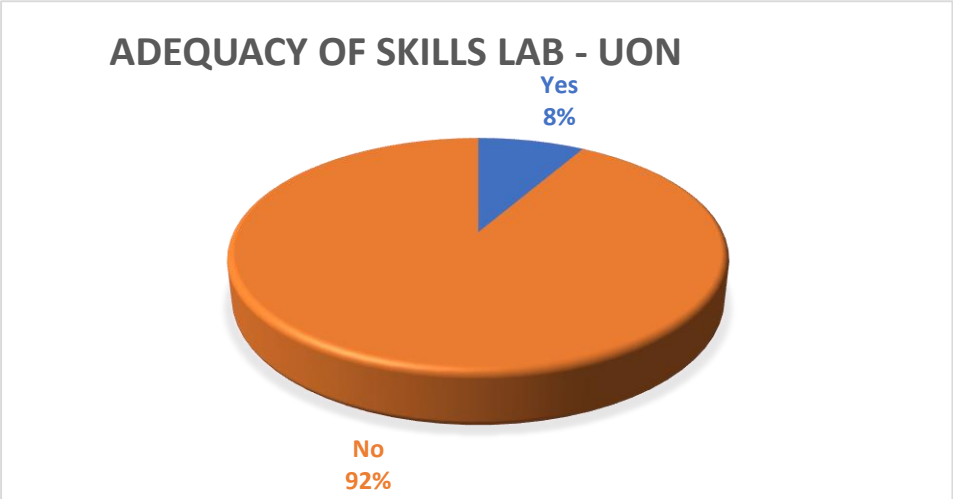
Most of the lecturers (62%) from UoN School of Nursing perceived inadequacy of classroom space.

Figure 7: School of Medicine MU



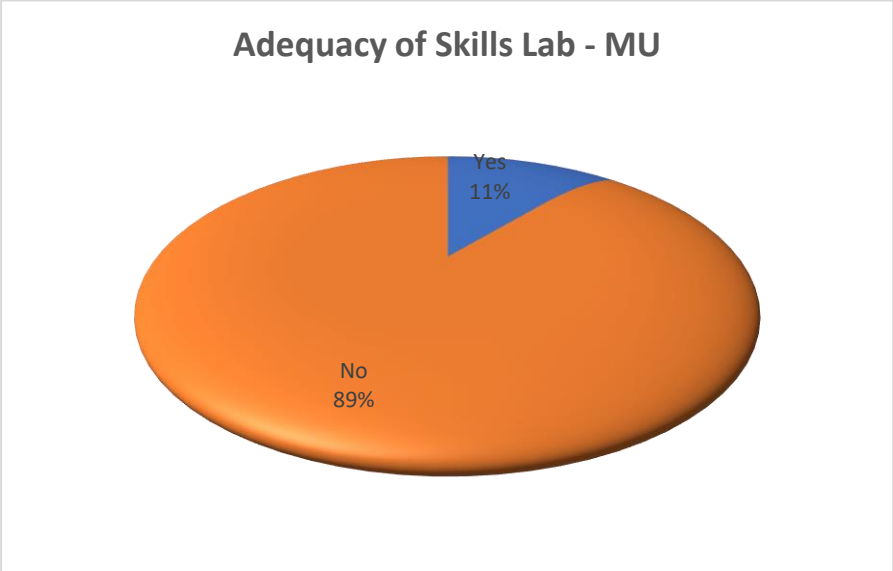
89% of the lecturers perceived inadequacy of skills lab space

Figure 8: School of Medicine UoN



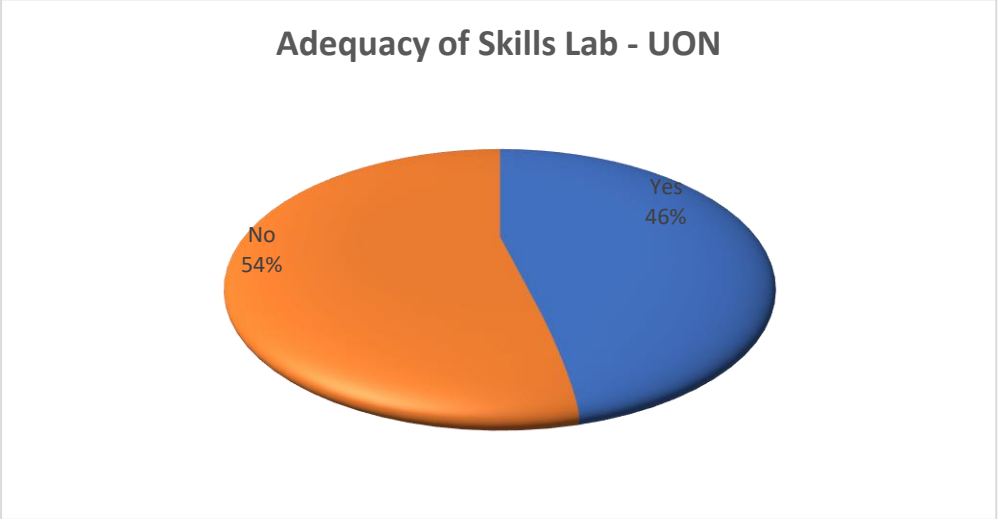
92% of lecturers in Medical school perceived inadequacy of skills labs

Figure 9: School of Nursing Moi Iniversity



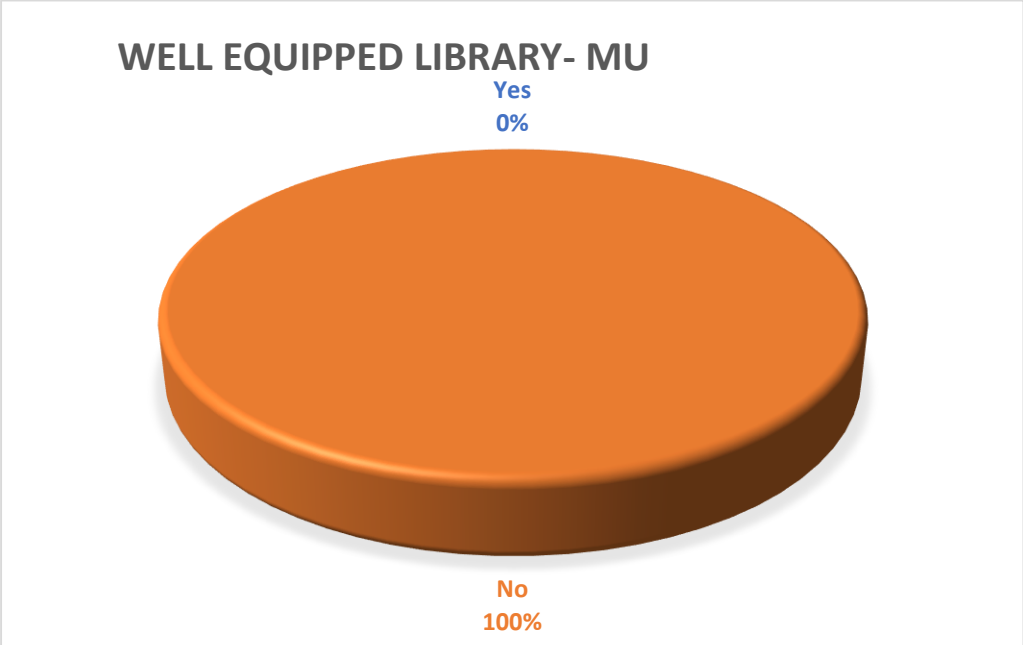
89% of lecturers from Moi University School of Nursing perceived inadequacy of skills lab

Figure 10: School of Nursing UoN



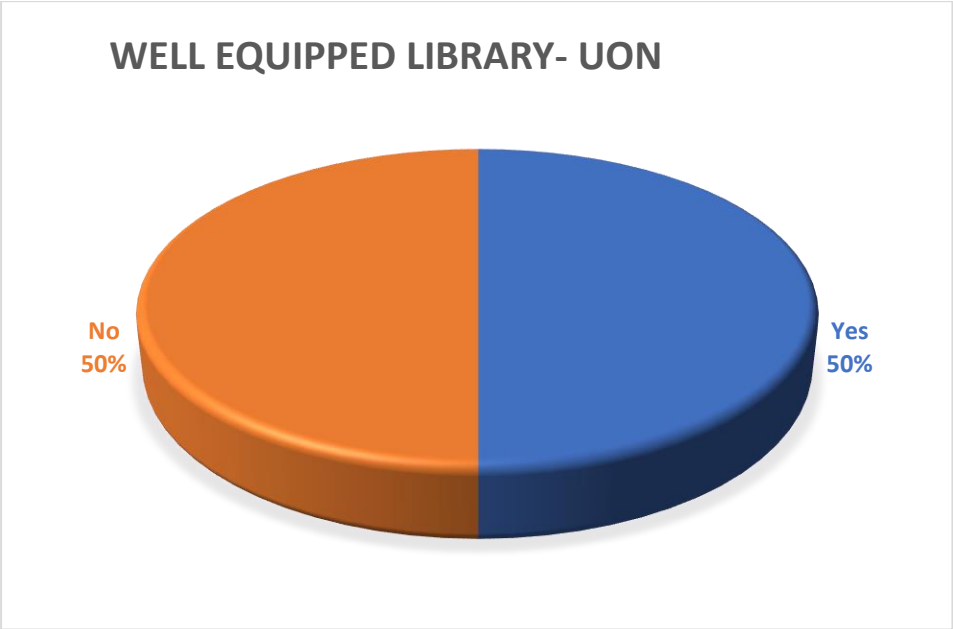
54% of lecturers from the school of Nursing in UoN perceived inadequacy of the skills lab

Figure 11: Schools of Medicine MU



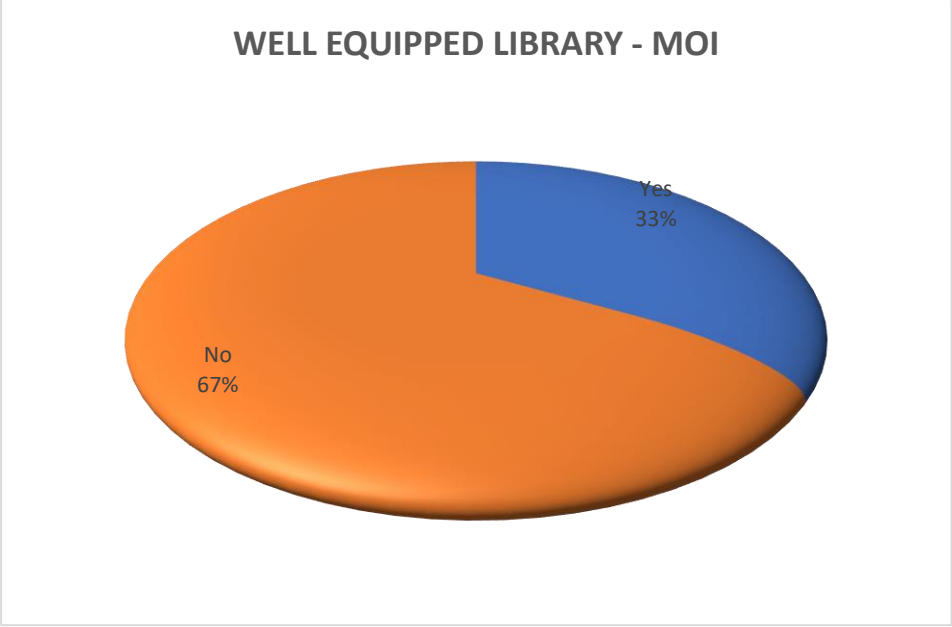
All respondents (100%) SOM stated that the library was not well equipped in Moi University

Figure 12: School of Medicine UoN



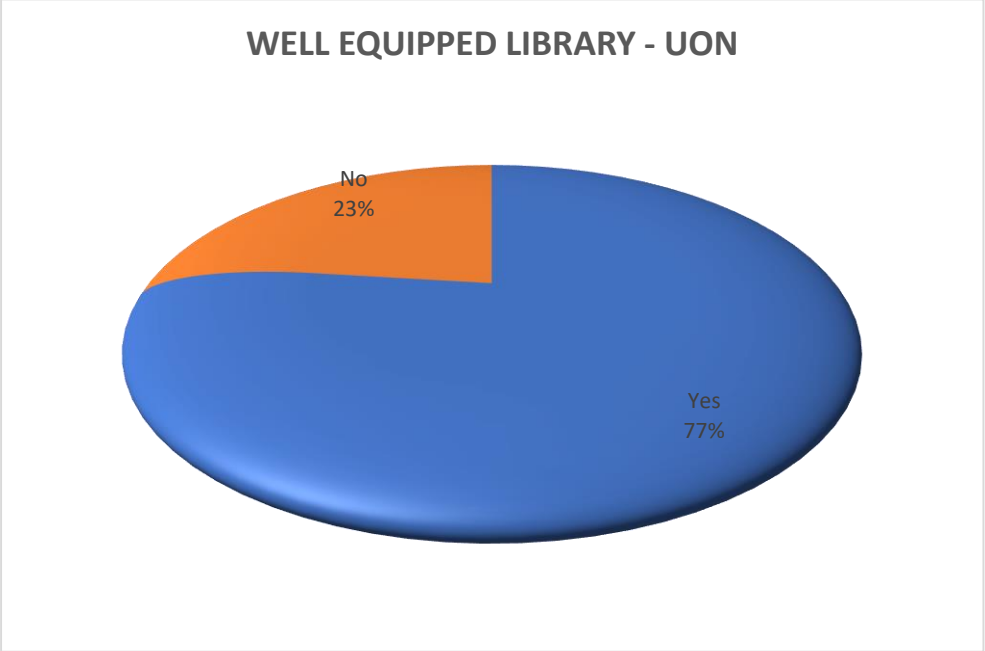
Lecturers in UoN School of Medicine were divided 50% by %50% on the equipping of the library. This divided opinion did not reflect the data by the students.

Figure 13: School of Nursing



67% of the lecturers from Moi University school of Nursing perceived a well - equipped library. This perception was not accurate as compared to other analyzed data.

Figure 14: School of Nursing UoN



A total of 77% of Nursing lecturers from UoN perceived a well-equipped library. This tallied well with the students' findings.

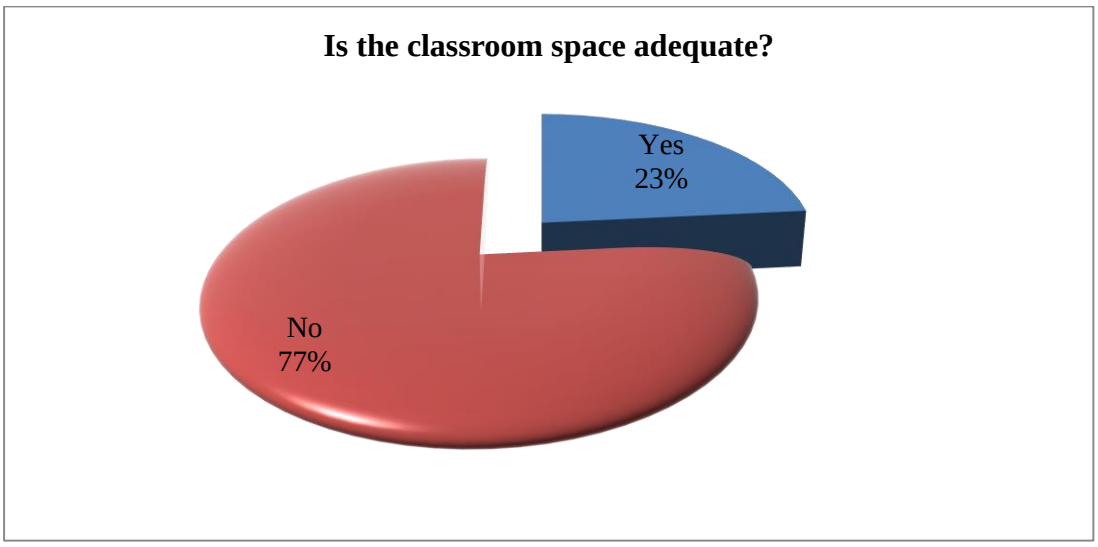
COMBINED DATA ANALYSIS FROM THE TWO PUBLIC UNIVERSITIES

Table 1: Adequacy of Classroom space

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	15	23.4	23.4	23.4
	No	49	76.6	76.6	100.0
	Total	**64**	**100.0**	**100.0**	

76.6% of lecturers from both University perceived that classroom space was inadequate when compare to the number of students

Figure 15: Adequacy of classroom space



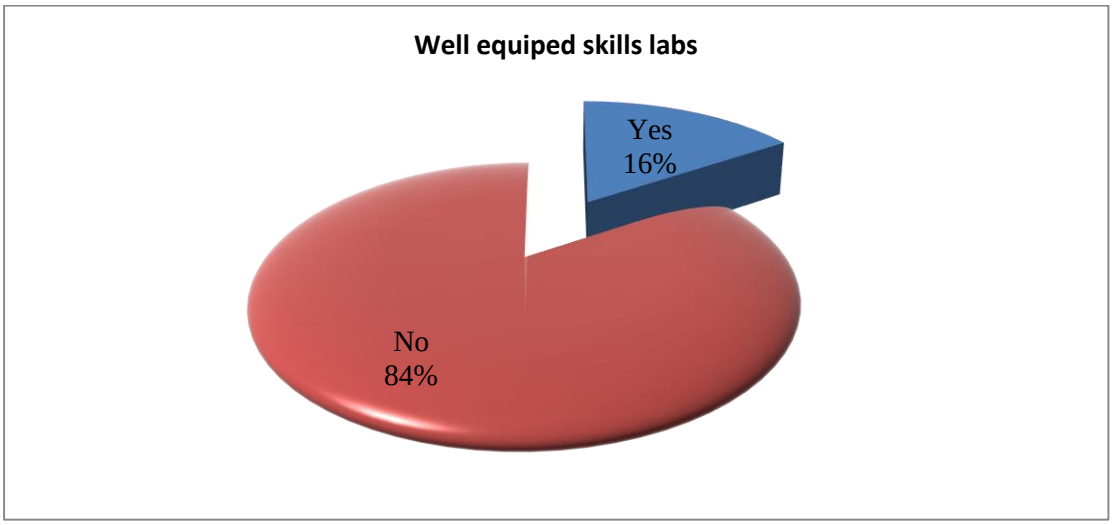
Same information as the above table 1

Table 2: Adequacy of all the instructional materials that are required for teaching in the classroom

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	12	18.8	18.8	18.8
	No	52	81.3	81.3	100.0
	Total	**64**	**100.0**	**100.0**	

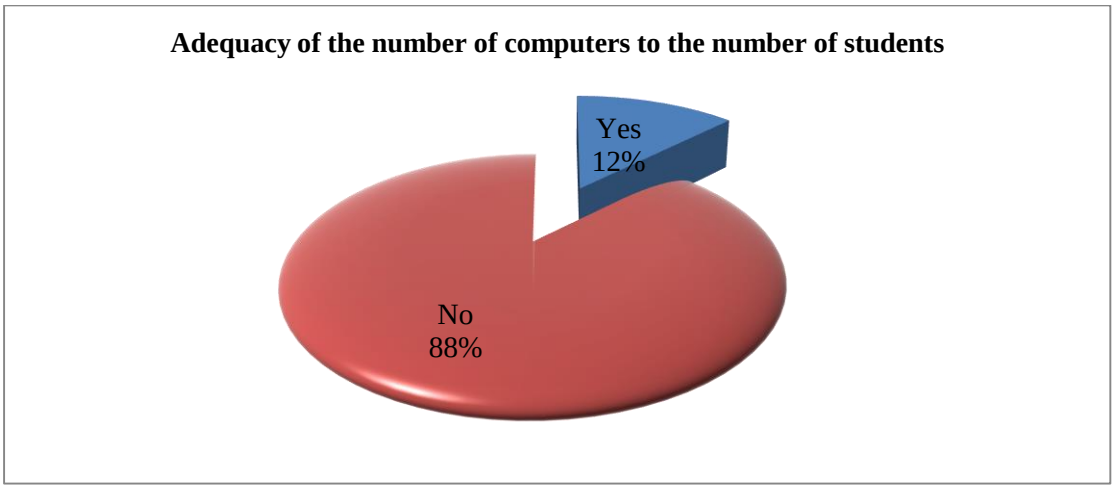
Majority of the lecturers from both Universities (81.3%) felt that they did not have enough instructional materials.

Figure 16: Well-equipped skills labs in both Universities



84% of lecturers from both Universities perceived that their skills labs were not well equipped

Figure 17: Adequacy of the number of computers to the number of students



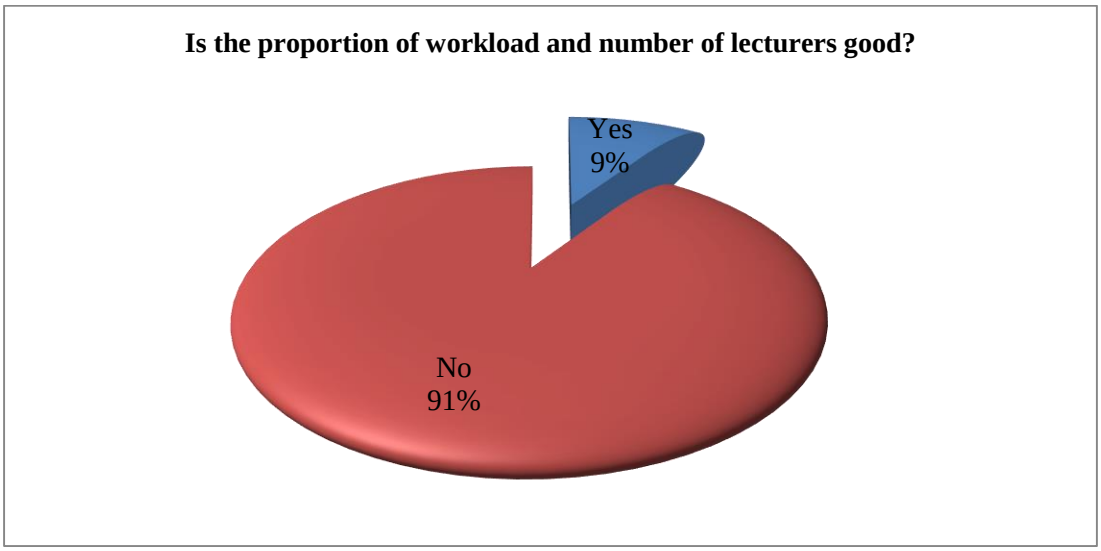
Most lecturers from both Universities felt that students did not have enough computers at 88%

Table 3: Reliability of internet connectivity in the school for both lecturers and students

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	25	39.1	39.1	39.1
	No	39	60.9	60.9	100.0
	Total	**64**	**100.0**	**100.0**	

60.9% of lecturers from both Universities felt that internet connectivity was not reliable.

Figure 18: Is the proportion of workload and number of lecturers good?



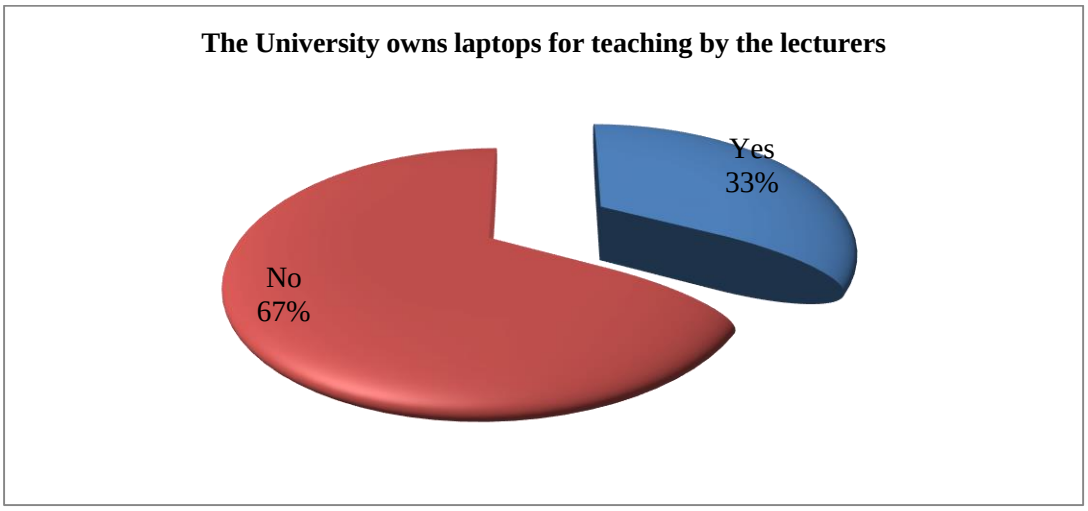
In both Universities, 91% of lecturers felt that the proportion of workload was not good as compared to the number of lecturers

Table 4: Every lecturer can access an LCD projector whenever they have a class to teach

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	27	42.2	42.2	42.2
	No	37	57.8	57.8	100.0
	Total	**64**	**100.0**	**100.0**	

Most lecturers (57.8%) from both Universities could not have access to a projector whenever they had a class to teach.

Figure 19: The University owns laptops for teaching by the lecturers



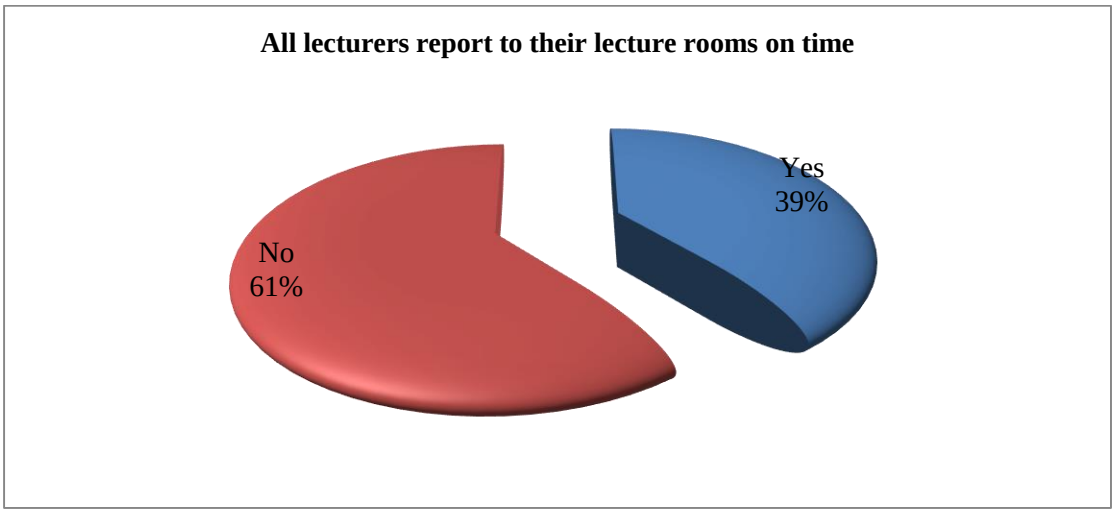
Majority of the lecturers (67%) perceived that the Universities did not have laptops for lecturers to be used for teaching.

Table 5: Our University receives teaching equipment and other materials from donor NGOs

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	34	53.1	53.1	53.1
	No	30	46.9	46.9	100.0
	Total	**64**	**100.0**	**100.0**	

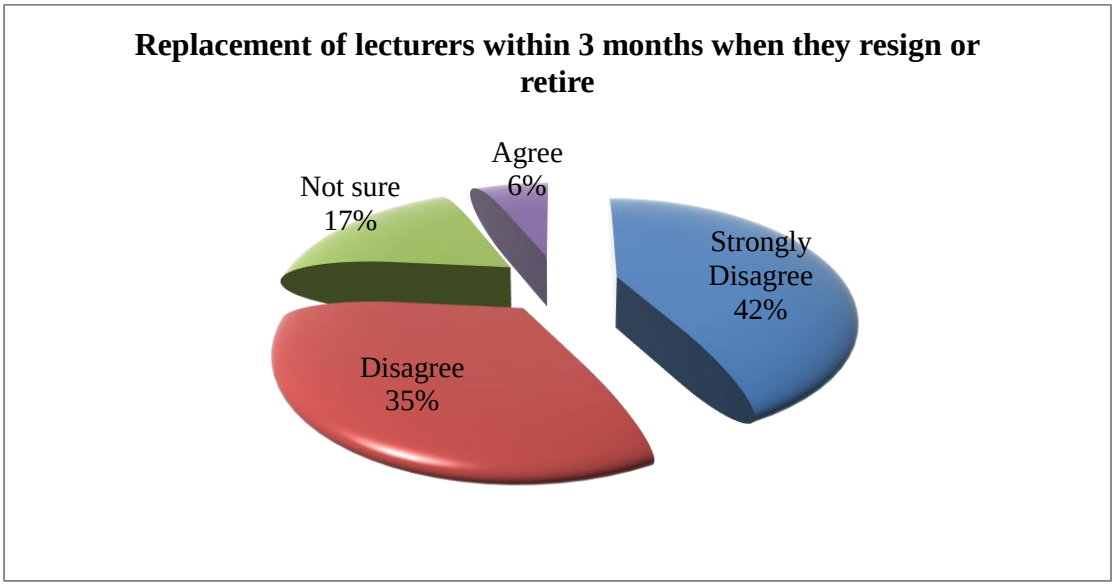
53.1 % of the lecturers perceived that their Universities received equipment and other materials from NGOs.

Figure 20: All lecturers report to their lecture rooms on time



61% of lecturers from both Universities believe that lecturers do not report to their lecture rooms on time.

Figure 21: Replacement of lecturers within 3 months when they resign or retire



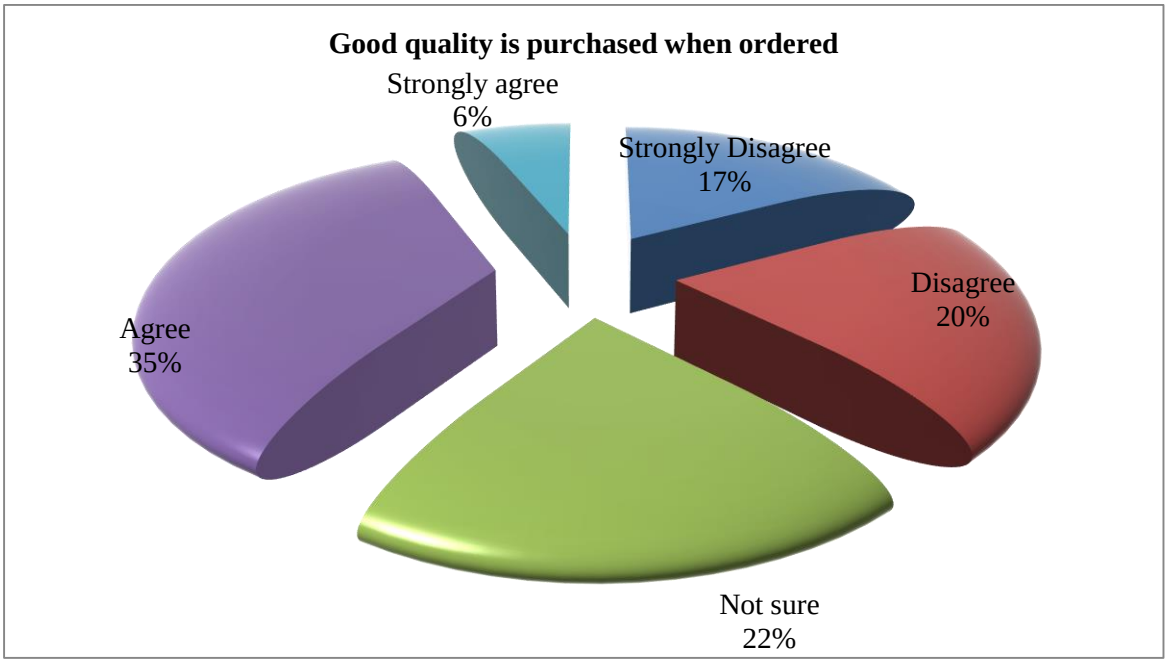
Majority of the lecturers (77%) (42% + 35%) disagreed that lecturers are replaced within 3 months when they leave.

Table 6: When replacing lecturers, it is very possible to get a person with teaching experience at University level

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	14	21.9	21.9	21.9
	Disagree	17	26.6	26.6	48.4
	Not sure	12	18.8	18.8	67.2
	Agree	15	23.4	23.4	90.6
	Strongly agree	6	9.4	9.4	100.0
	Total	**64**	**100.0**	**100.0**	

Majority of the lecturers (48.5%) disagreed (21.9 + 26.6%) that when replacing lecturers, they have teaching experience at University level.

Figure 22: Good quality is purchased when ordered



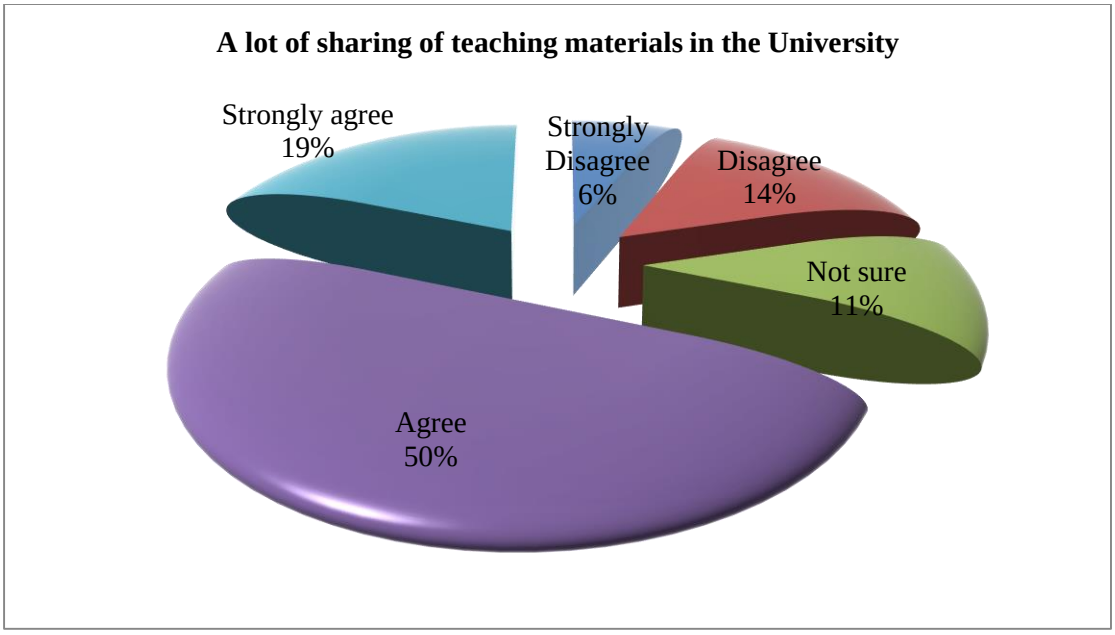
Majority of the lecturers 41% (6%+35%) agree that good quality equipment is purchased when ordered

Table 7: The process of obtaining signatures in the procurement process of teaching materials is long and tedious

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	4	6.3	6.3	6.3
	Disagree	9	14.1	14.1	20.3
	Not sure	14	21.9	21.9	42.2
	Agree	20	31.3	31.3	73.4
	Strongly agree	17	26.6	26.6	100.0
	Total	**64**	**100.0**	**100.0**	

Most of the lecturers at 58% (31.4+ 26.6%) felt that the procurement process of teaching materials is long and tedious.

Figure 23: A lot of sharing of teaching materials in the University



Lecturers perceive that there is a lot of sharing of teaching materials in their Universities at 69% (19% + 50%).

Figure 2: Sharing of teaching materials does not inconvenience any lecturer because there is proper prior planning of use

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	13	20.3	20.3	20.3
	Disagree	27	42.2	42.2	62.5
	Not sure	11	17.2	17.2	79.7
	Agree	12	18.8	18.8	98.4
	Strongly agree	1	1.6	1.6	100.0
	Total	**64**	**100.0**	**100.0**	

Majority of lecturers from both Universities are inconvenienced by sharing of teaching materials at 62.5% (20.3% + 42.2%).

Figure 24: Sharing lecture rooms does not inconvenience any lecturer

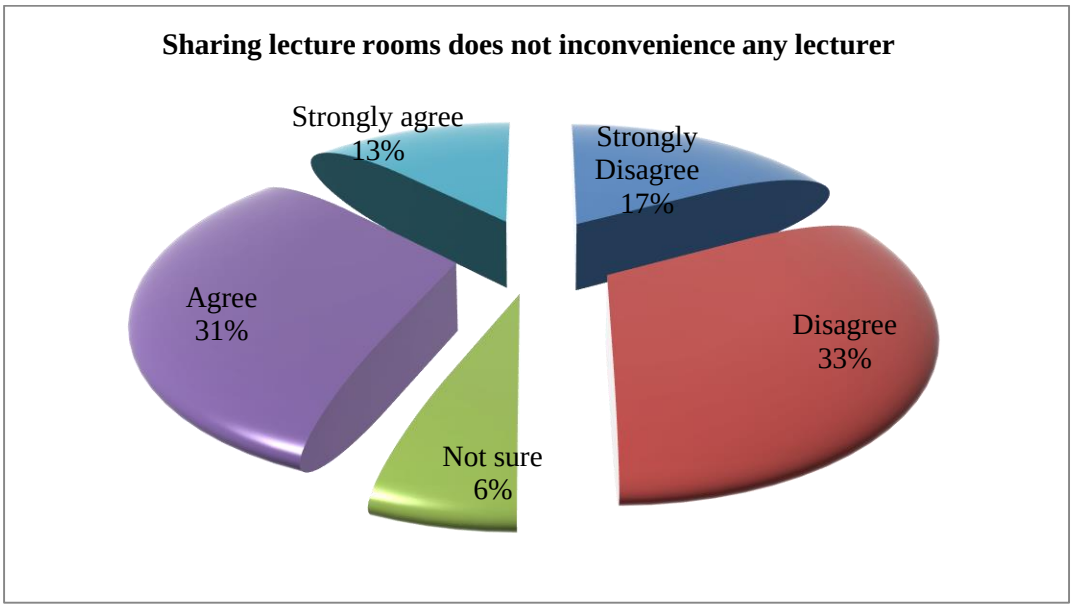


Table 8: Internet connectivity for lecturers and students is reliable and efficient throughout the trimester

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	15	23.4	23.4	23.4
	Disagree	25	39.1	39.1	62.5
	Not sure	6	9.4	9.4	71.9
	Agree	15	23.4	23.4	95.3
	Strongly agree	3	4.7	4.7	100.0
	Total	**64**	**100.0**	**100.0**	

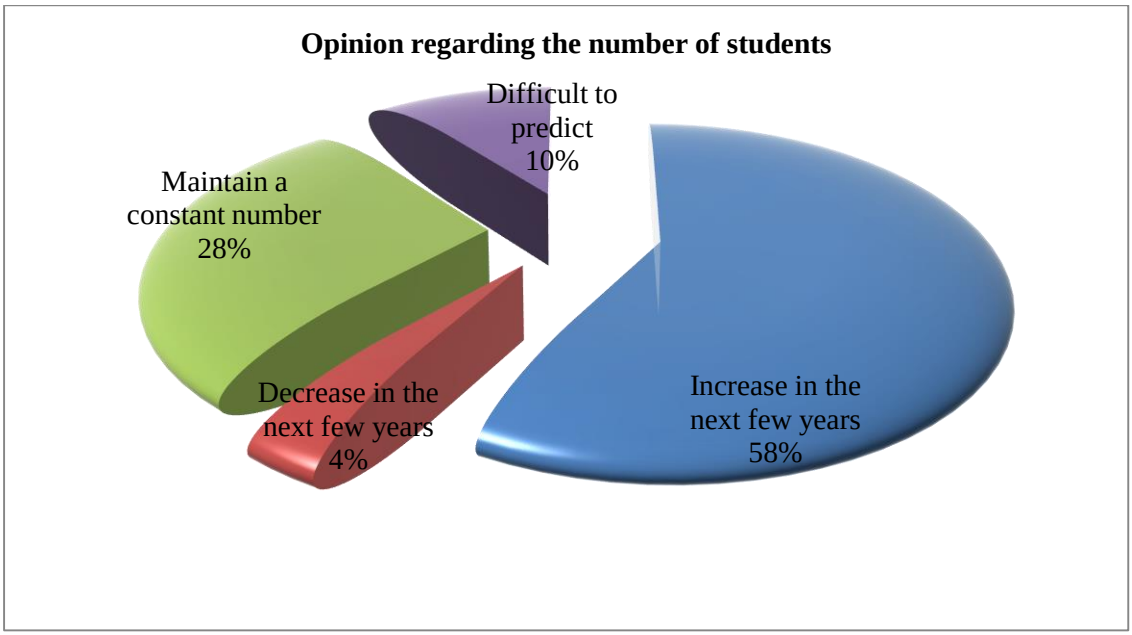
Most of the lecturers at 62.5 % (23.4% + 39.1%) perceived that internet connectivity is not reliable and efficient in their Universities.

Table 9: Lecturers' opinion regarding the current situation on teaching resources

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	The situation will improve	12	18.8	18.8	18.8
	There is a possibility of status quo for a while	19	29.7	29.7	48.4
	The situation is likely to get worse	24	37.5	37.5	85.9
	It is not possible to predict	9	14.1	14.1	100.0
	Total	**64**	**100.0**	**100.0**	

37.5% of the lecturers perceived that the current inadequacy of teaching resources would get worse.

Figure 25: Opinion regarding the number of students



Majority of the lecturers (58%) predicted that the number of students would increase in the future.

Figure 26: Opinion regarding the library in the near future

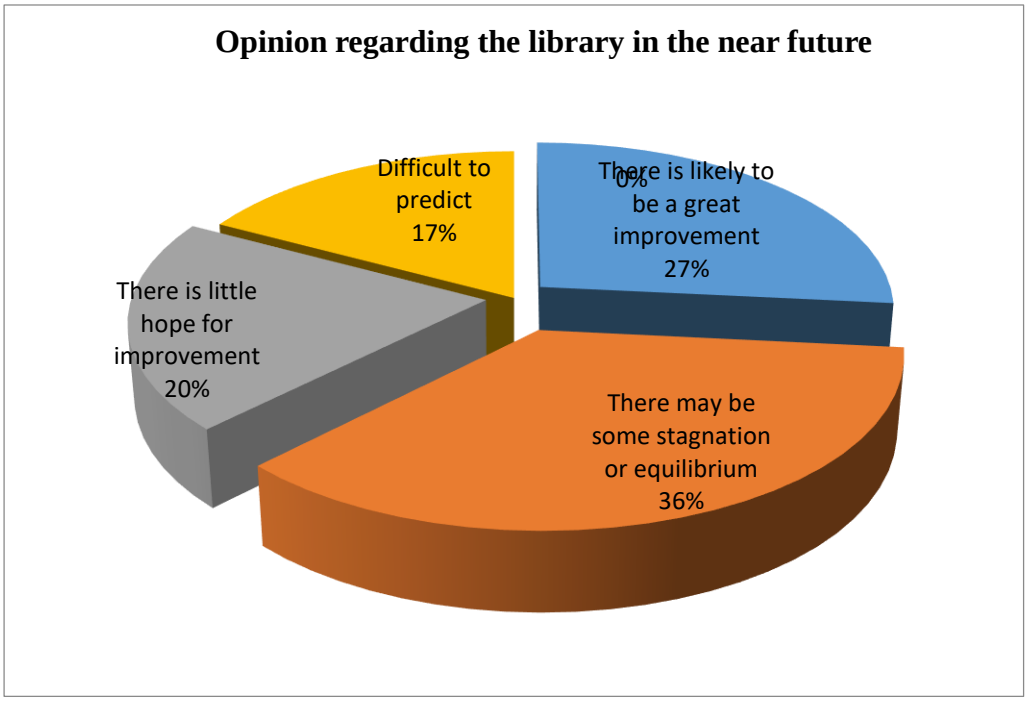


Figure 27: Opinion regarding teaching resources and lecture rooms

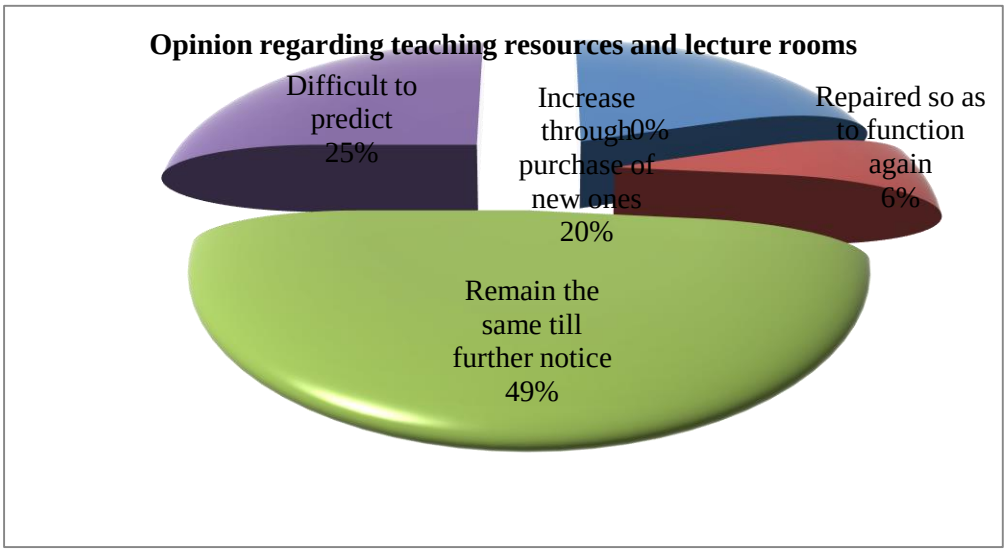


Figure 28: Opinion regarding the number of lecturers

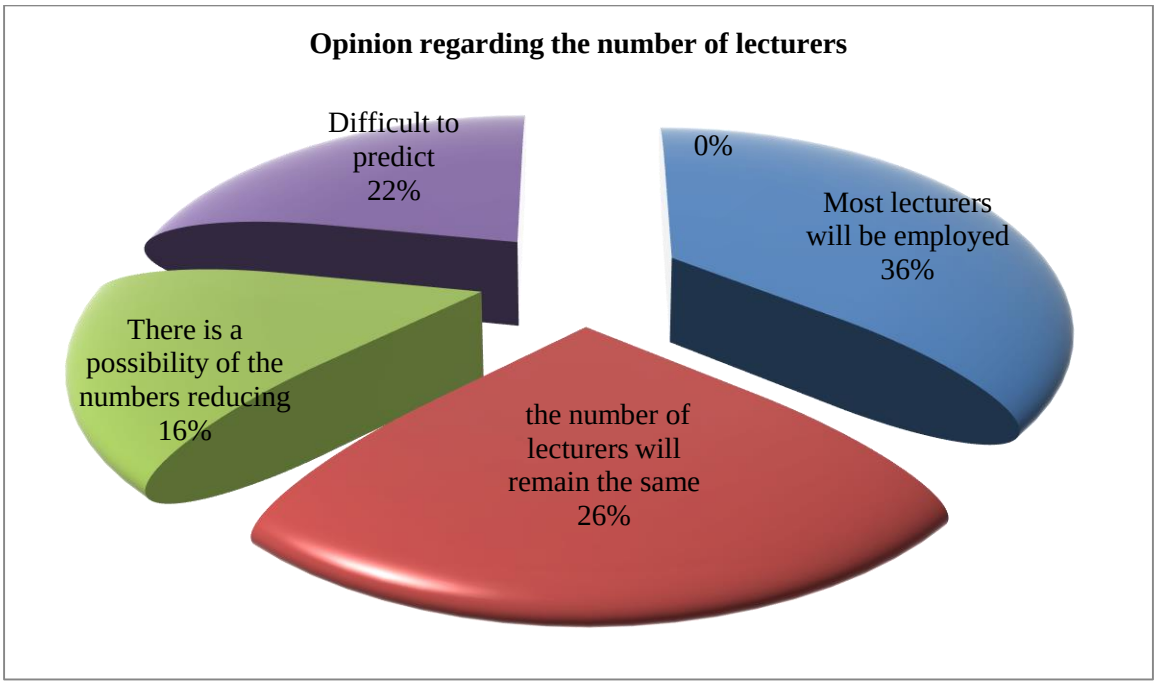


Table 10: The number of computers for students in the computer labs are most likely going to:

	Frequency	Percent	Valid Percent	Cumulative Percent
Increase in number	14	21.9	21.9	21.9
Remain the same for a while	29	45.3	45.3	67.2
Be repaired	1	1.6	1.6	68.8
It is difficult to predict	20	31.3	31.3	100.0
Total	**64**	**100.0**	**100.0**	

45% of the lecturers perceive that the number of students' computers are most likely going to remain the same.

Table 11: Internet connectivity in the school is most likely going to:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Improve in coverage	27	42.2	42.2	42.2
	Remain the same	18	28.1	28.1	70.3
	Decline in capacity	5	7.8	7.8	78.1
	It is difficult to predict	14	21.9	21.9	100.0
	Total	**64**	**100.0**	**100.0**	

Majority of the lecturers 42.2 % perceive that internet connectivity in their schools is likely to improve in coverage.

4.3 FINDINGS FROM QUALITATIVE DATA (FOCUS GROUP DISCUSSIONS)

4.3.0 Objective 2:

To assess the perceptions of adequacy of learning resources in the MBChB and BScN programmes by students in the two public Universities.

4.3.1 Adequacy of Space in Lecture Rooms

VOICE 007 – SON, A

"There is adequate space but it all depends on the number of students. But it is mostly okay."

VOICE 008 – SOM, A

“We are few so there is adequate space”.

VOICE 009– SON, B

“Yes, we have adequate space and there is enough ventilation. When you need to get out you just get out.”

VOICE 010 – SOM, B

“Yes, I would say we have adequate space in our lecture rooms for learning.”

4.3.2 Adequacy of Space in the Skills Lab

VOICE 007 – SON, A

“No, we don’t have adequate space in our skills lab. A class needs to be divided into two or three groups in order to see what is happening there.”

VOICE 008 – SOM, A

“Ya, we have three skills Labs and the space is enough”

VOICE 009 – SON, B

“We only have one skills Lab which we share with medical school and sometimes we can be quite congested there. We are usually ten per group for a demonstration of about ten groups.”

VOICE 010 – SOM, B

“I would respond yes. We have an adequate and well equipped skills lab. We actually don’t have much access to the skills lab because it is located in the School of Nursing. There is none in the Medical School.” Actually most of our skills are learnt in the hospital. We are normally divided into smaller groups in a class.” However, in the hospital we are congested. Sometimes we are 20 students in a room and we may not even hear what the consultant is saying during the ward round.”

4.3.3 Adequacy of Learning Resources in the Lecture Room

VOICE 007 – SON A

"From my own assessment they are enough. The lecturer will always find the projector already set. White boards and white board markers are available. We also have flip charts."

VOICE 008 – SOM A

"LCDs are enough but we need permanent projectors in each class. White board markers are not in every class room."

VOICE 009 –SON B

"We have whiteboard markers and wide white notice boards; also projectors. We also have flannel charts for use in the hospital but not in lecture theatres. We don't know whether they are for the University or hospital. We don't have screens in class and sometimes we see slides connected to video monitors"

VOICE 010 – SOM B

"In our lecture theatres we have screens and also a microphone, laptop and projectors. Screens have colours marks that interfere with visibility e.g. blue colour. Sometimes microphones tend to have low batteries and can be off from use for half a week."

4.3.4 Adequacy of Equipment and Instruments in the Skills Laboratory

VOICE 007 – SON –A

"We have enough equipment considering that lecturers divide students into groups during demonstrations."

VOICE 008 – SOM – A

"Ya, we have three skills Labs and the space is enough. There is only one bed and one dummy so we are divided into smaller groups so that in a group we are 3-4 students per group in a group of 14-17 students."

VOICE 009 – SON – B

"We have enough space but we share one manikin for ten students."

VOICE 010 – SOM – B

"In this institution we do not have our own skills lab for the school of Medicine. We share the one for the School of Nursing and we don't have enough skills Lab equipment probably because of the large number of students. We have to be divided into groups. In our class we are 360 students."

4.3.5 The Audio-Visual Aids that Teachers Use in the Classroom During Teaching

VOICE 007 – SON – A

"We have projectors for power point presentations. We also have white boards where lecturers draw some diagrams. Some lecturers also come with video clips for example for teaching anatomy."

VOICE 008 – SOM – A

"The lecturers usually use LCD projectors and there are two lecturers who use Overhead projectors. I think it's a matter of preference."

VOICE 009 –SON – B

"We have white boards and white board markers, wide notice boards that are used as screens, projectors. We also have flannel charts for use in the hospital but not in lecture theatres. We don't know whether they are for the University or hospital. We don't have screens in class and sometimes we see slides connected to video monitors".

VOICE 010 – SOM – B

"In our lecture theatres we have screens, laptops, projectors and also microphones. Some of our screens have colours that interfere with visualizing the presentations. Microphones tend to have low batteries and can be off from use for about half a week. During that time the students who sit at the back cannot hear properly what the lecturer is saying."

4.3.6 Time Management by Lecturers

VOICE 007 – SON –A

"Yes they teach during class hours as per the timetable, then they tell us to read more during our free time. But some don't complete their work because of seminars and conferences."

VOICE 008 – SOM – A

"Some lecturers are very punctual and stay a little longer, but some miss classes and then make up later for their classes. Others come late or leave early and a few can be difficult to find. There are some of them who go out of the country for even two months when we are in session. Surgeons can be late when they extend surgery."

VOICE 009 – SON B

"Lecturers are not always on time. We find ourselves having make-up classes which inconvenience us like during lunch time, instead of having our one hour break, we will be in class and this is very inconveniencing. Some lecturers are punctual but not so frequently."

VOICE 010 – SOM – B

"Sometimes a lecturer is meant to come at 9 am but may come at 10 am. However they organize for make-up classes but this inconveniences the students. Sometimes a lecturer

may promise to come in an hour's time but may end up not turning up at all. There are a few departments that are known to have punctual lecturers."

4.3.7 Type of Equipment Found in the Skills Lab

VOICE 007 – SON –A

"In skills lab we have manikins, dummies, beds, trolleys and basins among other things. We can insert a naso-gastric tube without any problem."

VOICE 008 – SOM – A

"We have equipment for newborn resuscitation, chest-tube insertion and intubation among others. We have only one bed with one dummy but we are able to learn many skills."

VOICE 009 – SON – B

"For Family Planning we have a doll. We also have a manikin for midwifery that can actually deliver a baby but it is controlled by somebody. I think we have enough equipment."

VOICE 010 – SOM – B

"In the skills lab we have around six BP machines and that means one or two BP machines for a group of 30 students. In order to learn in the skills laboratory we are divided into ten groups in order to have a skills lab experience. We normally utilize our own time to go the skills lab and practice skills when other students are not there.

4.3.8 Availability of Smart Boards in the Lecture Rooms

VOICE 007 – SON –A

"No, we don't have one. It would be a great pleasure to have one."

VOICE 008 – SOM - A

“We have never seen one.”

VOICE 009 – SON – B

“We don’t have one. We would like to have one so that we can gauge with other countries.”

VOICE 010 – SOM – B

“No we don’t have a SMART board. We would like to have SMART boards and see how they work.”

4.3.9 Availability of A Computer Lab and Their Adequacy

VOICE 007 – SON – A

“The computer Lab is only enough in terms of space but you have to go there with your laptop. There are times when the place is so busy when students are doing their research and assignments that those without laptops can be inconvenienced at that time.”

VOICE 008 – SOM – A

“We do have a computer lab with 15 working computers. We have to carry our laptops sometimes.”

VOICE 009 – SON – B

“We have a computer lab in the library but not in our own school. They are not even 50 and the whole college is using it. Most students use their laptops there. Fortunately, we have Wi-Fi everywhere in the University.”

VOICE 010- SOM – B

"Yes we have it in the library. Computers are not enough. They are roughly 15. That are in good working order so mostly they are occupied, or you have to wake up very early in the morning when the library is being opened so as to get a computer."

4.3.10 Other Learning Resources that Students Would Like to Have for Learning Purposes

VOICE 007 – SON – A

"We would like to have the computer lab expanded and number of computers increased." We would also want to have charts with diagrams in our lecture rooms. They should not just be in clinics and hospital. We can at lease visualize the presentations from the diagrams.

We would also like to have a public address system in the halls because backbenchers usually don't hear properly when the class is large."

VOICE 008 – SOM – A

"We need sockets in the lecture rooms to plug in our laptops. We also need curtains in the classrooms to reduce light in the lecture rooms when LCDs are in use. There was a time we were promised tablets but we have never seen them. We would still want to have them. We see them with staff and their children. We really don't know what happened."

VOICE 009 – SON – B

Our rooms are too illuminated and they need to be darkened. They can put up curtains to darken the classrooms.

VOICE 010 – SOM – B

Many of the sockets in the library are not functional. We would like to use them for our laptops.

4.3.11 Students Perceptions about their Current Situation

VOICE 007 – SON –A

In the diagnostic lab we should not be more than one class. Sometimes we are combined with medical students and we can't see what the teacher is doing. We don't even have enough space to move around because we are too many in the room."

VOICE 008 – SOM – A

"The computer lab is just for internet. Most students have their own laptops."

VOICE 009- SON – B

"Some computers are working but most of them are not. They are poorly maintained because I think the funds intended for maintaining these computers do not go to the real purpose. We think some people pocket the money. We have even reported the issue of curtains in the lecture rooms and nothing was done about it. We are told it takes a long procedure from top to bottom and it will take a lot of time."

VOICE 010 – SOM – B

In my opinion, all the challenges are due to apathy and this is destroying our institution. The main objective of the student is to graduate whether there are enough learning resources or not. I think it also depends on the administrators of the institution at the time.

The staff don't request of our opinion regarding learning resources. They don't do a monthly or yearly assessment which they should.

4.3.12 Students' Suggestions Regarding their Current Situation

VOICE 007 – SON - A

"There should be an increase in the number of dummies in the skills lab. We should not have two classes combined in the diagnostic lab. Expand or build a new computer lab and increase the number of computers."

VOICE 008 –SOM – A

"We need curtains in the lecture rooms to reduce light when LCD projectors are in use."

VOICE 009 – SON - B

"I think there is a way out. The school can budget and buy curtains for lecture rooms. Every school has a budget from the University. There is usually a day for computer maintenance, so they can repair the computers that are broken down."

VOICE 010 – SOM – B

"The University should regulate the number of students during intake so that they take a number that they can contain."

4.3.13 State of the Library

VOICE 007 – SON – A

"We need the learning resource center to have text books updated because we have very old books**.** The computer lab should be expanded or build a new computer lab and increase the number of computers."

VOICE 008 – SOM – A

"Most of the textbooks in the learning resource centre are old version and so we need newer books. We also need more sockets in the library. One space for reading is also too small for the student, the laptop and note book. We need more space."

VOICE 009 – SON – B

"Our library is very well equipped. We are even allowed to request for new books if we want. We also have online catalogue but I think they should update it because it sometimes shows that a book is in the library but it has actually been borrowed by someone."

VOICE 010 – SOM – B

"The library is well equipped and we have internet there. We have Wi-Fi. We are also taught how to use online resources by the library staff. Our books are updated so that they are current. We are also allowed to request for the most current books and they are purchased by the University. The only problem is that some sockets there are not working and we need them for our laptops."

4.4 THEMES DEVELOPED FROM QUALITATIVE DATA

Theme 1: Adequacy of space and learning resources in the lecture rooms

Theme 2: Adequacy of space and learning resources in the Skills Lab

Theme 3: Adequacy of computers in the computer labs

Theme 4: Adequacy of library stocking for current text books, journals and Periodicals

Theme 5: Time Management by lecturers

4.5 FINDINGS FROM QUANTITAVE DATA PART 1B

4.5.0 Objective 3:

To identify the challenges encountered by lecturers in acquiring and utilizing teaching resources

Figure 29: The administrators make initiative to replace retired or resigned lecturers

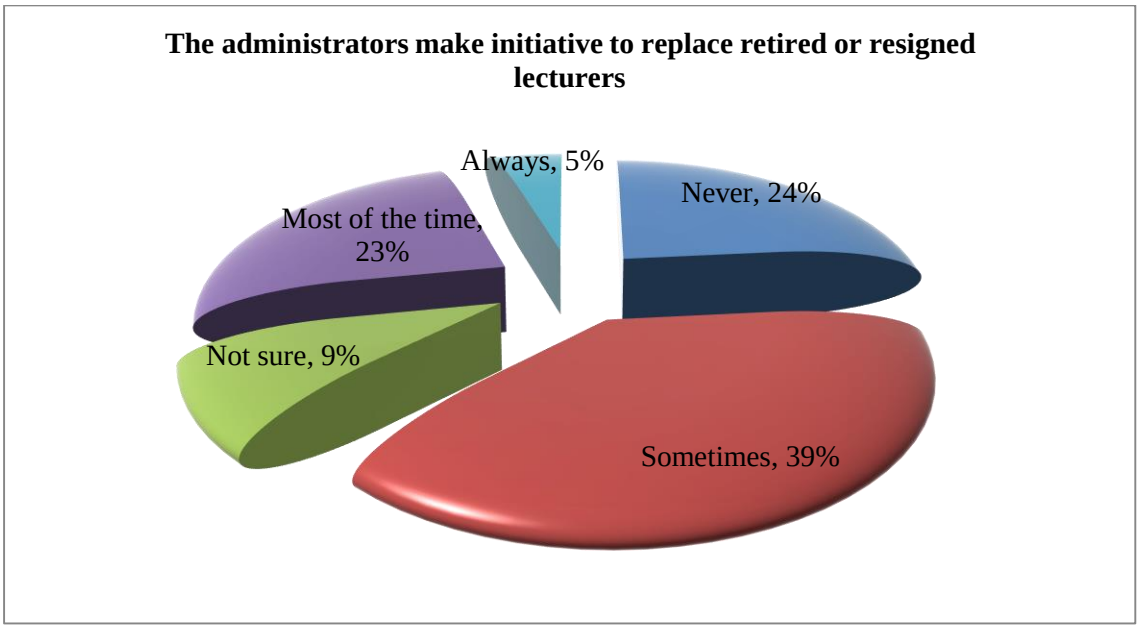


Table 12: Procurement process of teaching materials is long and tedious

			Procurement process of teaching materials is long and tedious					Total
			Strongly disagree	Disagree	Not sure	Agree	Strongly agree	
School of Nursing	UON	Count	1	4	3	3	2	**13**
		% of Total	4.5%	18.2%	13.6%	13.6%	9.1%	**59.1%**
	MOI	Count	1	1	2	3	2	**9**
		% of Total	4.5%	4.5%	9.1%	13.6%	9.1%	**40.9%**
Total		**Count**	**2**	**5**	**5**	**6**	**4**	**22**
		% of Total	**9.1%**	**22.7%**	**22.7%**	**27.3%**	**18.2%**	**100.0%**

Procurement process is not very long and tedious in UON as compared to MOI University

Table 13: Administrators are very keen to ensure that the Learning Resource Centre (Library) is well equipped with the most current text books and periodicals

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	10	15.6	15.6	15.6
	Sometimes	19	29.7	29.7	45.3
	Not sure	17	26.6	26.6	71.9
	Most of the time	14	21.9	21.9	93.8
	Always	4	6.3	6.3	100.0
	Total	**64**	**100.0**	**100.0**	

Figure 30: Signatures from administrators are easy to obtain during the procurement process of materials

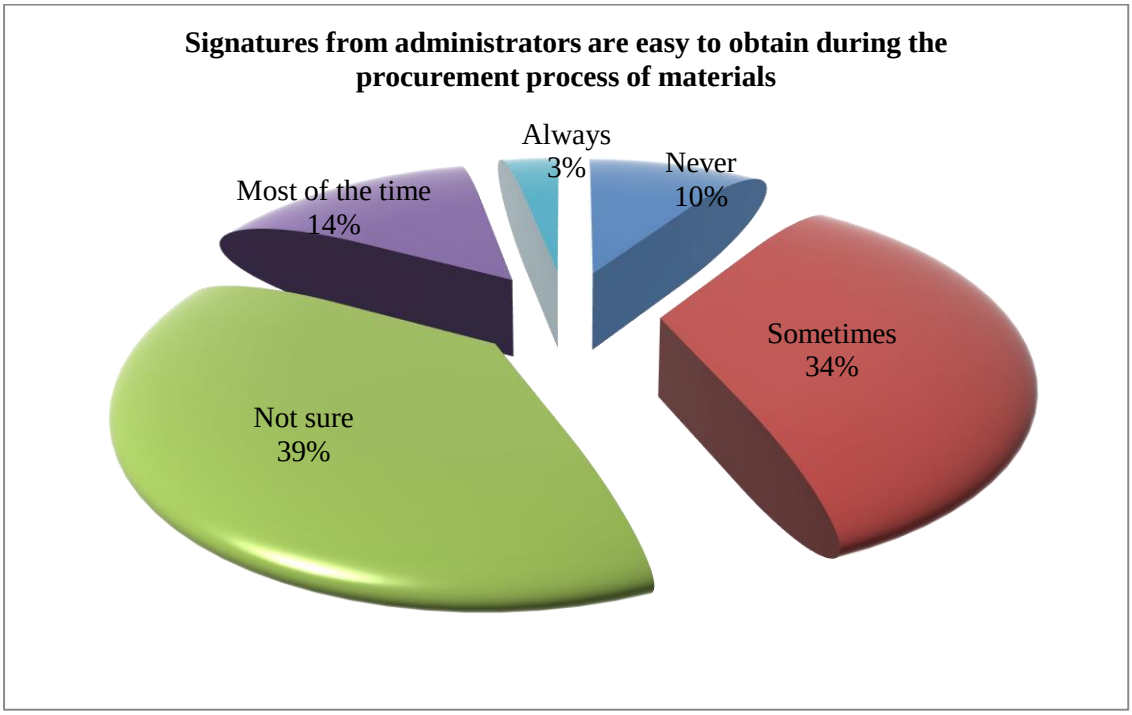


Table 14: When equipment breaks down, the administrators offer full support in its maintenance or replacement

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	13	20.3	20.3	20.3
	Sometimes	24	37.5	37.5	57.8
	Not sure	17	26.6	26.6	84.4
	Most of the time	9	14.1	14.1	98.4
	Always	1	1.6	1.6	100.0
	Total	**64**	**100.0**	**100.0**	

Figure 3: Crowding of students in lecture rooms is a big concern to the administrators

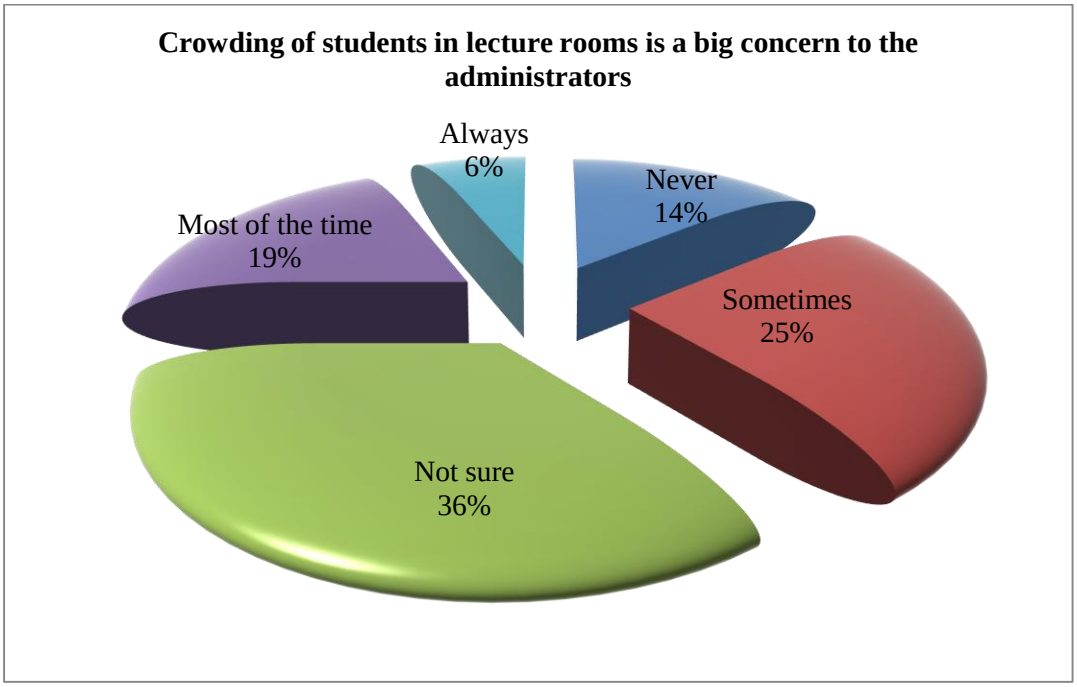


Table 15: The administrators often communicate with lecturers regarding plans to construct new lecture rooms as the number of students increase

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	27	42.2	42.2	42.2
	Sometimes	15	23.4	23.4	65.6
	Not sure	16	25.0	25.0	90.6
	Most of the time	3	4.7	4.7	95.3
	Always	3	4.7	4.7	100.0
	Total	**64**	**100.0**	**100.0**	

4.3.1. Objective 4A: To compare the perception of the adequacy of teaching resources by lecturers between the two Schools in the two Universities.

4.5.1 Schools of Nursing

Table 16: Adequacy of classroom space in the Schools of Nursing

			Adequacy of classroom space		**Total**
			Yes	No	
School of Nursing	UON	Count	5	8	**13**
		% of Total	22.7%	36.4%	**59.1%**
	MOI	Count	3	6	**9**
		% of Total	13.6%	27.3%	**40.9%**
Total		**Count**	**8**	**14**	**22**
		% of Total	**36.4%**	**63.6%**	**100.0%**

Most of the respondents totaling to 63.6% from the two universities in the schools of nursing agree that there is no adequate classroom space.

Table 17: **University receives equipment and other materials from NGOs**

			University receives equipment and other materials from NGOs		
			Yes	No	
School of Nursing	UON	Count	6	7	**13**
		% of Total	27.3%	31.8%	**59.1%**
	MOI	Count	4	5	**9**
		% of Total	18.2%	22.7%	**40.9%**
Total		**Count**	**10**	**12**	**22**
		% of Total	**45.5%**	**54.5%**	**100.0%**

In the school of nursing, 54% of Nursing lecturers from both universities had the opinion that the Universities were not receiving equipment and other materials from NGO's.

Table 18: Libraries are well equipped with current learning materials

			Library is equipped with current learning materials		**Total**
			Yes	No	
School of Nursing	UON	Count	10	3	**13**
		% of Total	45.5%	13.6%	**59.1%**
	MOI	Count	3	6	**9**
		% of Total	13.6%	27.3%	**40.9%**
Total		**Count**	**13**	**9**	**22**
		% of Total	**59.1%**	**40.9%**	**100.0%**

The above table shows that UON library is equipped with current learning materials as per the respondents (45.5%) compared to MOI University where more than half of the respondents (13.6%) do not agree that the library is equipped with current learning materials.

Table 19: Procurement process of teaching materials is long and tedious in the two Universities

		Procurement process of teaching materials is long and tedious					**Total**
		Strongly disagree	Disagree	Not sure	Agree	Strongly agree	
UON	Count	1	4	3	3	2	**13**

		% of Total	4.5%	18.2%	13.6%	13.6%	9.1%	**59.1%**
School of Nursing	MOI	Count	1	1	2	3	2	**9**
		% of Total	4.5%	4.5%	9.1%	13.6%	9.1%	**40.9%**
Total		**Count**	**2**	**5**	**5**	**6**	**4**	**22**
		% of Total	**9.1%**	**22.7%**	**22.7%**	**27.3%**	**18.2%**	**100.0 %**

According to the respondents, half of them in both Universities perceive that the procurement process is very long and tedious the other half thinks otherwise and others are not sure.

Table 20: Sharing of teaching materials in the two Universities

			Sharing of teaching materials in the university				**Total**
			Disagree	Not sure	Agree	Strongly agree	
School of Nursing	UON	Count	4	1	5	3	**13**
		% of Total	18.2%	4.5%	22.7%	13.6%	**59.1%**
	MOI	Count	0	0	7	2	**9**
		% of Total	0.0%	0.0%	31.8%	9.1%	**40.9%**
Total		**Count**	**4**	**1**	**12**	**5**	**22**
		% of Total	**18.2%**	**4.5%**	**54.5%**	**22.7%**	**100.0%**

The two schools from the two Universities agree that there is sharing of teaching materials in their universities.

Table 21: Reliability of internet connectivity for both lecturers and students

			Reliability of internet connectivity for both lecturers and students		**Total**
			Yes	No	
School of Nursing	UON	Count	7	6	**13**
		% of Total	31.8%	27.3%	**59.1%**
	MOI	Count	2	7	**9**
		% of Total	9.1%	31.8%	**40.9%**
Total		**Count**	**9**	**13**	**22**
		% of Total	**40.9%**	**59.1%**	**100.0%**

Most of the respondents from UON say that the internet connectivity is reliable compared to respondents from MOU University who responded otherwise.

Table 22: Opinion regarding teaching resources and lecture rooms in both Universities

			Opinion regarding teaching resources and lecture rooms				**Total**
			Will improve	Possibility of status quo	Likely to get worse	Not possible to predict	
School of Nursing	UON	Count	4	5	3	1	**13**
		% of Total	18.2%	22.7%	13.6%	4.5%	**59.1%**
	MOI	Count	2	3	3	1	**9**

	% of Total	9.1%	13.6%	13.6%	4.5%	**40.9%**
Total	**Count**	**6**	**8**	**6**	**2**	**22**
	% of Total	**27.3%**	**36.4%**	**27.3%**	**9.1%**	**100.0 %**

Nursing lecturers from UON perceive that there is a possibility of status quo on availability of teaching resources and lecture rooms while in MU half of the respondents perceive that the situation is likely to get worse.

Table 23: Every lecturer can access an LCD projector whenever they have a class to teach

			Every lecturer can access an LCD projector whenever they have a class to teach		
			Yes	No	Total
School of Nursing	UON	Count	2	11	13
		% of Total	9.1%	50.0%	59.1%
	MOI	Count	5	4	9
		% of Total	22.7%	18.2%	40.9%
Total		**Count**	**7**	**15**	**22**
		% of Total	**31.8%**	**68.2%**	**100.0%**

Not every lecturer from the school of Nursing in UON can access to LCD projectors whenever they have a class while most of the respondents from MOI University responded that their lecturers can get to access the LCD projector.

Table 24: Proportion of workload to the number of lecturers good enough?

			Proportion workload to the number of lecturers good enough?		**Total**
			Yes	No	
School of Nursing	UON	Count	1	12	**13**
		% of Total	4.5%	54.5%	**59.1%**
	MOI	Count	1	8	**9**
		% of Total	4.5%	36.4%	**40.9%**
Total		**Count**	**2**	**20**	**22**
		% of Total	**9.1%**	**90.9%**	**100.0%**

The proportion of workload to the number of lecturers is not good enough from both Universities in the Schools of nursing. Almost all the respondents (90.9%) disagreed with the statement.

4.3.1.3.School of Medicine

Table 25: Adequacy of classroom space in both Medical Schools

			Adequacy of classroom space		**Total**
			Yes	No	
School of Medicine	UON	Count	5	19	**24**
		% of Total	11.9%	45.2%	**57.1%**
	MOI	Count	2	16	**18**
		% of Total	4.8%	38.1%	**42.9%**
Total		**Count**	**7**	**35**	**42**
		% of Total	**16.7%**	**83.3%**	**100.0%**

Out of 42 respondents from both UON and MOI University, most of the respondents, 83.3% say the classroom space is not adequate compared to the number of students they have.

Table 26: Crowding of students in lecture rooms

			Crowding of students in lecture rooms					**Total**
			Never	Sometimes	Not Sure	Most of the times	Always	
School of Medicine	UON	Count	2	3	11	6	2	**24**
		% of Total	4.8%	7.1%	26.2%	14.3%	4.8%	**57.1%**
	MOI	Count	5	4	8	0	1	**18**
		% of Total	11.9%	9.5%	19.0%	0.0%	2.4%	**42.9%**
Total		**Count**	**7**	**7**	**19**	**6**	**3**	**42**
		% of Total	**16.7%**	**16.7%**	**45.2%**	**14.3%**	**7.1%**	**100.0%**

Most respondents of from UON School of Medicine 26.2% perceive that there is crowding of students in the lecture rooms unlike Moi University.

Table 27: Is your skills labs well equipped for all the demonstrations?

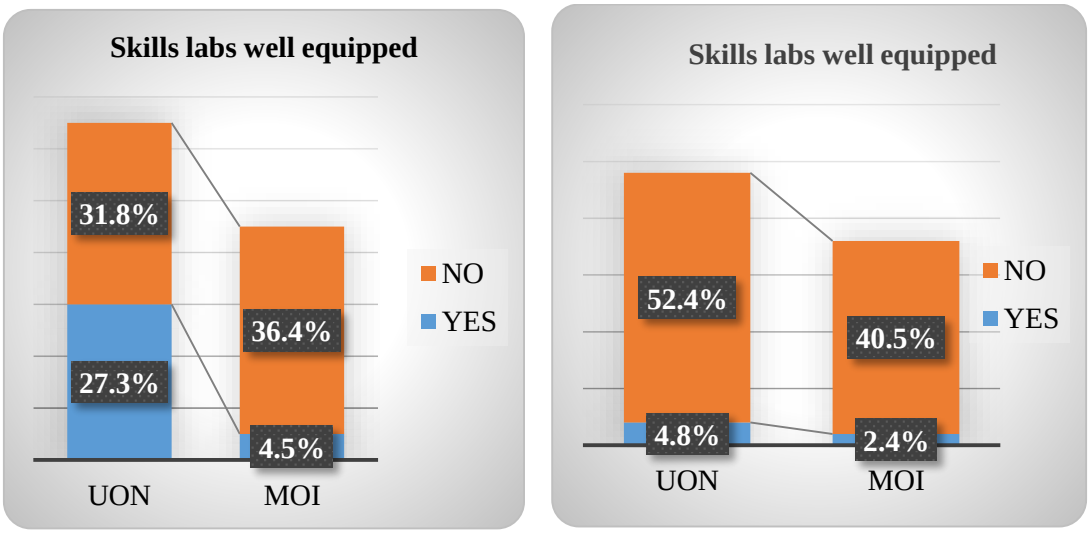
			Is your skills labs well equipped for all the demonstrations?		**Total**
			Yes	No	
School of Medicine	UON	Count	2	22	**24**

	MOI	% of Total	4.8%	52.4%	**57.1%**
		Count	1	17	**18**
		% of Total	2.4%	40.5%	**42.9%**
Total		**Count**	**3**	**39**	**42**
		% of Total	**7.1%**	**92.9%**	**100.0%**

From both Universities, it is evident from the respondents that the skills labs are not well equipped for all the demonstrations as UON and MOI University have 52.4% and 40.5% respectively. Most of them responded no.

Figure 32: Is your skills labs well equipped for all the demonstrations

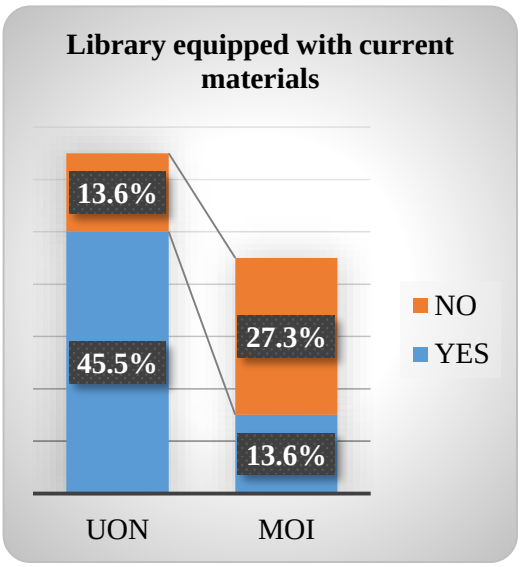
School of Nursing **School of Medicine**

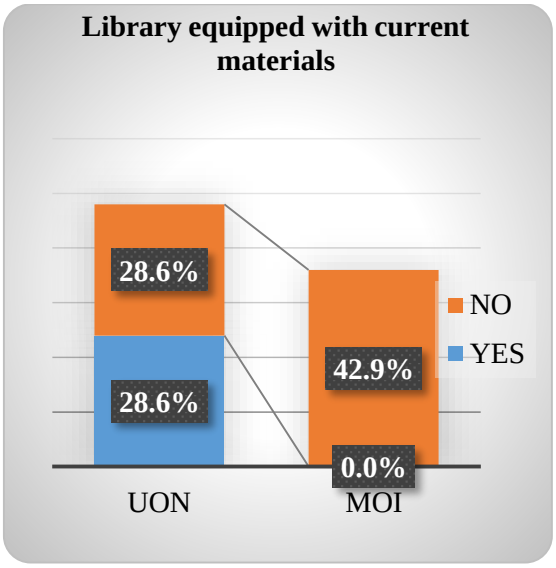


From the above two comparison graphs it is evident that skills labs are not well equipped especially in the Schools of Medicine.

Figure 33: Library is equipped with current learning materials

School of Nursing **School of Medicine**





The above two graphs show that UON has a better equipped library than MU according to the respondents in the Schools of Nursing but in the School of Medicine in UON there was divided opinion (28.6% of yes and no).

Table 28: Procurement process of teaching materials is long and tedious

			Procurement process of teaching materials is long and tedious					**Total**
			Strongly agree	Disagree	Not sure	Agree	Strongly agree	
School of Medicine	UON	Count	0	2	4	11	7	**24**
		% of Total	0.0%	4.8%	9.5%	26.2%	16.7%	**57.1%**
	MOI	Count	2	2	4	4	6	**18**
		% of Total	4.8%	4.8%	9.5%	9.5%	14.3%	**42.9%**
Total		**Count**	**2**	**4**	**8**	**15**	**13**	**42**

	% of Total	**4.8%**	**9.5%**	**19.0%**	**35.7%**	**31.0%**	**100.0%**

Table 29: Administrator

Most of the respondents from UON agree that procurement process is long and tedious compared to MOI university respondents who strongly agree.

			Administrators' concern on equipping the library with current learning materials				Total
			Never	Sometimes	Not Sure	Most of the times	
School of Medicine	UON	Count	2	7	7	8	**24**
		% of Total	4.8%	16.7%	16.7%	19.0%	**57.1%**
	MOI	Count	5	6	6	1	**18**
		% of Total	11.9%	14.3%	14.3%	2.4%	**42.9%**
Total		**Count**	**7**	**13**	**13**	**9**	**42**
		% of Total	**16.7%**	**31.0%**	**31.0%**	**21.4%**	**100.0%**

Table 30: Sharing of teaching materials in the Schools of Medicine

			Sharing of teaching materials in the university					Total
			Strongly disagree	Disagree	Not sure	Agree	Strongly agree	
	UON	Count	1	2	3	13	5	**24**

		% of Total	2.4%	4.8%	7.1%	31.0%	11.9%	**57.1%**
School of Medicine	MOI	Count	2	3	4	7	2	**18**
		% of Total	4.8%	7.1%	9.5%	16.7%	4.8%	**42.9%**
Total		**Count**	**3**	**5**	**7**	**20**	**7**	**42**
		% of Total	**7.1%**	**11.9%**	**16.7%**	**47.6%**	**16.7%**	**100.0%**

From the two Universities, most of the respondents agree that a lot of teaching materials are shared in the university.

Table 31: Reliability of internet connectivity for both lecturers and students

			Reliability of internet connectivity for both lecturers and students		**Total**
			Yes	No	
	UON	Count	12	12	24

School of Medicine	MOI	% of Total	28.6%	28.6%	57.1%
		Count	5	13	18
		% of Total	11.9%	31.0%	42.9%
Total		**Count**	**17**	**25**	**42**
		% of Total	**40.5%**	**59.5%**	**100.0%**

Respondents from UON are divided on the opinion that the internet connectivity is reliable for both students and lecturers while most MOI University respondents do not agree with the statement.

Table 32: Opinion regarding teaching resources and lecture rooms in the Schools of Medicine

			Opinion regarding teaching resources and lecture rooms				**Total**
			Will improve	Possibility of status quo	Likely to get worse	Not possible to predict	
School of Medicine	UON	Count	5	6	8	5	**24**
		% of Total	11.9%	14.3%	19.0%	11.9%	**57.1%**
	MOI	Count	1	5	10	2	**18**
		% of Total	2.4%	11.9%	23.8%	4.8%	**42.9%**
Total		**Count**	**6**	**11**	**18**	**7**	**42**
		% of Total	**14.3%**	**26.2%**	**42.9%**	**16.7%**	**100.0 %**

Lecturers perceive that teaching resources and lecture rooms from the two Universities are likely to get worse as time goes by with the situation.

Table 33: Every lecturer can access an LCD projector whenever they have a class to teach

			Every lecturer can access an LCD projector whenever they have a class to teach		**Total**
			Yes	No	
School of Medicine	UON	Count	13	11	24
		% of Total	31.0%	26.2%	57.1%
	MOI	Count	7	11	18
		% of Total	16.7%	26.2%	42.9%
Total		**Count**	**20**	**22**	**42**
		% of Total	**47.6%**	**52.4%**	**100.0%**

Most of the lecturers from UON School of Medicine can access LCD projectors whenever they have a class to teach compared to MOI University.

Table 34: Proportion of workload to the number of lecturers good enough

			Proportion workload to the number of lecturers good enough?		**Total**
			Yes	No	
School of Medicine	UON	Count	3	21	24
		% of Total	7.1%	50.0%	57.1%
	MOI	Count	1	17	18
		% of Total	2.4%	40.5%	42.9%

Total	**Count**	**4**	**38**	**42**
	% of Total	**9.5%**	**90.5%**	**100.0%**

When the workload and the number of lecturers are compared, the proportion is not good enough from both universities in the school of medicine by 90.5%.

4.3.2. Objective 4b: to compare the perceptions of availability of learning resources by students in the two universities (from FGDs)

4.3.2.3. Theme 1: Adequacy of space and learning resources in the lecture rooms

Students from University A in both School of Nursing and school of Medicine said that they had no problem of space in their lecture rooms. The same case was with the students in University B in both School of Nursing and School of Medicine because there were large halls and microphones for large numbers of students. However, it was noted with concern from student' discussions that in the Medical school there were classes of over 300 students taught in one lecture hall. University B medical students stated that they had challenges during ward rounds because they were usually too many students in a ward cubical excluding the doctors.

Regarding adequacy of teaching resources, students from University A – SON stated that they had LCD Projectors but they needed diagram charts in their lecture rooms and microphones for large halls.

University A – SOM students stated that they had LCD projectors and white boards but white board markers were not always available. They felt that they needed permanently fixed projectors in the lecture rooms and also more sockets for their laptops.

In University B - SON students indicated that they needed screens for projecting learning content instead of using the wall as a screen. They also stated that they need curtains to darken the rooms when a lecturer is using the overhead projector. Students from University B – SOM said that their teaching resources were enough but some of their screens had coloured markings on them and that interfered with visibility of the teaching content on the screen. They complained that microphones occasionally had low batteries and would therefore nonfunctional. This inconvenienced the students who sit at the back of the lecture theatres.

In both Universities none of the students had ever seen a SMART Board and they all expressed their interest in having them installed in their Schools so that they could keep pace with the academic trend in the developing world.

4.3.2.4.Theme 2: Adequacy of space and learning resources in the Skills Lab

In University A- SON the students said that Skills Lab space is only enough when they were divided into groups. SOM students said that they had 3 skills labs and space was always enough when they were also divided into groups. The SOM students said that they only had one bed and one dummy for demonstrations.

In University B- SOM students stated that they don't really have a skills lab in their school but share a skills lab with the School of Nursing. They added that equipment for demonstrations was not enough due to large numbers of students e.g. there were only 6 BP machines for about 30 students.

4.3.2.5.Theme 3: Adequacy of computers in the computer labs

University A- SON students stated that computers were not enough. They felt that the computer lab should be expanded and more computers added for the students. The SOM

students said that there were only 15 computers and they were not enough for all the students. Students have to use their own laptops.

In University B – SON students were disappointed by the fact that there were less than 50 computers for the entire College of Health Sciences. Most students had to use their own laptops. The SOM students also had a similar view that computers were not enough. They stated that only about 15 computers were in good working order and therefore most students had to use their own laptops. This is an important point in that if some poor students cannot get access to the technology which is central to their learning, when eventually they fail in exams, it becomes difficult to trace the origin of their failure. More crafty students may engage in activities aimed at getting the funds needed to obtain the required technology. Some of the activities may be dangerous even to the students themselves. It is this kind of observation that many researches do not mention.

4.3.2.6.Theme 4: Adequacy of library stocking for current text books and periodicals

In University A both the SON and SOM students exclaimed that most text books were too old and therefore they needed newer versions to be purchased. The SOM students felt that the reading space in the library was too small for the person, laptop, text books and note book.

In University B both the SON and SOM students were happy with their well-equipped library. They said that their library even has Wi-Fi and the library staff also assist them to access online electronic resources. They also stated that students in the College are allowed to request for the most current books to be purchased for library use. However, they stated that they needed more sockets in the library for charging their laptops.

4.3.2.7.Theme 5: Time Management by lecturers

The University A –SON students said that some lecturers do not complete their work because of attending Seminars and Conferences. The SOM students said that some lecturers do miss classes and then make up later. Some lecturers come late and left early giving them a 'raw deal'. Some go out of the country for even 2 months while students are in session. Surgeons were reported to be very late for lectures sometimes.

In University B both the SON and SOM students said that their lecturers missed some classes but they always tried to make up for the missed classes. They complained that some make-up classes were slotted in during lunch time and therefore inconveniencing them because that was their own time. The SOM students also complained that some lecturers could be late even for a one full hour, possibly because of traffic jam. They also stated that a lecturer would promise to come for class but ended up not turning up at all. However, they said, some departments had very punctual lecturers.

CHAPTER FIVE

5.0 DISCUSSION OF THE STUDY FINDINGS AND IMPLICATIONS

5.1 Introduction

This chapter presents a discussion of the findings and their implications in the study.

4.3.1.1 Objective1: To assess the perception of adequacy of teaching resources in the MBChB and BScN programmes by lecturers in the two public Universities.

It was evident from this study that teaching resources were inadequate in both Moi University and Nairobi University. The Classroom space was a major concern in the University of Nairobi at the School of Medicine. This was attributed to high numbers of students' admissions. This is in agreement with a report by Kwach (2017) who stated that there has been an increase of Medical students by 110 times since the University began in 1967.

Other teaching resources that lecturers perceived to be inadequate included the number of lecturers themselves, Skills Laboratory equipment, computers for students in the computer labs. Lecturers also perceived that it was necessary for the Universities to own some laptops for use by lecturers in class just like the LCD projectors. Some lecturers also felt that there was need to increase the number of LCD projectors in the University to avoid too much sharing of the same.

These research findings are in line with a study done by Gudo (2011) on issues of quality education in private and public Universities. Results from the study revealed that public Universities did not have adequate physical facilities and other teaching resources for offering services to their students (Gudo et al, 2011).

These findings also agree with the research results of a study which was done in two Public Universities in Kenya on challenges that the management encountered in

teaching and learning of University students. The study revealed that Public Universities did not have enough teaching and learning resources, especially lecture halls, computers, textbooks and library space. Moreover, there was a problem of inadequate teaching staff (Mbirithi, 2013).

Inadequate resources could be attributed to scarcity of finances in the Universities. In the standard newspaper of Kenya, Oduor (2018) stated that there is a looming crisis as public Universities face closure over debts, some of which were in Billions of shillings. Another study conducted by Likoko et al in Western Kenya teachers' colleges showed that institutions were faced with challenges of teaching resources. The study identified lack of adequate facilities like libraries and instructional materials. This led to a negative impact on the quality of graduates produced (Likoko et al, 2013).

4.3.1.2 Objective 2: To assess the perception of adequacy of learning resources in the MBChB and BScN programmes by students.

There were different perceptions regarding adequacy of learning resources by students in the two Universities. In University A, students stated that the library had very old text books.

According to the Nation Newspaper dated 3rd October, 2015, libraries are overcrowded, books are outdated, journal holdings lag years behind, laboratories and equipment are outdated and inadequate, rooms in hostels are overcrowded, and academic staff are not compensated appropriately.

They also said that they needed more sockets in the library for accessing electric power for their laptops. Students are expected to do assignments and read in the library in order to meet their education requirements. If a library is not well equipped with current text books and periodicals, this creates a challenge during their private study time.

A library is a very resourceful area for students because that is where they get their learning resources for doing their assignments and also for further reading on what they have been taught in class. Without library resources, students simply reproduce what the lecturers have taught them or present poorly done assignments.

These findings are similar with those of Likoko et al in Western Kenya teachers' colleges which showed that institutions were faced with challenges of teaching resources. The study identified lack of adequate facilities like libraries and instructional materials. This led to a negative impact on the quality of graduates produced (*Likoko et al.*, 2013).

Students in both Universities also stated that they needed more computers in the computer labs which were located in the libraries. As the numbers of students' increase, so should their learning resources increase. Some students could not afford to buy their own laptops and therefore need to use the computers in the computer labs in order to do their assignments and to search for new information.

These findings are in line with a study done by Tarus (2015) on challenges of implementing e-learning in Kenyan Public Universities revealed that there was inadequate ICT and e-learning infrastructure which includes availability of network, internet connectivity, computer labs, financial constraints and lack of affordable and adequate internet bandwidth (*Tarus et al.*, 2015).

Computers are an important aspect in innovative education because students do a lot of work on their own. For this reason, students are very inconvenienced if they do not have laptops of their own and there are no alternative computers for use. Students who have no laptops can only result to doing their assignments in Cyber Cafes which are not ideal places for doing assignments because of the noise in these places and also the high cost of the service.

All students from both Universities reported lecturers' inappropriate use of time. They stated that some lecturers missed classes or came to class very late.

The punctuality of lecturers is a very important aspect in University learning because all instruction of students comes from the lecturer. Moreover, students pay tuition fees so that it is possible to be taught for the hours that they have paid for. This then means that a lecturer who is late for class or who fails to turn up for class inconveniences his or her students financially.

When course content is not completed within a trimester, students do not perform well in their exams and the future graduates may be incomplete because they lack some knowledge which was not taught by the lecturer, yet this knowledge is required in the working area during employment.

In the Focus Group Discussions students also said that they would love to have charts in their lecture rooms so that they could use them for revising what the lecturers had taught them. Visual aids like charts help to enhance understanding of subject matter especially for visual learners.

The medical students at University B students also stated that the screens used for projections had many coloured marks and the Nursing students stated that they needed curtains to reduce the amount of light in the lecture rooms during projection of the LCD projector.

According to Leopold (2012), visual learners learn best when they see something, auditory learners prefer to process information through oral/aural modes and kinesthetic learners prefer to learn through activities that require total physical involvement. This is achieved through the use of teaching aids by the instructors.

Another problem that students complained about in University B School of Medicine was that they did not have a skills lab of their own and were sharing a skills lab with

the School of Nursing students. They also said that they were congested in the hospital ward rounds. This is attributed to high students' intake without availing more clinical sites for students. It would have been better to avail more teaching hospitals in Nairobi in order to ease congestion at the Kenyatta National Hospital.

4.3.1.3 Objective 3: To identify the challenges encountered by lecturers in acquiring and utilizing teaching resources.

Lecturers believed that the process of trying to acquire new teaching equipment was long and tedious. This is mainly attributed by the many signatures that must be obtained from signatories in different offices in order to approve the purchase of materials and equipment. The fact the procurement process is long and tedious makes acquisition of materials and equipment difficult or slow.

Majority of the lecturers also stated that the replacement of lecturers took longer than three months. Lecturers are the main type of human resource that is engaged in teaching. This could be attributed to the recruitment process which requires shortlisting and interviewing of prospective workers. The staff recruitment and selection policy guides and provides the protocol to recruit academic staff. Recruitment must also be guided by the employment act of 2007 which is contained in the constitution of Kenya of 2010 and Universities' act 2012. The process also requires advertising for the posts in the local newspapers, indicating the necessary qualifications per post. The process also requires that time is given to prospective employs to apply for the jobs and then be shortlisted for interviews. This process takes time.

Human resource is very important in every working environment including academic environments. Academic institutions need administrators, teachers and support staff. The acquisition of qualified personnel is in any agency is critical for the establishment

of, maintenance and growth of the organization. Therefore, active recruitment is important, and the attraction of qualified applicants is the first step in selection of personnel (Tomey, 1992).

Not every lecturer from the school of Nursing in B has access to an LCD projector whenever they have a class while most of the respondents from MOI University responded that their lecturers can get to access the LCD projector. Lack of an LCD projector makes a lecturer use the either the chalk board or white board which are old methods that do not incorporate technology. Financial constraints and heavy debts in the Universities is another reason why it is difficult to acquire new LCD projectors to prevent sharing of the same.

According to the Nation newspaper dated 3rd October, 2015, there were a number of important challenges facing Universities in Kenya. These include the demand for access and social equity, funding and the cost to students, governance and internal management, the changing roles of academics, demographic changes among academics, inefficiency, and ethnicity.

4.3.1.4 Objective 4: To compare of the perceptions of availability of teaching/learning resources by lecturers between the schools in the two Universities.

4.3.1.4.1 Schools of Nursing

ADEQUACY OF CLASSROOM SPACE

Most of the respondents from the two Universities in the schools of Nursing agree that there is no adequate classroom space in the two Universities. According to Adedokun

et al (2017) in their study they observed that students hold a positive perception of the impact of the learning space in the learning climate, their learning and motivation.

Most of the time there is crowding of students in lecture rooms at University B as compared to University A at times. Crowding of students may be attributed to high students' intake without additional infrastructure to accommodate the additional students.

WELL EQUIPED SKILLS LAB

Most respondents from the schools of Nursing in the two Universities agree that their skills labs are not well equipped for all the demonstrations.

A very important teaching resource for health professionals is a skills lab. A skills lab is a learning resource centre that provides an environment for learning clinical skills where students can practice without jeopardizing patient care or provoking adverse effects. It reduces the difficulties experienced by students when they first encounter patients in wards and clinics and improves procedural skills (Omaswa et al, 2014).

EQUIPMENT AND OTHER MATERIALS FROM NGOS

In the School of nursing, most University A and University B respondents did not accept that they receive equipment and other materials from Non-Governmental Organizations. However, University B website stated that they had received some equipment in the skills lab of the University from NGO donations.

Donations from NGOs help in boosting the learning materials in a University especially if a University or college has financial constraints.

WELL EQUIPPED LIBRARY

University B library is equipped with current learning materials as compared to University A where the respondents agreed that the library is equipped with current learning materials. Most respondents in University B said that most of the time the administrators are concerned with equipping the library with current materials. This shows that to some extent the University B prioritized equipping of the library during its allocation of funds.

A Library is the only learning resource area where students can access textbooks, journals and electronic resources for learning. This helps them to get information for doing their assignments and also studying for exams. All the text books and periodicals in a library must be current so that students are kept up to date with the current information academically.

Students who are doing post graduate studies are expected to use references that are not more than ten years old in their thesis and this needs to be put into consideration when equipping libraries in different Universities.

Some studies on equipping libraries were done and findings were recorded as follows:

A study done by Adeoye and Popoola (2011) in Nigeria revealed that the Schools of Nursing had what they called libraries but not all were established libraries in terms of resources. Another study done by Gudo (2011) on issues of quality education in private and public Universities revealed that public Universities did not have adequate physical facilities and other teaching resources for offering services to their students (Gudo et al, 2011).

LECTURERS' ACCESS TO LCD PROJECTORS

Not every lecturer from the school of Nursing in University B has access to LCD projectors whenever they have a class while most of the respondents from A responded that their lecturers can get to access the LCD projector. The LCD projector is a visual aid that facilitates understanding of the subject matter in a classroom. It is very important for visual learners who understand the learning content better when they see something, for example learning projected learning information.

A study done in University of Minnesota revealed that students who studied in a technologically enhanced classroom with large projector screens and marker boards had higher assessment scores compared to those who were taught in a traditional classroom (Perks et al, 2016).

PROPORTION OF WORKLOAD TO THE NUMBER OF LECTURERS

The proportion of workload to the number of lecturers is not good enough from both Universities in the school of nursing. Almost all the respondents disagree with the statement. Financial constraints may be hindering the so much needed qualified University lecturers so each teacher may have a normal teaching load.

Adequate human resource is very important to prevent burnout and to improve efficiency for every lecturer. Overworked lecturers cannot deliver proper teaching to students because they frequently suffer from fatigue. The acquisition of qualified personnel in any agency is critical for the establishment of, maintenance and growth of the organization. Therefore, active recruitment is important, and the attraction of qualified applicants is the first step in selection of personnel (Tomey, 1992). Lecturers are the main type of human resource that is engaged in teaching.

4.3.1.4.2 Schools of Medicine

ADEQUACY OF CLASSROOM SPACE

Most of the respondents said that the classroom space is not adequate compared to the number of students they have.

Most respondents from University B stated that students are crowded most of the time in the lecture rooms while in University A lecturers said students were crowded all the time. These findings are in line with a study done by *Gudo et al.,* (2011) that revealed that both private and public Universities had lack of enough lecture rooms and this hindered effective teaching and learning.

This information is in agreement with the responses of University B Medical students in their interviews that they were crowded both in the lecture rooms, skills lab and in ward rounds.

When students are crowded in a lecture room, learning is not likely to be effective especially for students who sit at the back of lecture rooms. The reason for this is that students who sit at the back of large lecture halls cannot hear the lecturer properly because they are far. The students may also engage in their own activities like communicating with friend on the phone or even gossiping with their neighbors.

WELL EQUIPPED SKILLS LAB

From both Universities, it is evident from the respondents that the skills labs are not well equipped for all the demonstrations. Lack of skills lab equipment means that there are procedures that a student does on a real patient without first performing the procedure on a manikin or dummy. Practicing a procedure on a real patient for the first

time can be detrimental to a patient's life especially if the procedure is invasive in nature. This information is also in agreement with students' responses in interviews, especially University B Medical students who actually stated that they have no skills lab and have to go to the School of Nursing's Skills Lab. This means that priority needs to be given to the construction and equipping of skills labs in order to enhance understanding of skills.

EQUIPMENT & MATERIALS FROM NGOS

University A receives most of its equipment as donations from NGOs. The NGOs can also be requested to help to boost in equipping libraries, skill labs and computer labs. When proposals are written by institutions for donation of equipment there are high chances that the NGO concerned will donate the equipment required. Information obtained from the University B website indicates that University B had previously received text books for its library from Oxford University Press. UNFPA East and Southern Africa also donated high tech computers to the University of Nairobi. The same University had been a beneficiary of Seeding Labs, a consortium of American institutions. Other NGOs that provide institutional support include Book Aid International (BAI) of UK which donates books to institutions, and also Electronic Information for Libraries Network (EIFL) an NGO which is a key supporter of e-project.

LIBRARY IS EQUIPPED WITH CURRENT LEARNING MATERIALS

All University A respondents said that their library was not well equipped with current learning materials. A Library is the only learning resource area where students can access textbooks, journals and electronic resources for learning. This helps them to get information for doing their assignments and also studying for exams. All the text books and periodicals in a library must be current so that students are kept up to date with the current information academically.

Students who are doing post graduate studies are expected to use references that are not more than ten years old in their thesis and this needs to be put into consideration when equipping libraries in different Universities.

According to Mubashrah (2013), library is one of those resources that support and strengthen educational quality. Unfortunately, library resources are the most ignored area in institutions of higher learning (Mubashrah and Riaz, 2013). E-resource implementation is the best thing that ever happened to academic institution because it has facilitated and improved research in the best way possible (Noreh, 2009).

ADMINISTRATORS' ROLE IN EQUIPPING THE LIBRARY WITH CURRENT LEARNING MATERIALS

In University B most lecturers believed that the administrators were concerned about equipping the library with current learning materials while in the School of Medicine some of them thought sometimes and others were not sure. Administrators are the ones who approve the purchase of supplies in the University. Without their support and approval supplies of equipment cannot take place.

PROCUREMENT PROCESS OF TEACHING MATERIALS IS LONG AND TEDIOUS

In both Universities, the lecturers believed that the procurement process of teaching materials is long and tedious. The statistical data shows that it takes too long to get approval for purchase of equipment in different offices where signatures for purchasing equipment are obtained. The process needs to be shortened to prevent discouragement to those who are ordering for supplies. Items like microphone batteries and whiteboard markers should not take too long to purchase because their lack in the classroom inconveniences both the lecturer and students.

SHARING OF TEACHING MATERIALS IN THE UNIVERSITY

From the two Universities, most of the respondents agree that there is a lot of sharing of teaching materials in the University. It was noted that there was more sharing of teaching materials in University B as compared to University A. Instructional resources are not only expected to be available to sufficient levels to enable teaching and learning to properly take place. When teaching materials are shared in a University, lecturers are usually very inconvenienced because they need to wait for the teaching resource to be available or do without it during the lecture. This also inconveniences visual learners who need to see something in order to understand it.

Teaching resources should be adequate enough for utilization in teaching and learning (Igwe in martin's library, 2004). The reality of limited physical and economic resources in school settings demands the sharing of all available instructional resources (Tanner and Lackney, 2006)

A study done in Public Universities in Nigeria revealed that these Universities did not meet the minimum requirements by the commission in charge of higher education in that country due in inadequate resources (Osarenren and Irabor, 2012).

RELIABILITY OF INTERNET CONNECTIVITY FOR BOTH LECTURERS AND STUDENTS

In University B there was divided opinion on whether internet connectivity was reliable, while in University A majority of the lecturers stated that internet connectivity was not reliable.

The use of internet is good development in innovative teaching where learner can search for information from different websites. They can also access e-journals and e-books from the e-libraries. In innovative learning, the use of internet has become very necessary because students have to work on their own when doing their assignments.

Lecturers in distance education use the internet in blended learning in which case there is contact face to face teaching and e-learning when the student is away from the training institution (Mutema et al (1999). Students in E-learning also use internet to learn, do assignments, quizzes and exams.

A study done by Tarus (2015) on challenges of implementing e-learning in Kenyan Public Universities revealed that there was inadequate ICT and e-learning infrastructure which includes availability of network, internet connectivity, computer labs, financial constraints and lack of affordable and adequate internet bandwidth (Tarus et al, 2015).

According to Juma (2015), one of the challenges for establishing distance learning in Kenya is because lack of funds, inadequate library resources, slow internet connectivity and scarcity of computing resources (Juma, 2015).

LECTURERS' ACCESS TO LCD PROJECTORS

Most of the lecturers from University A could access LCD projectors whenever they have a class to teach as compared to University B lecturers who had challenges in accessing an LCD projector when required. This could be attributed to prioritizing of

financial resource allocation in the University. Lecturers may also not be reporting broken equipment that needs to be repaired or replaced with new ones. These findings are challenged by a study done by Rokni and Karimi (2013) who found that the use of visual materials or visual elements in teaching and learning had a positive result because visual aids help to improve the student's learning in several ways. In the students' Focus Group Discussions, Medical students in University A indicated that that they would prefer to have permanently fixed projectors in the lecture rooms other than those that must be carried to class when required.

IS THE PROPORTION OF WORKLOAD TO THE NUMBER OF LECTURERS GOOD ENOUGH?

In both Universities lecturers felt that work load was not good enough as compared to the number of lecturers

When the workload and the number of lecturers are compared, majority of the lecturers stated that the proportion is not good enough from both universities in the school of medicine and Schools of Nursing. Overworked lecturers are not effective enough in their teaching. The acquisition of qualified personnel in any agency is critical for the establishment of, maintenance and growth of the organization. Therefore, active recruitment is important, and the attraction of qualified applicants is the first step in selection of personnel (Tomey, 1992). Lecturers are the main type of human resource that is engaged in teaching.

CHI SQUARE TEST

Pearson's Chi-Square was done to test the hypothesis.

The data was analyzed and the result showed a *p* value of 0.88 compared to a significant *p* value of 0.05. The p value of 0.88, which is very high compared to *p* value of 0.05 shows there is no significance and therefore we do not reject the null hypothesis.

CHAPTER 6

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 INTRODUCTION

This chapter presents the conclusions and recommendations from the study

6.2 CONCLUSIONS

6.1.1.1 OBJECTIVE 1: To assess the perception of adequacy of teaching resources in the MBChB and BScN programmes by lecturers in the two public Universities.

Classroom space was not adequate compared to the number of students they had. This was mainly attributed to high numbers of students' intake especially in the University B.

From both Universities, it is evident from the respondents that the skills labs were not well equipped for demonstrations. This could be due to scarcity of resources and lack of initiative in seeking for donor agencies.

From the two Universities, most of the respondents agreed that there was a lot of sharing of teaching materials in the University. It was noted that there was more sharing of teaching materials in University B as compared to University A.

Not every lecturer from the school of Nursing in University B had access to an LCD projector whenever they had a class. This means that new equipment is not bought as frequently as it should be and also broken equipment is not replaced on time. This could be attributed to scarcity of financial resources in public Universities.

The proportion of workload to the number of lecturers was not good enough from both Universities in the schools of nursing. Almost all the respondents disagreed with the

statement. Financial constraints may have been hindering the so much needed qualified University lecturers so that each teacher could have a normal teaching load.

In both Universities, lecturers believed that the procurement process for purchasing teaching materials was long and tedious. The statistical data showed that it takes too long to get approval for purchase of equipment in different offices where signatures for purchasing equipment are usually obtained i.e. 'long red tape'. The process needs to be shortened to prevent discouragement to those who are ordering for the supplies.

6.1.1.2 OBJECTIVE 2: To assess the perception of adequacy of learning resources in the MBChB and BScN programmes by students in the two Universities

Skills lab space plus the equipment were inadequate especially in University B. In University A - SON the students said that Skills Lab space is only enough when they were divided into groups. SOM students said that they have 3 skills labs and space was always enough when they were also divided into groups. The SOM students said that they only had one bed and one dummy for demonstrations.

In University B- SOM students stated that they don't really have a skills lab in their school but share a skills lab with the School of Nursing. They added that equipment for demonstrations was not enough due to large numbers of students e.g. there are only 6 BP machines for about 30 students.

University A - SON students stated that computers were not enough. They felt that the computer lab should be expanded and more computers added for the students. The SOM students said that there were only 15 working computers and they were not enough for all the students. Students have to use their own laptops.

In University B – SON students were disappointed by the fact that there were less than 50 computers for the entire College of Health Sciences. Most students had to use their own laptops. The SOM students also had a similar view that computers were not enough. They stated that only about 15 computers were in good working order and therefore most students had to use their own laptops.

6.1.1.3 OBJECTIVE 3: To identify the challenges encountered by lecturers in acquiring and utilizing teaching resources.

There was a reported shortage of lecturers in both Universities and in both schools. Lecturers reported that they were taking a heavier load of teaching than they ought to because there was shortage of lecturers in their schools. They also reported slow replacement of lecturers when they either retired or resigned from work, and this led to overwork especially if part time lecturers are not hired.

Regarding purchase of teaching equipment, there was a report of slow progress in getting approval signatures before purchase of equipment could be done.

6.1.1.4 OBJECTIVE 4: Compare the perceptions of adequacy of teaching/learning resources by lecturers and students between the two Universities.

Lecturers: There is inadequate classroom space for students especially in the Medical school in University B. Skills Labs are not adequately equipped with demonstration equipment. . In both Universities lecturers also reported a lot of sharing of teaching materials in their respective departments especially lecture rooms and LCD projectors in both Universities. In both Universities lecturers have a higher than normal teaching

load especially when their colleagues resigned or retired and the higher percentage were from University B.

Students: There is congestion in both lecture rooms and clinical placement areas by University B medical students who also stated that they did not have a skills lab of their own but were sharing the one in the School of Nursing. In University B also students stated that they needed new batteries on stand by for use when the ones in the microphone were used up. In both Universities there is shortage of computers in the computer labs. In University A, students complained of old library materials, especially text books and periodicals, and also few manikins in their skills labs. In both universities there were complaints of lecturer's time usage and students from University B complained of being inconvenienced by time for make - up classes.

6.3 RECOMMENDATIONS

6.1.1.5 OBJECTIVE 1: To assess the adequacy of teaching resources in the MBChB and BScN programmes by lecturers in the two Public Universities

- Administrators should make purchase of teaching/learning materials a priority in planning for the University.
- Increase the number of permanent lecturers in each School and departments so that the teaching load is manageable
- Replace lecturers within at least 3 months with people who have teaching experience or health education.
- Purchase lap tops for lecturers for class room use only.
- Lecturers should plan for their time out with students before they go for seminars, workshops and conferences and also ensure that make up classes are out of lunch break.
- More proposals should be written to NGOs requesting for donations of teaching/learning resources especially for students' computers and text books in University A.

6.1.1.6 OBJECTIVE 2: To assess the perceptions of adequacy of learning resources in the MBChB and BScN programmes by students in the two Universities

- Establish a skills lab for Medical students in University B urgently to avoid sharing with the School of Nursing. Their academic needs are different from those of nursing students.

- There is need to stock the University A library with new text books get new periodicals regularly, and do away with the old ones.
- There is need for better planning for diagnostic lab classes in order to reduce congestion.
- In both Universities in the colleges of Health Sciences, there is need to expand the computer labs and purchase new computers for the students.
- LCD projectors should be permanently fixed in each lecture room to reduce
- Numbers of Medical students should be reduced during intakes. This will reduce the need for microphones and also congestion during ward rounds.
- Spare batteries should be bought for the microphones for use in large theatres. It is important buy enough batteries for microphones that can last through all Trimesters in a year.
- Time management by lecturers in both Universities should be improved to reduce inconveniencing the students.
- New screens need to be purchased for use in the lecture theatres and the screens that have some marks on them should be thoroughly cleaned for better view of the projected learning content in University B.
- Purchase more manikins for Medical students in University A.
- Blinds or curtains should be put up to reduce light in the lecture rooms during LCD projection in both Universities.
- Increase the number of sockets in the Library for laptop use by students in both Universities.
- The use of SMART boards is encouraged in order to keep pace with the current technology.

6.1.1.7 OBJECTIVE 3: To identify the challenges encountered by lecturers in acquiring and utilizing teaching resources

- The administration should try and shorten the procurement process and signatures for purchase of teaching/learning resources.
- Planning for teaching/learning resources should be done before any student intake/admission so that the plan is based on the number of students.
- Engage more NGOs in donations of teaching/learning resources especially for students' computers and books for University A by writing proposals.
- The administration should try and shorten the procurement process and signatures for purchase of teaching/learning resources.

6.1.1.8 OBJECTIVE 4: To compare the perceptions of availability of teaching/learning resources by lecturers and students between the schools in the two Universities.

- Stock the library with new text books in University A
- Buy new manikins for Medical students in University A
- Time management by lecturers should be improved in both Universities.
- The computer labs in both SOM and SON need to be expanded and number of computers added in both Universities.
- Reduce number of students in the Medical School in University B
- Establish a Skills Lab for Medical students in University B to avoid sharing with BScN students in the School of Nursing with.
- Increase the number of lecturers in both Universities in order to ease the work load for lecturers

- Increase students' tuition and other relevant fees in in both Universities in order to complement the funds from the government to ensure that there is smooth running of the Universities.
- Add more business enterprises in order to earn more income that will boost the financial state of the Universities.
- Seek for more grants by writing many more proposals. Such grants can fund the libraries, Science labs, Skills Labs, Computer labs and other teaching facilities and equipment.

6.4 RECOMMENDATIONS FOR FURTHER RESEARCH

1. I recommend that an observational study of this research be done in the same or different Universities.
2. I also recommend a similar research to this one be done in private Universities in Kenya and other public universities in Kenya

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APPENDECIES

APPENDIX I: LETTER OF INTRODUCTION FROM MEDICAL EDUCATION DEPARTMENT, SCHOOL OF MEDICINE

Tel: 254 (0) 53-2060958/9
Fax: 254-(0) 53-2033041
Telex: 35047 MOIVARSITY
E-mail:
medicaleducation@ymail.com/
hodmededucation@mu.ac.ke

Moi Teaching & Referral Building
P.O. Box 4606
ELDORET,
KENYA.

MOI UNIVERSITY
COLLEGE OF HEATH SCIENCES, SCHOOL OF MEDICINE
MEDICAL EDUCATION DEPARTMENT

Ref: SOM/AC/ME/4 Date: 19th May 2016

TO WHOM IT MAY CONCERN

Dear Sir/Madam

RE: PhD STUDENT IN MEDICAL EDUCATION
MARY W NJERU REG.NO.SM.PhD/ME/02/14

The above named person is a registered PhD student in Medical Education Program at the Moi University's College of Health Sciences.

Mary has successfully completed her course work and passed all the courses in the first year of study. Mary is now in the data collection phase. In her research, she needs to collect data from two Public Universities. The topic of her thesis is ***"Determination of the Adequacy of Resources for Effective Implementation of Medical Education and their Enhancement in Teaching in two Selected Public Universities in Kenya".***

We highly appreciate any kind assistance accorded to her.

Yours faithfully

PROF. S. KANGETHE
HEAD, MEDICAL EDUCATION DEPARTMENT

APPENDIX II: LETTER TO THE NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION (NACOSTI)

The Director

NACOSTI

Utalii House

P.O. Box 30623 - 00100

Nairobi

Dear Sir

RE: REQUEST TO CONDUCT RESEARCH IN TWO SELECTED PUBLIC UNIVERSITIES IN KENYA

I am a PhD Medical Education student at Moi University. Am kindly requesting to be allowed to collect data in two Public Universities, namely: Moi University and University of Nairobi, in the schools of Medicine and Nursing.

My research title is: **Determination of the adequacy of Resources for effective implementation of Medical Education and their enhancement in teaching in two selected Universities in Kenya.**

My study participants are lecturers and student representatives from the schools of Medicine and Nursing.

Attached please find my formal approval from IREC of Moi University.

Yours Faithfully

Mary Njeru

STD No: SM/PhD.ME./02/14

Moi University

APPENDIX III: UNIVERSITY OF NAIROBI PERMISSIONLETTER 1

13. 06.2016

The Deputy Vice Chancellor

Research, Production and Extension

University of Nairobi

P.O. BOX 30197 - 00100

Nairobi

Dear Sir

RE: REQUEST FOR PERMISSION TO CONDUCT RESEARCH IN THE COLLEGE OF HEALTH SCIENCES, UNIVERSITY OF NAIROBI

I am PhD Medical Education student ofMoi University. I am kindly requesting to be allowed to collect data in the College of Health Sciences, specifically in the School of Medicine and the School of Nursing Sciences. My study participants are lecturers from the two schools and students' representatives from different classes.

My research title is: **Determination of the adequacy of** r**esources for effective implementation of Medical Education and their enhancement in teaching in two selected Public Universities in Kenya.**

Attached please find copies of my student's ID,letter of introduction, IREC approval letter fromMoi University and research permit from the National Commission for Science, Technology and Innovation (NACOSTI).

Yours Faithfully

Mary W. Njeru

STD No: SM/PhD.ME./02/14

Moi University

Phone No: **0722911083**; email address: njerumary3@gmail.com

APPENDIX IV: UNIVERSITY OF NAIROBI PERMISSIONLETTER2

14.03.2015

The Dean

School of Medicine

P.O. Box 30197

Nairobi

Dear Sir/Madam

RE: REQUEST FOR PERMISSION TO CONDUCT RESEARCH IN THE SCHOOL OF MEDICINE

I am PhD Medical Education student at Moi University. Am kindly requesting to be allowed to collect data in your school. My research title is: **Determination ofResources for implementation of Medical Education and their enhancement for effectiveness in teaching in two selected Public Universities in Kenya.**

My study participants are lecturers and student representatives from different classes.

Attached please find the written approval from IREC of Moi University.

Yours Faithfully

Mary Njeru

STD No: SM/PhD.ME./02/14

Moi University

APPENDIX V: UNIVERSITY OF NAIROBI PERMISSIONLETTER 3

14.03.2015

The Dean

School of Nursing

P.O. Box 30197

Nairobi

Dear Madam

RE: REQUEST FOR PERMISSION TO CONDUCT RESEARCH IN THE SCHOOL OF NURSING

I am PhD Medical Education student at Moi University. Am kindly requesting to be allowed to collect data in your school. My research title is: **Determination of theadequacy of resources for implementation of Medical Education and their enhancement for effectiveness in teaching in two selected Public Universities in Kenya.**

My study participants are lecturers and student representatives from different classes.

Attached please find the written approval from IREC of Moi University.

Yours Faithfully

Mary Njeru

STD No: SM/PhD.ME./02/14

Moi University

APPENDIX VI: IREC FORMAL APPROVAL LETTER

INSTITUTIONAL RESEARCH AND ETHICS COMMITTEE (IREC)
MOI TEACHING AND REFERRAL HOSPITAL
P.O. BOX 3
ELDORET
Tel: 33471/2/3

MOI UNIVERSITY
SCHOOL OF MEDICINE
P.O. BOX 4606
ELDORET

Reference: IREC/2015/68
Approval Number: 0001444

5th August, 2015

Ms. Mary Njeru,
Moi University,
School of Medicine,
P.O. Box 4606-30100,
ELDORET-KENYA.

Dear Ms. Njeru,

RE: FORMAL APPROVAL

The Institutional Research and Ethics Committee has reviewed your research proposal titled:-

"Determination of the Adequacy of Resources for Effective Implementation of Medical Education and their Enhancement in Teaching in Two Selected Public Universities in Kenya."

Your proposal has been granted a Formal Approval Number: ***FAN: IREC 1444*** on 5th August, 2015. You are therefore permitted to begin your investigations.

Note that this approval is for 1 year; it will thus expire on 4th August, 2016. If it is necessary to continue with this research beyond the expiry date, a request for continuation should be made in writing to IREC Secretariat two months prior to the expiry date.

You are required to submit progress report(s) regularly as dictated by your proposal. Furthermore, you must notify the Committee of any proposal change (s) or amendment (s), serious or unexpected outcomes related to the conduct of the study, or study termination for any reason. The Committee expects to receive a final report at the end of the study.

Sincerely,

PROF. E. WERE
CHAIRMAN
INSTITUTIONAL RESEARCH AND ETHICS COMMITTEE

cc Director - MTRH Dean - SOP Dean - SOM
Principal - CHS Dean - SON Dean - SOD

APPENDIX VII: LETTER OF APPROVAL FROM NACOSTI

NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION

Telephone:+254-20-2213471,
2241349,3310571,2219420
Fax:+254-20-318245,318249
Email:dg@nacosti.go.ke
Website: www.nacosti.go.ke
when replying please quote

9th Floor, Utalii House
Uhuru Highway
P.O. Box 30623-00100
NAIROBI-KENYA

Ref. No. **NACOSTI/P/16/75841/9748**

Date: **13th June, 2016**

Mary Wamiru Njeru
Moi University
P.O. Box 3900-00100
ELDORET.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on ***"Determination of adequacy of resources for effective implementation of medical education and their enhancement in teaching in two selected universities in Kenya,"*** I am pleased to inform you that you have been authorized to undertake research in **Nairobi and Uasin Gishu Counties** for the period ending **13th June, 2017.**

You are advised to report to **the Vice Chancellors of selected Universities, the County Commissioners and the County Directors of Education, Nairobi and Uasin Gishu Counties** before embarking on the research project.

On completion of the research, you are expected to submit **two hard copies and one soft copy in pdf** of the research report/thesis to our office.

BONIFACE WANYAMA
FOR: DIRECTOR-GENERAL/CEO

Copy to:

The Vice Chancellors
Selected Universities.

The County Commissioner
Nairobi County.

APPEDIX VIII: RESEARCH PERMIT FROM NACOSTI

THIS IS TO CERTIFY THAT:
MS. MARY WAMIRU NJERU
of MOI UNIVERSITY, 0-30100 ELDORET,has been permitted to conduct research in *Nairobi, Uasin-Gishu Counties*

on the topic: *DETERMINATION OF ADEQUACY OF RESOURCES FOR EFFECTIVE IMPLEMENTATION OF MEDICAL EDUCATION AND THEIR ENHANCEMENT IN TEACHING IN TWO SELECTED UNIVERSITIES IN KENYA*

for the period ending:
13th June,2017

Permit No : NACOSTI/P/16/75841/9748
Date Of Issue : 13th June,2016
Fee Recieved :ksh 2000

.....
Applicant's Signature

.....
Director General
National Commission for Science, Technology & Innovation

APPENDIX IX: LETTER TO REQUEST FOR DATA COLLECTION FROM UNIVERSITY OF NAIROBI

13. 06.2016

The Deputy Vice Chancellor

Research, Production and Extension

University of Nairobi

P.O. BOX 30197 - 00100

Nairobi

Dear Sir

RE: REQUEST FOR PERMISSION TO CONDUCT RESEARCH IN THE COLLEGE OF HEALTH SCIENCES, UNIVERSITY OF NAIROBI

I am PhD Medical Education student of Moi University. I am kindly requesting to be allowed to collect data in the College of Health Sciences, specifically in the School of Medicine and the School of Nursing Sciences. My study participants are lecturers from the two schools and students' representatives from different classes.

My research title is: **Determination of the adequacy of** r**esources for effective implementation of Medical Education and their enhancement in teaching in two selected Public Universities in Kenya.**

Attached please find copies of my student's ID, letter of introduction, IREC approval letter from Moi University and research permit from the National Commission for Science, Technology and Innovation (NACOSTI).

Yours Faithfully

Mary W. Njeru

STD No: SM/PhD.ME./02/14

Moi University

Phone No: **0722911083**; email address: njerumary3@gmail.com

APPENDIX X: PERMISSION LETTER FROM UON

UNIVERSITY OF NAIROBI
OFFICE OF THE DEPUTY VICE - CHANCELLOR
(Research, Production & Extension)
Prof. Lucy W. Irungu B.Sc., M.Sc., Ph.D.

P.O. Box 30197-GPO.
00100,Nairobi-Kenya
Telephone: +254-20-2315416 (DI), 318262

Fax:0202317251
Email:dvcrpe@uonbi.ac.ke

UON/RPE/3/5/XVI/

June 24, 2016

Dean SoM
Director SoNS
Endorsed. Facilitate.
5/7/16

Ms. Mary Njeru
Moi University
School of Medicine
P.O. Box 4606 – 30100
Eldoret

Dear Ms. Njeru

APPROVAL TO COLLECT DATA

Approval is hereby, granted for you to collect data in the College of Health Sciences, University of Nairobi for your research entitled "***Determination of the adequacy of resources for effective implementation of Medical Education and their enhancement in teaching in two selected public universities in Kenya***".

Upon completion of your study, you are expected to share the findings of your study with the University of Nairobi by depositing a copy of your research findings with the Director, Library & Information Services.

Yours Sincerely

LUCY W. IRUNGU
DEPUTY VICE-CHANCELLOR
(RESEARCH, PRODUCTION AND EXTENSION)
&
PROFESSOR OF ENTOMOLOGY

cc. Vice-Chancellor
Deputy Vice-Chancellor (AA)
Deputy Vice-Chancellor (A&F)
Deputy Vice-Chancellor (SA)
✓Principal, College of Health Sciences
Director, Library and Information Services
Registrar, Administration

APPENDIX XI: INFORMED CONSENT FORM

The researcher's name is Mary Njeru, a PhD Medical Education student at Moi

Adequacy of teaching resources for implementation of Medical Education and their enhancement in teaching for effectiveness in two selected Public Universities in Kenya.

You as a participant in this study are required to either respond in writing to a structured questionnaire or respond orally to an interview in a focus group discussion. The focus group discussion will be audio-taped because the researcher cannot remember all the information obtained off head and writing down the information during the discussion may not be practical.

The information obtained in this study will be held totally confidential. You do not have to write your name or the name of your University on any of the questionnaires for the purpose of anonymity. In the focus group discussion do not mention your name or the name of your University. Answer the interview questions as precisely as you can.

There is no harm that this study intends to do on you as an individual, school or institution. The only benefit the researcher has identified in this study is the proposed recommendations that the researcher will come up with to try and improve on identified problems on completion of the study.

You are free to withdraw from this study when you deem it necessary.

Participant: I have understood the above information and out of my own will I accept to participate in this study.

Signature: …….. Date: ……

APPENDIX XII: STRUCTURED QUESTIONNAIRE
PART A: AVAILABILITYOF TEACHING RESOURCES

INSTRUCTION: TICK 'YES' OR 'NO' AS YOUR RESPONSE

1. Do you believe that there are enough teaching resources in your school?

   Yes ☐ No ☐

2. When you consider classroom space as compared to the number of students they have to accommodate, is the space adequate?

   Yes ☐ No ☐

3. Do you have all the instructional materials that you require for teaching in the classroom?

   Yes ☐ No ☐

4. Is your skills Lab well equipped for all the demonstrations required to teach skills?

   Yes ☐ No ☐

5. Is the number of computers in the computer lab adequate enough for the students in terms of ratios i.e. no of students per computer?

   Yes ☐ No ☐

6. Is connectivity of internet in the school reliable for both lecturers and students?

   Yes ☐ No ☐

7. When you compare the workload and the number of lecturers, are the proportions good

   enough?

   Yes ☐ No ☐

8. The lecturers in this school do not teach in any other school in the college of health sciences

Yes ☐ No ☐

9. Every lecturer can access an LCD projector whenever they have a class to teach

   Yes ☐ No ☐

10. The University owns laptops that are for use by lecturers for teaching

    Yes ☐ No ☐

11. Our University receives teaching equipment and other materials from donor NGOs.

12. Yes ☐ No ☐

13. The University Learning Resource Center (Library) is well equipped with current text books and periodicals for lecturers and students' use

    Yes ☐ No ☐

14. All lecturers report to their lecture rooms on time to teach

    Yes ☐ No ☐

15. Most students are usually in class before a lecturer arrives to teach

    Yes ☐ No ☐

16. There is a penalty for students who do not attend the lectures that they have registered for.

    Yes ☐ No ☐

PART B: ACQUISITION AND UTILIZATION OF TEACHING RESOURCES

INSTRUCTION: In this section TICK under the evaluation term that corresponds to your response.

5 = Strongly Agree; 4 = Agree; 3 = Not Sure; 2 = Disagree 1 = Strongly Disagree

RESEARCH STATEMENT	**5** Strongly Agree	**4** Agree	**3** Not Sure	**2** Disagree	**1** Strongl Disagre
1. When lecturers resign or retire they are always replaced within three months.					
2. When replacing lecturers, it is very possible to get a person with teaching experience at University level.					
3. When new teaching equipment is to be purchased the protocol is simple and straight forward.					
4. Good quality equipment is purchased by the procurement office when ordered.					
5. The process of obtaining signatures in the procurement process of teaching materials is long and tedious.					
6. There is a lot of sharing of teaching materials in this University.					

7. Sharing of teaching materials does not inconvenience any lecturer because there is proper prior planning of use.

8. Sharing of lecture rooms does not inconvenience any lecturer because there is a clear time-table on use of University rooms.

9. Internet connectivity for lecturers and students is reliable and efficient throughout the semester.

PART C: THE ROLE OF ADMINISTRATORS IN ACQUIRING AND MAINTAINING ADEQUATE NUMBERS OF TEACHING RESOURCES

INSTRUCTION: In this section TICK under the evaluation term that corresponds to your response.

5= Always; 4= Most of the time; 3= Not sure; 2= Sometimes; 1= Never

RESEARCH STATEMENT	**5** Always	**4** Most of the time	**3** Not Sure	**2** Sometimes	**1** Never
1.The administrators of the University usually make the initiative to replace lecturers who have resigned or retired.					
2. The administrators are very concerned about the new workload for the remaining lecturers after a lecturer has left the University.					
3. Administrators are very keen to ensure that the Learning Resource Centre (Library) is well equipped with the most current text books and periodicals.					

4. During the procurement process of new equipment, administrators provide full support in acquiring the new items.

5. Signatures from administrators are easy to obtain during the procurement process.

6. When equipment breaks down, the administrators offer full support in its maintenance or replacement.

7. The crowding of students in lecture rooms is a big concern to all administrators.

8. The administrators often communicate with lecturers regarding plans to construct new lecture rooms as the number of students increase.

9. The administrators have placed mechanisms to ensure that the absence of a lecturer who is supposed to be in a class on a particular day or time is noted.

PART D: STATE OF THE CURRENT SITUATION

INSTRUCTION: Select and CIRCLE the most appropriate letter response from amongst the following options.

1. What is your opinion regarding the current situation on teaching resources?
    a. The situation will improve
    b. There is possibility of a status quo for a while
    c. The situation is likely to get worse
    d. It is not possible to predict

    Other specify _____
2. The number of students in this school is most likely going to:
    a. Increase further in the next few years
    b. Decrease in the next few years
    c. Maintain a constant number
    d. It is difficult to predict
3. Regarding the resources in the Learning Resource Centre (Library), the following is most likely to take place in the near future

    a. There is likely to be a great improvement
    b. There may be some stagnation or equilibrium
    c. There is little hope of improvement
    d. It is difficult to predict
4. The teaching resources for lecture rooms and skills lab in this school are most likely going to be:

a. Increased through purchase of new ones
b. Repaired so that they are functional again
c. Remain the same till further notice
d. It is difficult to predict

5. Regarding the lecturer numbers in this school:
    a. More lecturers will be employed
    b. The number of lecturers will remain the same
    c. There is possibility of number of lecturers reducing
    d. It is difficult to predict
6. The number of computers for students in the computer labs are most likely going to:
    a. Increase in number
    b. Remain the same for a while
    c. Be repaired
    d. It is difficult to predict
7. Internet connectivity in the school is most likely going to:
    a. Improve in coverage
    b. Remain the same
    c. Decline in capacity
    d. It is difficult to predict

APPENDIX XIII: INTERVIEW GUIDE FOR STUDENTS' FOCUS GROUPS

1. According to your own assessment, do you have adequate space in your lecture room?
2. Do you have enough learning space in your skills lab?
3. Are the learning resources in your lecture room enough?
4. Are there enough equipment and instruments for learning procedures in your skills lab
5. What are the audio-visual aids that your teachers use in the lecture room during teaching?
6. Do you think teachers are managing their time properly when teaching you?
7. What type of equipment do you have in your skills lab for learning different skills?
8. Do you have a computer lab? If so do you think these computers are enough for all students?
9. Which other resources would you like to see in your lecture room?
10. Do you have any idea why the situation is the way it is regarding learning resources?
11. What are your suggestions regarding the current situation and how it can be changed?
12. How is the stocking of your University's library in terms of books, journals and other periodicals?

APPENDIX XIV: RESEARCH TIME FRAME, 2016

Activity	Februar y	Marc h	Apri l	Ma y	Jun e	Jul y	Augus t	Sep t	Oct o
Proposal Developmen t									
Submission of proposal to IREC									
Proposal defense									
Soliciting for research funds									
Pilot study									
Analysis of pilot study data									
Conduct main study									
Data Analysis									
Report writing									

APPENDIX XV: RESEARCH BUDGET

ITEM/ACTIVITY	COST
▪ Fuel cost to and from University of Nairobi	**Ksh 12,000**
▪ Fuel cost to and from Moi University	**Ksh 4,000**
▪ Accommodation and meals in Nairobi	**Ksh 21,500**
▪ Stationary : printing paper, cartridge, IREC folders, binding proposal document, pens	**Ksh 20,000** **Ksh 5,000**
▪ Photocopying charges	**Ksh 20,000**
▪ Pilot study costs at Maseno University	**Ksh 20, 000**
▪ Tape recorder for focus groups	**Ksh 4,000**
▪ Incentives for research assistants	**Ksh 2,000**
▪ Incentives for student participants	**Ksh 1,000**

▪ Airtime for making appointments	**Ksh1,000**
▪ IREC Charges	**Ksh 20,000**
▪ Binding theses	**Ksh 5,000**
▪ Cost of consultation with statistician	**Ksh 135,500**
TOTAL	

APPENDIX VI: PUBLICATIONS

International Academic Journal of Health, Medicine and Nursing | Volume 2, Issue 1, pp. 26-35

PERCEPTIONS OF THE ADEQUACY OF TEACHING AND LEARNING RESOURCES FOR UNDERGRADUATE MEDICINE (MBCHB) AND NURSING (BSCN) PROGRAMMES IN TWO KENYAN PUBLIC UNIVERSITIES

Njeru M.

PhD Finalist, Moi University, Kenya

Kang'ethe S.

Moi University, Kenya

Kwena A.

Moi University, Kenya

Otieno C. A.

Moi University, Kenya

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Published: 13th January 2020

Full Length Research

Available Online at:http://www.iajournals.org/articles/iajhmn_v2_i1_26_35.pdf

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ABSTRACT

High students' intake in Public Universities has led to reduced learning space and sharing of few teaching/learning resources by both lecturers and students. The purpose of this study was to assess the adequacy of teaching and learning resources for effective implementation of the MBChB and BScN programmes in two public universities in Kenya. The specific objectives of this study were to assess the perceptions of the adequacy of teaching resources in the MBChB and BScN programmes by lecturers, assess the perceptions of the adequacy of learning resources by students in the MBChB and BScN programmes, identify the challenges encountered by lecturers in acquiring teaching resources and compare the perceptions of adequacy of teaching resources in both Universities. The study was conducted in Moi University (A) and University of Nairobi (B). The study design used was mixed methods research design. Convenience (non-probability) sampling was used to select 100 University lecturers (50 from each university) and 50 from each school as participants of the study. Purposive sampling was used to select students for Focus Group Discussions. 38 students' representatives in the MBChB and BScN programmes (2 representatives per academic year) were interviewed using an interview guide. There were four Focus Group Discussion (FGD) groups with 8 to 10 students per FGD. Data was collected from university lecturers of the MBChB and BScN programmes in the two Universities, using self-administered closed-ended structured questionnaires. Findings from both Universities showed that 88% of lecturers perceived that teaching resources were inadequate, 77% perceived that lecture room space was inadequate and 84% that skills labs were not well equipped. FGDs revealed that students. A comparison between the two Universities revealed that University A had better equipped skills laboratories while University B had a better stocked library. Conclusion: there are inadequate Teaching/learning resources in public Universities which are attributed to high student intakes and financial constraints.

Key Words: *perceptions, adequacy, teaching/learning resources, lecturers, students*

INTRODUCTION

In order for effective learning to take place in any learning institution, there must be enough resources to facilitate learning (Amri et al., 2005). Teaching and learning resources are very important in Health Education. According to Mutema et al., (1999), learning resources play a major role in problem-based learning. Apart from availability of learning resources, adequacy, relevance and usability of such resources are very critical in teaching/learning situations (Mutema et al., 1999).

There are five major categories of teaching/learning resources. The first category is that of human resource which includes administrative team, lecturers and support staff. The second category includes learning resources like audiovisual aids including projectors, books and periodicals (Quinn and Hughes, 2007). The third category is physical plant or classroom

space and also includes satellite campuses and practical facilities for (Kibore et al, 2015). The fourth type of resource that all other resources depend on is financial resources. The two main categories of financial resources include capital budget and operating budget (Tappen, 2001). The fifth type is time as a resource (Locke, 2018). Though not always viewed as a resource, it is very necessary that instructors plan time for their students, not only for classroom instruction but also for individual couching.

Adequate teaching and learning resources refer to the availability of the above mentioned resources for students' learning. For every group of students there must be well qualified lecturers, adequate classroom space for a specified number of students, science labs, skills lab, computer lab and a well-equipped library (Amri et al., 2005). In addition to this, every lecture room should have enough teaching aids for use by teachers including Chalk boards/white boards, Overhead projectors, Laptops, Liquid Crystal Display (LCD) projectors, Screens and Flipcharts. If any lecture room falls short of these requirements, then there is inadequacy of teaching resources (Mbirithi, 2013).

A study done in University of Minnesota (USA) revealed that students who studied in a technologically enhanced classroom with large projector screens and marker boards had higher assessment scores compared to those who were taught in a traditional classroom (Perks et al, 2016).

Another study done by Adeoye and Popoola (2011) in Nigeria revealed that the Schools of Nursing had what they called 'libraries' but not all were established libraries in terms of resources. This led to lower academic standards of the students than what was expected. Another study done by Gudo (2011) on issues of quality education in private and public Universities revealed that public Universities did not have adequate physical facilities and other teaching resources for offering services to their students (Gudo et al, 2011).

According to the Kenyan Nation newspaper dated 3rd October, 2015, there are a number of important challenges facing Universities in Kenya. These include the demand for access and social equity, funding and the cost to students in terms of fees, governance and internal management, the changing roles of academics, demographic changes among academics, inefficiency and ethnicity.

BROAD OBJECTIVE

The purpose of this study was to assess the challenges that MBChB and BScN lecturers in Public Universities face in acquiring and utilizing teaching and learning resource.

SPECIFIC OBJECTIVES

1. To assess the perceptions of adequacy of teaching resources in the MBChB and BScN programmes by lecturers in the two Public Universities.
2. To Identify the challenges encountered by lecturers in acquiring and utilizing teaching resources.
3. Compare the perceptions of the adequacy of teaching and learning resources by lecturers and students between the two Schools in the two Universities.

PROBLEM STATEMENT

The number of students in health education is growing rapidly in Public Universities. As these numbers continue to increase this has led to problems like crowding in classrooms, libraries, computer labs and inadequate laboratory facilities (Ngatia et al., 2009). Libraries are also not well equipped with the current textbooks and journals. Learning resources remain limited and therefore do not correspond to the number of students. The ratio of the number of students per lecturer shows that one particular lecturer has to take care of a large number of students. The commission for University Education (CUE) and the Kenya Medical Practitioners and Dentists Board recommend adequate classroom space, science labs, skills labs, enough lecturers and adequate teaching resources for effective learning to take place. The Nursing Council of Kenya (NCK) recommends a ratio of ten students per clinical instructor and 40 students per class (Ogeng'o, 2015). Recruitment of lecturers does not match the increase in the number of students which should actually be the case (Momanyi, 2015). Clinical sites, especially hospitals are also getting crowded with the increasing number of students, therefore hospitals and other health facilities need to plan for more students for clinical experience than the ones they planned for before (Lippincott, 2017). Due to these challenges, learning is no longer of the preferred quality according to the required standards.

LITERATURE REVIEW

Teaching and learning resources are all items or combination of items which enhance teaching and learning. They are the backbone for teaching and training health care professionals (Ngatia et al., 2009).

Types of Teaching Resources

There are five main categories of teaching resources.

1. The first category is that of human resource which includes administrators, lecturers and support staff.
2. The second category includes teaching resources including projectors, books and periodicals (Quinn and Hughes, 2007).

3. The third category is physical plant or classroom space and also includes satellite campuses and practical facilities for students.
4. The fourth type is financial resources which includes capital budget and operating budget (Tappen, 2001).
5. The fifth type is time as a resource.

Availability of Teaching Resources

In order for effective teaching and learning to take place there has to be enough resources. Every teacher should aim at giving the best to his/her students in order to enable them to remember and practice what they have been taught.

Teaching and learning resources are the backbone for teaching and training health care professionals. They enhance acquisition of relevant knowledge and skills, facilitate the delivery of information and influence development of attitudes (Ngatia et al., 2009).

Teaching resources for enhancing cognitive learning are divided into two main categories:

1. Projected aids
2. Non-projected aids

Examples of projected aids include the Overhead projector (OHP), Kaleidoscopes, films, video cassettes and slides. These teaching aids are the ones commonly used Universities. Non-projected aids include the chalkboard, white board, magnetic boards, pictures, Flipcharts, posters, handouts, flannel boards and 'the real thing' including food substance (Amri et al., 2005). All these teaching resources enhance understanding of information which in Bloom's Taxonomy is in the cognitive domain. A very important teaching resource for health professionals is a skills lab. A skills laboratory is a learning resource centre that provides an environment for learning clinical skills where students can practice without jeopardizing patient care or provoking adverse effects. It reduces the difficulties experienced by students when they first encounter patients in wards and clinics and improves procedural skills (Omaswa et al., 2014).

Teaching resources that enhance acquisition of skills and attitudes include the following:

1. Manikins of different types including adult male/female, child, baby doll etc.
2. Different types of instruments including dressing forceps, dissecting forceps, artery forceps, retractors etc.
3. Hospital beds and coaches, trolleys of different kinds Mayo's trolley, dressing trolley

4. Trays of different kinds including catheterization tray, stitch-removing tray, the General set tray, delivery tray etc.
5. Computers, printers and scanners

All these resources help students to learn by doing things practically thus attaining proficiency in skill. Every school and department should have enough teaching resources in order to facilitate students' learning. As the numbers of university students continue to grow rapidly there is need to also increase teaching resources so as to cater for them effectively.

Without appropriate teaching and learning materials, health care professionals encounter many problems in training and practice. Even when the materials are available there is need for periodic review and production of new ones (Ngatia et al., 2009).

Instructional resources are not only expected to be available to sufficient levels to enable teaching and learning to properly take place. They should be adequate enough for utilization in teaching and learning (Igwe in Martin's Library, 2004).

RESEARCH METHODOLOGY

This study used a mixed methods study design. Sampling of the participants employed convenience sampling. Convenience (accidental) sampling was used as a non-probability method of sampling and involved readily available people or objects for a study (Nieswiadomy, 2010). In convenience sampling, available subjects are simply entered into the study until the desired sample size is reached (Burns and Grove, 2005). The reason why convenience sampling was used is because lecturers are not always in their offices when one may need to see them. They could be in class or instructing students in the clinical areas. The study was conducted in two Kenyan Public Universities namely Moi University (University A) and University of Nairobi (University B), in the Schools of Medicine and Nursing. A sample size of 50 lecturers was selected from each University to participate in the study from the School of Medicine and School of Nursing. Data collection for the quantitative part of the study was done using closed-ended structured questionnaires. The drop and pick method was used to administer the structured questionnaires to the lecturers. Qualitative data was obtained from purposively selected 38 students' representatives in the MBChB and BScN programmes (2 representatives per academic year) using an interview guide. There were four Focus Group Discussion (FGD) groups with 8 to 10 students per FGD. Quantitative data was coded and entered into Microsoft Excel Spread-sheets. It was later analyzed using SPSS version 22 by frequencies, means and percentages and then presented using prose, tables, pie charts and graphs. Qualitative data was coded and analyzed contextually (Creswell, 2008). Qualitative data obtained from focus groups was

transcribed from the recorded audio tapes. The researcher listened to the audio-tapes and transcribed the data into a transcript. The transcript was then summarized and put into context. After this ideas were organized into patterns and trends that constituted the themes.

RESEARCH RESULTS

76.6% of lecturers from both Universities perceived that classroom space was inadequate when compared to the number of students that they taught. Majority of the lecturers from both Universities (88%) felt that they did not have enough instructional materials for use in teaching. 84% of lecturers from both universities perceived that their skills labs were not well equipped. Most lecturers from both universities felt that students did not have enough computers at 88%. In both Universities, 91% of lecturers felt that the proportion of workload was not good as compared to the number of lecturers. Majority of the lecturers (77%) disagreed that lecturers are replaced within 3 months when they leave the University. Lecturers also perceived that there is a lot of sharing of teaching materials in their Universities at 69%. Majority of lecturers from both Universities stated that they are inconvenienced by sharing of teaching materials at 62.5%.

A comparison between the two Universities revealed that students from University A perceived that the library had old text books and few students' computers, and there were little equipment in the skills laboratories. 80% of the students in University B reported crowding in classrooms and clinical sites, and needed more computers in the library. Medical students in University B stated that they did not have a skills laboratory of their own but shared the one in the School of Nursing. A further comparison between the two Universities indicated that University A had better equipped skills laboratories while University B had a better stocked library.

Qualitative data was coded and analyzed contextually (Creswell, 2008). This data which was obtained from Focus Groups was transcribed from the recorded audio tapes. The researcher listened to the audio-tapes and transcribed the data into a transcript. The transcript was then summarized and put into context. After this ideas were organized into patterns and trends that constituted the themes.

Theme 1: Adequacy of space and learning resources in the lecture rooms

Theme 2: Adequacy of space and learning resources in the Skills Lab

Theme 3: Adequacy of computers in the computer labs

Theme 4: Adequacy of library stocking for current text books, journal and periodi
cals

Theme 5: Time Management by lecturers

DISCUSSION OF THE FINDINGS

It was evident from this study that teaching resources were inadequate in both Universities. Classroom space was a major concern in the University B at the School of Medicine. This was attributed to high numbers of students' admissions. Other teaching resources that lecturers perceived to be inadequate included the number of lecturers themselves, Skills Laboratory equipment, computers for students in the computer labs. Lecturers also perceived that it was necessary for the Universities to own some laptops for use by lecturers in class just like the LCD projectors. Some lecturers also felt that there was need to increase the number of LCD projectors in the University to avoid too much sharing of the same.

These findings are in line with a study carried out by Gudo et al., (2011) that revealed that both private and public Universities had lack of enough lecture rooms and this hindered effective teaching and learning.

The findings are challenged by a study done by Rokni and Karimi (2013) who found that the use of visual materials or visual elements in teaching and learning had a positive result because use of visual aids helps to improve students' learning in several ways.

This inadequacy of teaching and learning resources could be attributed to financial constraints that public Universities in Kenya have been experiencing. Admitting large number of students with scarce financial resources leads to inadequacy of teaching resources. The Kenyan Daily Nation Newspaper of Wednesday March 14, 2015 wrote that 16 Public Kenyan Universities were experiencing deep financial crisis and therefore the quality of education they were offering was questionable (Wanzala, 2015).

Lecturers believed that the process of trying to acquire new teaching equipment was long and tedious. This is mainly attributed to the many signatures that must be obtained from signatories in procurement process is long and tedious makes acquisition of materials and equipment difficult or slow.

Majority of the lecturers also stated that the replacement of lecturers too longer than three months.

Lecturers are the main type of human resource that is engaged in teaching.

This could be attributed to the duration of the recruitment process which requires shortlisting and interviewing of prospective workers. It could also be attributed to the financial constraints that most public Universities are experiencing.

CONCLUSION

There were inadequate teaching resources in both Universities which included classroom space and poorly equipped skills laboratories. There was congestion of students in classrooms (University B), poorly equipped skills laboratories, inadequate number of computers and old text books (University A). Financial constraints in Public Universities coupled with high students' admissions may be the main contributing factor to resource inadequacy.

RECOMMENDATIONS

1. Numbers of Medical students especially in University B should be reduced during admissions. This will reduce the need for many microphones in lecture halls and also congestion during ward rounds.
2. Establish a skills lab for Medical students urgently in University B to avoid the sharing with school of Nursing. This is because their academic needs of the two groups are different.
3. Purchase more manikins for Medical students in University B in the skills Laboratories.
4. Increase the number of permanent lecturers in each department so that work load is lighter
5. There is need to stock the library in University A with new text books and do away with the old ones.
6. In both Universities there is need to expand the computer labs and purchase new computers for the students.
7. Replace lecturers within 3 months with people who have teaching experience or Medical education.
8. Purchase lap tops for lecturers for class room use only.
9. Lecturers should plan for their time out with students before they go to seminars and conferences and make up classes be out of lunch hour.
10. There is need for better planning for diagnostic lab classes in order to reduce congestion.
11. Spare batteries should be bought for the microphones for use in large theatres. It is important to buy enough batteries for microphones that can last through all Trimesters in a year.
12. Engage more NGOs in donations of teaching/learning resources especially students' computers and books for University A.

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Perceptions of the Adequacy of Learning Resources by Undergraduate Medical and Nursing Students in Two Kenyan Public Universities

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Abstract: High students' intake in Public Universities has led to reduced learning space and sharing of few teaching/learning resources by both lecturers and students. The purpose of this study was to assess the perceptions of adequacy of learning resources in the MBChB and BScN programmes by students. The study was conducted in Moi University (A) and University of Nairobi (B). The study design was Qualitative Phenomenological study. Purposive sampling was used to select 38 students' representatives in the MBChB and BScN programmes. Two students' representatives were selected per each academic year. There were four Focus Group Discussion (FGD) groups with 8 to 10 students per FGD. Data was collected using a structured interview guide. FGD results revealed that many students from A perceived that the library had old text books and few students' computers; and there was little equipment in the skills

laboratories. Majority of the students in B reported crowding in classrooms and clinical sites**,** and needed more computers in the library. Medical students in B also stated that they did not have a skills laboratory of their own but shared one with the School of Nursing. Conclusion: There are Inadequate Learning resources in Public Universities Which are Attributed to High Student Intakes and Financial Constraints

Keywords: Perceptions, Adequacy, Learning Resources, Students

Introduction

For effective learning to take place in any academic institution, there must be adequate resources to facilitate learning [1]. High student intakes in Public Universities have led to reduced learning space and sharing of few teaching and learning resources by students. This has led to crowding in classrooms, laboratories, libraries and clinical placement sites.

Problem Statement

The number of students in health education is growing rapidly in Public Universities. As these numbers continue to increase this has led to problems like crowding in classrooms, libraries, computer labs and inadequate laboratory facilities [9]. Libraries are also not well equipped with the current textbooks and journals. Learning resources remain limited and therefore do not correspond to the number of students. The ratio of the number of students per lecturer shows that one particular lecturer has to take care of a large number of students.

Recruitment of lecturers does not match the increase in the number of students which should actually be the case [8] Clinical sites, especially hospitals are also getting crowded with the increasing number of students, therefore hospitals and other health facilities need to plan for more students for clinical experience than the ones they planned for before.

Purpose of the Study

The purpose of this study was to assess the perceptions of the adequacy of learning resources for effective implementation of the MBChB and BScN programmes by students in two Public Universities in Kenya.

Study Setting

The study was conducted in Moi University (University A and University of Nairobi (University B) in the Schools of Medicine (SOM) and the Schools of Nursing (SON).

Research Questions

What are the perceptions of Medical students regarding adequacy of learning resources in the MBChB programme in the two public Universities?

What are the perceptions of Nursing students regarding adequacy of learning resources in the BScN programme in the two public Universities?

Literature Review

Teaching and learning resources are all items or combination of items which enhance teaching and learning. They are the backbone for teaching and training health care professionals [*9*].

Types of Teaching Resources

There are five main categories of teaching resources.

i. The first category is that of human resource which includes administrators, lecturers and support staff.

3. The second category includes teaching resources including projectors, text books and periodicals [12].

iii. The third category is physical plant which includes classroom and laboratory space; and also satellite campuses and clinical facilities for students.

6. The fourth type is financial resources which include capital budget and operating budget for running the institution [13].

7. The fifth type is time as a resource. Time use is important both to the lecturers and students.

Availability of Teaching Resources

In order for effective teaching and learning to take place, there has to be enough resources. Every teacher should aim at giving the best to his/her students in order for them to remember and practice what they have been taught.

Teaching and learning resources are the backbone for teaching and training health care professionals. They enhance acquisition of relevant knowledge and skills, facilitate the delivery of information and influence development of attitudes [9].

Teaching resources for enhancing cognitive learning are divided into two main categories:

12. Projected aids

13. Non-projected aids

Examples of projected aids include the Overhead projectors (OHPs), LCD projectors, LED projectors, DLP projectors, Kaleidoscopes, films, video cassettes and slides. These teaching aids are the ones commonly used Universities though preference of each depends on the specific institution.

Non-projected aids include the chalkboard, white board, magnetic boards, pictures, Flipcharts, posters, handouts, flannel boards and 'the real thing' including food substance

13. All these teaching resources enhance understanding of information which in Bloom's Taxonomy is in the cognitive domain.

A very important teaching resource for health professionals is a skills lab. A skills laboratory is a learning resource centre that provides an environment for learning clinical skills where students can practice without jeopardizing patient care or provoking adverse effects. It reduces the difficulties experienced by students when they first encounter patients in wards and clinics and improves procedural skills [10].

Teaching resources that enhance acquisition of skills and attitudes include the following:

i. Manikins of different types including adult male/female, child, baby doll etc.

ii. Different types of instruments including dressing forceps, dissecting forceps, artery forceps, retractors etc.

iii. Hospital beds and coaches, trolleys of different kinds like Mayo's trolley and dressing trolley

iv. Trays of different kinds including catheterization tray, stitch-removing tray, the General set tray, delivery tray etc. v. Computers, printers, scanners and photocopying machines.

All these resources help students to learn by doing things practically thus attaining proficiency in skill.

Every school and department should have enough teaching/learning resources in order to facilitate students' learning. As the numbers of University students continue to grow rapidly, there is need to also increase teaching resources in order to cater for them effectively.

Without appropriate teaching and learning materials, health care professionals encounter many problems in training and practice. Even when the materials are available there is need for periodic review and production of new ones

Instructional resources are not only expected to be available to sufficient levels to enable teaching and learning to properly take place, they should be adequate enough for utilization in teaching and learning [4

Research Methodology

The study design used was Qualitative Phenomenological study. The research was conducted in two public Universities in the Schools of Medicine (SOM) and Schools of Nursing (SON). Data was obtained from 38 purposively selected students' representatives in the MBChB and BScN programmes (2 representatives per academic year) using a structured interview guide. The students were placed in four groups for Focus Group Discussion (FGD) with 8 to 10 students per FGD. MBChB and BScN students were interviewed separately due to their different and unique learning needs.

Research Findings

Qualitative data from FGDs was transcribed, contextual narratives written and then summarized into five themes. These themes included:

Theme 1: Adequacy of space and learning resources in the lecture rooms

Theme 2: Adequacy of space and learning resources in the Skills Lab

Theme 3: Adequacy of computers in the computer labs

Theme 4: Adequacy of the library for current text books and

Periodicals

Theme 5: Time Management by lecturers back of the lecture theatres.

In both Universities none of the students had ever seen a SMART Board and they all expressed interest in having them installed in their Schools so that they could keep pace with the developing world's academic trend.

Adequacy of Space and Learning Resources in the Skills Lab

In University A- SON the students said that the Skills Laboratory space was only enough when they were divided into groups. SOM students said that they had 3 skills labs and space would only be enough when they were also divided into groups. The SOM students also said that they had only one bed and one dummy for demonstrations.

In University B - SOM students stated that they didn't really have a skills lab in their school but shared a skills lab with the School of Nursing. They added that equipment for demonstrations was not enough due to large numbers of students e.g. there were only 6 BP machines for about 30 students.

Adequacy of Computers in the Computer Labs

Discussion of the Findings

Adequacy of Space and Learning Resources in the Lecture Rooms

Students from University A in both School of Nursing (SON) and school of Medicine (SOM) said that they had no problem of space in their lecture rooms. Students in University B in both School of Nursing and School of Medicine said that they had large halls with very many students and microphones were needed so that students sitting at the back could hear what the lecturers were teaching. However, it was noted with concern from students' discussions that in the Medical school of University B there were classes of over 300 students taught in one lecture hall. University B medical students stated that they had challenges during ward rounds because they were usually too many students in a ward cubical excluding the doctors.

Regarding adequacy of teaching resources, students from University A – SON stated that they had LCD Projectors but they needed diagram charts in their lecture rooms. University A– SOM students stated that they had LCD projectors and white boards but white board markers were not always available. They felt that they needed permanently fixed projectors in the lecture rooms and also more sockets for their laptops.

In University B - SON students indicated that they needed screens for projecting learning content instead of using walls as screens. They also stated that they needed curtains for the windows to darken the rooms when a lecturer is using the overhead projector. Students from University B – SOM also said that their teaching resources were enough but some of their screens had old permanent marks on them and that interfered with visibility of the teaching content on the screen. They complained that microphones occasionally had low batteries and would therefore be occasionally non-functional. This inconvenienced the students who sat at the

University A - SON students stated that computers were not enough in the library. They felt that the computer lab should be expanded and more computers purchased for the students. The SOM students said that there were only 15 computers and they were not enough for all the students and therefore students had to use their own laptops.

In University B – SON students were quite disappointed by the fact that there were less than 50 computers for the entire College of Health Sciences. Most students had to use their own laptops. The SOM students of University B also had a similar view that computers were not enough. They stated that only about 15 computers were in good working condition and therefore most students had to use their own laptops.

Adequacy of the Library for Current Text Books, Journals and Periodicals

In University A both the SON and SOM students exclaimed that most text books were too old and therefore they needed newer versions to be purchased. The SOM students

felt that the reading space in the library was also too small for the person, laptop, text books and note book.

In University B both the SON and SOM students were happy with their well-equipped library. They said that their library even had Wi-Fi and the library staff always assisted them to access online electronic resources. They also stated that students in the College of Health Sciences were allowed to request for the most current books to be purchased for library use. However, they stated that they needed more sockets in the library for charging their laptops.

Time Management by Lecturers

The University A –SON students said that some lecturers do not complete their teaching content because of attending Seminars and Conferences. The SOM students of this Mary Njeru *et al.*: Perceptions of the Adequacy of Learning Resources by Undergraduate Medical and Nursing Students in Two Kenyan Public Universities

University said that some lecturers miss classes and then make up later. They also stated that some lecturers came late and left early therefore giving them a 'raw deal'. 'Some go out f the country for even 2 months while students are in session'. Surgeons were reported to be very late for lectures at times.

In University B - both the SON and SOM students said that their lecturers missed some classes but they always tried to make up for the missed classes. They complained that some make-up classes were slotted in during lunch time and therefore inconveniencing them because that was their own time.

The SOM students also complained that some lecturers could be late even for one full hour, possibly because of traffic jam. They also stated that a lecturer may promise to come for class but may end up not turning up at all. However, they said, some departments had very punctual lecturers.

Conclusion

Learning resources in the two Universities were found to be inadequate. Classroom space in University B was inadequate due to high numbers of student intakes. Also in University B Medical students lacked a skills lab of their own. In University A there were old library text books and periodicals. There was also need to update equipment in the skills laboratories of the two schools of both Universities. In Both Universities A and B there were inadequate numbers of computers in the libraries for use by students. This inadequacy was attributed to admission of high number of students in University B and inadequate financial resources in both Universities A and B. It was also noted that Medical students in University B received less attention in provision of learning resources than Nursing students in the same University.

Recommendations

1. Establish a skills laboratory for Medical students urgently in University B to avoid sharing the with the school of Nursing. Their academic needs are different from those of nursing students. Purchase more manikins for Medical students in the same University.

2. There is need to stock the University A library with new text books and do away with old ones.

3. There is need for better planning for diagnostic lab classes in order to reduce congestion in University A.

4. In both Universities A and B in the colleges of Health Sciences, there is need to expand the computer labs and purchase new computers for students.

5. Numbers of Medical students should be reduced during intakes. This will reduce the need for many microphones and also congestion during ward rounds.

6. Spare batteries should be bought for the microphones for use in large lecture theatres. It is important to buy enough batteries for microphones that can last through all Trimesters in a year.
7. Time management by lecturers in both Universities should be improved to reduce inconveniencing the students.

8. It is also recommended that both Universities write proposals to seek grants and collaborate with organizations that donate text books.

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APPENDIX XVII: PLAGIARISM REPORT

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PERCEPTIONS OF LECTURERS AND UNDERGRADUATE MEDICAL (MBChB) AND NURSING (BScN) STUDENTS REGARDING THE ADEQUACY OF TEACHING AND LEARNING RESOURCES IN TWO KENYAN PUBLIC UNIVERSITIES BY MARY NJERU