

**COMPETENCY PERCEPTION OF MEDICAL EDUCATORS IN
INNOVATIVE MEDICAL CURRICULUM PLANNING AND
DEVELOPMENT AT MOI UNIVERSITY, COLLEGE OF
HEALTH SCIENCES.**

BY

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DECLARATION

Declaration

This thesis is my original work and has not been presented for the award of any degree in any other university.

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DEDICATION

This research project is dedicated to all members of my family. It is also dedicated to my late parents, who initially provided me with an opportunity to go to school.

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ABSTRACT

The background to this study concerns innovations in medical education curricula and changing health care needs that require constant changes in medical school curricula. Innovative medical curricula provide an opportunity to study perceived competence of educators in innovative medical curriculum planning and development. Competency of educators could be related to innovative medical curriculum planning and development as a making process. The objective of the study was to investigate and determine the competency perception of medical educators in innovative medical curriculum planning and development. The study was a cross-sectional, quantitative and descriptive survey design, conducted at Moi University, College of Health Sciences. The SPICES model on innovative medical curriculum, (Harden, 1984) was the theoretical framework that guided the innovative study. Harden's ten questions to ask when planning an innovative medical curriculum (Harden, 1986) was the conceptual framework that guided the research process.

The methodology involved all educators in the College of Health Sciences and a pre-tested questionnaire was used to collect data from participants. Quantitative data were collected and analysis was done via SPSS Version 16 for windows. Presentation of data was done using frequency tables. In addressing the research question, respondents were asked to state "What effect does educator's perceived lack of competence in curriculum planning and development have on an innovative medical curriculum making process". The study Measured competency perception of educators on innovative medical curriculum planning and development as a process.

In the Results, a total of 139 educators participated with 92 (66%) returned, 11 (12%) incomplete and 81 (58%) valid were analysed. Major findings indicate that, while a higher proportion (60.0%) of educators depicts some competence on innovative medical curriculum planning and development, significant proportion (40.0%) exhibit incompetence in developing and implementing PBL, developing curriculum resources and assessment instruments. Significant proportions (30%) were not well equipped in identifying and aligning essential competency domains, management of informatics, critical thinking and research.

It was concluded that there is a significant relationship between lack of educator's competence in curriculum development and innovative medical curriculum planning and development making process. 87.6% of medical educators strongly perceived that lack of educator's competence on curriculum development has effect on innovative medical curriculum making process

Recommendations are that, regular trainings, seminars and conferences on innovative medical curricula issues are recommended for educators. Prospective studies be done to determine relationships between incompetence in innovative medical curriculum planning and development and teaching and learning.

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LIST OF ABBREVIATIONS AND ACRONYMS

AACME	American Academy of Continuing Medical Education
ACGME	Accreditation Council for Graduate Medical Education
BVM	Bachelor of Veterinary Medicine
GMC	General Medical Council
GMER	Global Minimum Essential Requirements
LCME	Liaison Committee on Medical Education
IIME	Institute for International Medical Education
NHS	National Health Service
PBL	Problem-Based Learning
SPICES	Student Centred, Problem Based, Integrated, Community Based, Elective, Systematic
SPSS	Statistical Package for Social Sciences
UK	United Kingdom
USA	United States of America
WHO	World Health Organization
WFME	World Federation for Medical Education

DEFINITION OF TERMS

Assessment: Is determining achievement of intended learning outcomes.

Curriculum Development: Describes the *process* of curriculum-making.

Curriculum design: Describes the end result of curriculum development.

Curriculum Dynamics: Process of promoting response to innovative curriculum changes.

Competence: The overall outcome of a training program consisting of a cluster of related abilities, commitments, knowledge, and skills that enable a person to act effectively in a job situation.

Competency-based education: Training based on identified competencies.

Competency-based curriculum: A set of educational experiences designed to support mastery of core knowledge, skills attitudes and attributes required of professionals.

Curriculum: All managed educational activities taking place in a programme.

Dynamic Curriculum: ‘Curriculum characterised by continuous changes.

Innovative medical curriculum: Innovations based on new methods of training and technologies for learning that integrate basic science with clinical medicine.

Educators: Professionals providing medical education.

Faculty: Teaching staff of a university or college, or of one of its departments or divisions, viewed as a body.

Perception: The way educators perceive, think, view and understand innovative medical curriculum development.

Professional competence: An aptitude to carry out a task or job position effectively.

Pseudonyms: False names or codes assumed by respondents to conceal their identity.

CHAPTER ONE;

INTRODUCTION

1.1 Background to the Study

There is a very strong long standing belief, by Cooke *et al.*, (2006), that Medical Education curricula seems to be in a perpetual state of unrest. From the early 1900s, more than a score of reports from foundations, educational bodies, professional task forces and research findings have criticized medical education for emphasizing scientific knowledge over biological understanding, clinical reasoning, practical skills and the development of character, compassion and integrity, Flexner (1910), General Medical Council (2003) and Watson (2003).

In response to these criticisms, several of the task forces, including the Accreditation Council for Graduate Medical Education (ACGME, 2006) and the American Academy of Continuing Medical Education (AACME, 2006) have called for curricular changes, reforms and revolution with a view to enhancing the ability of educators, physicians, students and other health care professionals to fulfil their societal contracts of providing quality medical care.

However, AACME had observed that most institutions in their responses only aim at improving teaching skills of their faculty members with no attention to curriculum making process. Few of these publications describe faculty training in curriculum development while those which do so, focus partially on curriculum development excluding educator's involvement or participation.

Following these trends, health systems and training institutions are now undergoing reforms, driven principally by the increasing demands and finite budgets for improved health care delivery through innovative medical curriculum developments as had been concluded by Rosenbaum *et al*, (2005). Therefore, GMC (2003) had argued that, if the ultimate purpose of medical education, that is, to meet the health needs of the society is to be achieved, the primary goal of undergraduate medical education should be to develop an innovative and competency-based medical curriculum that produce students who are broadly skilled in the core competencies that transcend all disciplines of medicine. The purpose according to GMC was to provide a mechanism for quality improvement in medical education, in a global context, to be applied by institutions responsible for medical education. However, the challenge according to Watson (2003), was the competency of medical educators, who are the implementers and drivers of all forms of medical curricula.

These are issues related to educator's response to global changes. These changes include involvement in curriculum development, motivation, competence, willingness and ability to participate in an innovative curriculum making process. In view of the above arguments by various scholars and researchers, (Gwee, 2009) observed that, developmentally innovative and progressive competency-based medical curriculum was highly considered to serve this purpose. These authors made the conclusion that the central mission of medical education was to improve the quality of health care delivered by doctors and other health professionals and they must never fail to remember the central role played by curriculum and its developers, educators, students and patients as the ultimate recipients of these skills. What doctors, educators, students, curriculum planners, curriculum developers and other health

providers do, how and when they do it, depends on the quality of medical education in respect to the curriculum being implemented and the competency of educators implementing and reviewing these programmes. Braddock *et al*, (2004) had also shared the sentiment that, everyone in medical education is aware of the legacy of Abraham Flexner, whose critical analysis of medical education after the turn of the 20th century led to a medical curriculum revolution and how physicians were to be taught in the 21st century and beyond, (Flexner,1910).

These trends could be construed to mean that a new revolution was occurring in medical education curricula and concerns our increasing recognition that we need more effective methods to teach student-centred learning. To enhance these cultural competencies, and to foster professionalism, innovative medical curriculum ought to be developed and implemented, Braddock *et al*, (2004). Curriculum studies reviewed in context of this study revealed diverse challenges, trends and innovative reforms dictated by changing health needs within societies and accompanied by curriculum management and delivery systems involving students, educators, courses and classes.

The emergence of innovative and competency-based medical education provided an answer to some of these controversies as outlined by Cook, *et al*. (2006), and wide and a rich field where diverse curriculum studies could be undertaken. Louie *et al*, (2004) had also concluded that medicine has wedded innovative and competency-based training for better or for worse. Organized medical curricula had to define the various functions of educators, physicians and their associated competencies in terms of curriculum development.

Following the publication of *Tomorrow's Doctor*, GMC (2003) and the recommendation that undergraduate medical education must take into account modern educational theory and the increasing emphasis on professionalism; there has been growing interest in innovative and competency-based medical curriculum planning and development.

The process of globalization by IIME (2006), increasingly evident in medical education makes the task of defining the global essential competencies required by the 'global physicians' an urgent matter. This issue was taken up by the Institute for International Medical Education (IIME, 2006) which developed the concept of 'Global Minimum Essential Requirements' (GMER) and defined a set of 60 learning objectives as global minimum learning outcomes that students in medical schools must demonstrate at graduation. Beside these 'global competencies', medical schools should add national and local requirements of which these scenarios scale up to issues on innovative competency-based medical curriculum development.

Judging from the above literature, chronology of events, arguments and references, it implies that medical educators play a crucial role in curriculum development process as had been observed by Rosenbaum (2005). By implication, educators' competence in innovative medical curriculum planning, development, implementation and evaluation becomes an important area of study at Moi University. This is because the institution follows an innovative problem-based learning strategy (PBL), a continuum of the SPICES model in a competency-based medical curriculum.

It can therefore be concluded to mean that medical education is entering a phase of renewed change driven by developments in information availability, technology and the changing health needs of a rapidly growing and developing society, and over the past century, medical education has evolved to meet these demands. A study by Cohen (2009) also confirmed that in this new century, medical students and their teachers are confronting developments that their predecessors never imagined. Gwee (2009), concurred with these sentiments and stated that these issues range from managed care and a multicultural society, to palm top computers and medical informatics, the genetic code and harsh realities of public health that include domestic violence, effects of homelessness and AIDS, to learning new ways to enhance health care quality, while minimizing medical mistakes.

1.2 Problem Statement

Increasing demands for innovative curricula, in a study by Shumway (2008) found that most academic medical institutions have few faculty educators adequately knowledgeable in innovative curriculum planning and development. To compound this problem, Moi University advocates and administers innovative medical curriculum in terms of Problem-based learning (PBL), in a continuum of the SPICES Model, developed by Harden, (1984).

This is supported by IIME (1999), who had stated that, modern technology has allowed medical innovations to take place more rapidly than ever before, often fundamentally altering the field.

To cope with these changes, medical institutions around the world have been increasingly confronted with the challenge of making their curricula more meaningful and relevant to the needs of the time in order to produce doctors and other health professionals oriented to the real needs of the community, (Moores, 2009) and (Elkind, 2009).

Since Moi University advocates and implements an innovative or similar medical curriculum in terms of problem-based learning (PBL), it is only logical to believe that its educators ought to be highly competent in the process of planning, developing, implementing and evaluating an innovative medical curriculum. However, literature search revealed no information on educator's competency perceptions, views on curriculum dynamics and participation in the process of innovative medical curriculum planning and development that include problem-based learning (PBL) being followed at Moi University.

It is because of the above facts that this study has been deemed essential that, there is need to determine their competency perception in innovative medical curriculum planning and development as a process.

It is against this background in medical educational reforms, challenges and changing health needs that a study on competency of educators in innovative medical curriculum is being conducted at Moi University, College of Health Sciences so as to address this gap.

1.3 Study Justification

Professionals in training have to master both abundant theory and large bodies of knowledge; the final test of their efforts, however, will be not only what they know but also what they do in terms of professional competence (Sullivan, 2005). This means that, the objective of innovative medical curricular reforms is to transmit knowledge, impart skills and inculcate the values of the profession in an appropriately balanced, more effective and integrated format. Several events in recent years have emphasized the importance of developing and implementing innovative clinical curricula in bioterrorism and emerging infections as a response.

On September 11, 2001, the United States faced the most serious terrorist attack in its history (Henderson, 2002). Later that year, bioterrorism resulted in 22 cases of anthrax, five of whom died. In 1999, 59 patients were hospitalized in New York City with West Nile Virus, an infection previously undiagnosed in the United States and seven of those patients died. West Nile Virus has subsequently spread throughout the United States, causing significant morbidity and mortality (Henderson, 2002).

In 2003, a previously unknown viral illness was identified in South East Asia. This new disease, Severe Acute Respiratory Syndrome (SARS), resulted in more than 8,000 cases worldwide, with at least 774 deaths. Since we live in an era where rapid worldwide travel is common, physicians today are likely to encounter a victim of an emerging infectious disease.

Kenyan medical professionals are faced with issues such as HIV/AIDS, terrorist attacks, grenade attacks, and air, sea, fire and road accidents. They are also under pressure to respond to medical conditions arising from situations such as refugees and internally displaced persons (IDP) Camps, or threats of infectious outbreaks such as Ebola. This suggest that medical education requires a frequently constant innovative medical curriculum planning and development, evaluation and change and a dynamic ongoing curricula in order to incorporate new knowledge and competencies so as to respond to these changing health needs. Therefore, this study is in line with the vision of being the University of Choice in nurturing innovation and talent in science, technology and development, mission and core values.

1.4 Significance of the Study

On academic literature the findings of the study will theoretically contribute immensely into an already existing and vast body of knowledge on innovative medical curriculum development studies. Findings will also be used by other researchers in the field of medical training, innovative medical curriculum planning and development, implementation and evaluation.

Practically, the institution and educators will use the findings of the study in making decisions regarding the role of the faculty and its educators on innovative curriculum issues and to develop an elaborate criterion by which the principles of innovative curriculum reform can be judged and improved. Consequently, the educators will use the findings of the study to reassess their stand, believes, views, perspectives, competence and skills on innovative medical curriculum development process.

It is hoped that this study will have significant influence on medical school curriculum development and educational processes, paving the road to the state of affairs in innovative oriented medical education with the possibility of enhancing farther research in the field. Curriculum developers will also use the findings of the study in planning, designing, developing, evaluating and making changes in innovative medical curricula while the learners will use the findings of the study to guide their learning.

1.5 Objectives of the Study

1.5.1 General Objective

The general objective of the study was to determine the competency perception of educators in innovative medical curriculum planning and development as a process.

1.5.2 Specific Objectives

To respond to the general objective the researcher had three (3) specific objectives which were;

- (1) To determine educators' competency perception in knowledge and understanding of innovative medical curriculum planning and development as a process.
- (2) To solicit educators' views and perceptions on innovative medical curriculum dynamics.
- (3) To investigate and determine the role and involvement of faculty/educators and perceived impact in innovative medical curriculum planning and development making process.

1.6 Principal Research Question

What effect does educator's perceived lack of competence in curriculum planning and development have on an innovative medical curriculum making process?

1.6.1 Specific Research Questions.

The study had three (3) specific research questions as follows;

- (1) What extent do educators perceive they possess competence, knowledge and understanding in innovative medical curriculum planning and development?
- (2) What are educator's views and perceptions regarding innovative medical curriculum dynamics and reforms in the twenty first century?
- (3) What role do educators and faculty perceive they play in innovative medical curriculum planning and development making process?

1.7 Limitations and Delimitations

The study was limited to;

- Time bound constraints
- Budget constraints.
- Census being less than 200 could degrade the quality of the study

1.8 Assumptions of the Study

It was assumed that:

- (1) The respondents provided genuine and truthful responses;
- (2) The instrument generated the desired constructs

CHAPTER TWO

LITERATURE REVIEW

2.1 Overview

This chapter reviewed literature found to be relevant and pertinent to the study, in particular, issues relating to innovative curriculum, competence, planning and development. These included the process of designing, developing, implementing and evaluating an innovative medical curriculum. The chapter gave particular reference to College of Health Sciences, Moi University in Kenya and examined the competency of educators in innovative medical curriculum planning and development as a process.

2.2 Meaning of Curriculum

The term curriculum is a Latin word meaning “the course of a chariot race” and traditionally curriculum included two elements: content and examination. According to Harden (2001), curriculum in a narrow view includes content and examination while in a wider context; curriculum includes aims, learning methods and subject matter sequencing. The broader concept of curriculum describes it as a sophisticated blend of educational strategies, course content, learning outcomes, educational experiences, assessment, the educational climate or environment and the individual students’ learning styles, personal timetable and the programme of work.

Curriculum does not only covers the formal teaching or learning strategies but also the other aspects of human development associated with institutional life, which can transform students into a productive citizens.

In the time of information explosion, the curriculum planners must not only decide what should be taught but also what can be eliminated from the curriculum, hence the need to define minimum essential knowledge and skills, including core knowledge and skills.

Burton & McDonald (2001) also stated that, it is difficult to provide a simple dictionary definition for this term "Curriculum" because of its complex nature. Simply it can be considered as the list of topics taught in the school or in an institution. In a wider view it encompasses all the experiences that the student undergoes through while being part of that institution. According to Burton & McDonald (2001), the idea of a curriculum is hardly new, but the way it has been understood and theorized has altered over the years and there remains considerable dispute as to its meaning. A curriculum has its origins in the running chariot/tracks of Greece, which was literally a race course, Burton & McDonald (2001).

A useful starting point for curriculum "meaning" might be the definition offered by Kelly (1999), which means all the learning which is planned and guided by the school, whether it is carried out in groups or individuals, inside or outside the school. Historically, he stated that curriculum as an idea has its roots in the Latin word for race course, explaining the curriculum as the course of deeds and experiences through which children become the adults they should be for success in adult society. According to Kelly (1999), a curriculum is a social engineering arena and with cultural presumptions and social definitions, a curriculum formulation has two notable features.

One, that scientific experts would best be qualified to and justified in designing curricula based upon their expert knowledge of what qualities are desirable in adult members of the society, and which experiences would generate the said qualities. Two, curriculum when defined should provide deed-experiences the student ought to have to become the adult he or she ought to become.

Crucial to the curriculum is the definition of course objectives that usually are expressed as learning outcomes and normally include the programme content to be taught, teaching strategies, learning resources and assessment strategy navigated by communications, numeric, information technology and social skills units, modelled into core curriculum. In medical education, core is a curriculum course of study that is deemed central and usually made mandatory for all students of a school or school system, (Kelly, 1999).

According to Prideaux (2003), curriculum represents the expression of educational ideas in practice and includes all the planned learning experiences of a school or educational institution, which should be open to critique and should be readily transformed into practice. According to Gwee (2009), a curriculum is a product of planning and execution and is a dynamic entity with an existence which goes beyond the concept of listing or description of its formal components. Therefore, a curriculum is what is taught and what is learned within an academic framework but the potential for learning extends well beyond the boundaries of that framework in medicine, an argument indicated in the hidden curriculum.

2.3 Process of Curriculum Planning and Development

Curriculum development in medical education, according to Prideaux (2003), is a scholarly process that integrates content area with educational theory and methodology and evaluates its impact. When curriculum development follows a systematic approach, it easily fulfills criteria for scholarship and provides high-quality evidence of the impact of faculty member's educational efforts.

Generalist faculties, because of their unique roles in both the delivery of health care and educational missions in academic medical centres are often recruited into medical education reform efforts and curriculum development. Faculties are usually content experts, but may not be familiar with medical education organizations and educational resources for this work as per the author. While many resources are available online and are applicable to various aspects of curriculum development, internet resources have not previously been categorized for this purpose in the literature, (Prideaux, 2003).

2.3.1 A Systematic Ten Step Approach

Harden (1986), had argued that curriculum development and change are important processes in educational institutions. Accordingly, if these processes are well planned and implemented, learning and teaching becomes, meaningful and relevant.

Likewise, if they are not well planned and implemented, the result is, ineffective teaching and learning. Harden suggested ten meaningful questions to ask when planning an innovative medical curriculum.

These were listed in the conceptual framework as needs, outcomes, content, educational, teaching and assessment strategies, curriculum communication, educational climate and curriculum management.

Harden *et al.* (1997) indicated that a curriculum should be viewed not simply as an aggregate of separate subjects, but rather as a programme of study where the whole is greater than the sum of the parts. These suggest that a curriculum is the result of bringing together a number of elements: content, strategies and methods to ensure quality in education and excellence in performance, but should have a right mix of elements to ensure efficiency and to facilitate learning.

Harden (2001) also elaborated on the concept that “a curriculum is a sophisticated blend of educational strategies, course content, learning outcomes, educational experiences, assessment, the educational environment and the individual students’ learning style, personal timetable and a programme of work”.

Mutema *et al* (1992) proposed a similar ten-step approach to curriculum planning and development. These ranged from identification of needs/problems, task analysis, educational objectives, development of content, teaching methods instructional materials, evaluation, implementation and curriculum change.

Therefore, the process of curriculum development is essential for successful achievement of educational goals for medical students. It asks for a systematic approach which should respect several aspects: the needs of patients, of the society, the students and educators.

When it is innovative and competency-based, for example, the process itself should be done in a specific algorithm. This starts from the definition of final goals of the educational process, through the selection of the tools for achieving these goals, and integration of different elements inside one curriculum. Curriculum should, therefore, present different and diverse course contents, learning and teaching strategies, integrated into one picture specific for a certain institution. It has to respect all existing material and human resources of the institution.

2.3.2 A Systematic Six Step Curriculum Development Approach

Kern *et al*, (1998) and colleagues proposed and outlined a six steps curriculum development plan, emphasizing the constant interplay among the steps as follows:

(a) Problem Identification and General Needs Assessment;

According to Patricia *et al*, (2004), in support of Kern, she argued that, identification and critical analysis of the health care problem that will be addressed by the curriculum requires substantial research to analyze what is currently being done by practitioners and educators, These include the *current approach*, and ideally what should be done by practitioners and educators to address the health care problem, as the *ideal approach*. The general needs assessment is usually stated as the knowledge, attitudes, and performance deficits that the curriculum will address.

(b) Needs Assessment of Targeted Learners;

The general needs assessment is applied to targeted learners. What kind of a doctor we want to educate depends mostly on social needs but it can reflect job opportunities, financial rewards and attitudes acquired during the process of studying.

(c) Goals and Objectives;

Overall goals and aims for the curriculum should be written clearly. Specific measurable knowledge, skill or performance, attitude, and course objectives are written for the curriculum.

(d) Educational Strategies;

In his SPICES model, Harden (1984), stressed that it was necessary to make a plan to maximize the impact of the curriculum, including content and educational strategies congruent with the objectives. This concerns content organization, educational strategies and the way elements of curriculum should be communicated. The kind of educational environment or climate that should be fostered. Content which is included must provide student with critical thinking. It must be selected and organized in a way to initiate critical approach to facts and develop the skill of information retrieval.

(e) Implementation;

A plan for implementation, including timeliness and resources required, is created and plan for faculty development is drawn to ensure consistent implementation. Therefore, implementation is an interaction between those who have created the programme and those who are charged to deliver it.

According to Ornstein and Hunkins, (1998), implementation requires educators to shift from the current programme which they are familiar with to the new or modified programme. Implementation involves changes in the knowledge, actions and attitudes of the people concerned. It can be seen as a process of professional development and growth involving ongoing interactions, feedback and assistance.

It is a process of clarification whereby individuals and groups come to understand and practice a change in attitudes and behaviours; often involving using new resources. It involves change which requires effort and will produce a certain amount of anxiety and to minimize these, it is useful to organise implementation into manageable events and to set achievable goals. It requires a supportive atmosphere in which there is trust and open communication between administrators and educators, and where risk-taking is encouraged.

Implementing a curriculum is the most crucial and sometimes the most difficult phase of the curriculum development process. Those responsible for implementing a curriculum often hear comments and concerns such as, lecturers are already overloaded – how are they going to implement the new ideas. Parents and deans are only interested in a high pass rate in assessments – how are faculties to incorporate suggested changes.

These are real concerns and made worse when persons implementing the curriculum are not clear what is expected of them. How often have we heard people say, ‘the plan was good but implementation was poor’? On the other hand, if a curriculum plan is not implemented and remains on the shelf then all efforts in planning will be a sheer waste.

(f) Evaluation and Feedback;

According to Mutema *et al* (1992), the purpose of curriculum evaluation in health professions is to determine the merit, quality, effectiveness, worth, impact, relevance, monitoring for improvement and usability of the programme.

This helps in the process of identification of problems inside curriculum and institution, solving of problems, re-designing of certain aspects of curriculum and quality assurance. Curriculum evaluation can be made through evaluating many different aspects. These include psychological and interpersonal skills, continuing learning, professional satisfaction, practice behaviour, educational achievement and cognitive development, institutional issues, student passing rates, making of clinical mistakes, clinical problem solving and educational cost per student.

It is very important to carefully define the appropriate time for an evaluation for each of these areas as well as the methods for its measurement. Evaluation will only have full meaning if it is followed by action in order to improve areas which are estimated as weak points of the curriculum.

2.4 What is Innovative Medical Curriculum?

Despite vast advances in biomedical research and technology, most medical school curricular have remained mostly static for the past half century, (Jallow, 2011).

However, a selected group of medical schools have begun to implement innovative curricular based on new methods of physician training and technologies for learning that integrate basic science with clinical medicine such as Patient-Based Learning, Organ Modules, Computer Simulation of Procedures, and E-Learning.

2.4.1 Characteristics of an innovative medical curriculum

According to Shumway (2008), innovative and competency-based medical curriculum should have the following characteristics: (1) Learning outcomes/competencies on performance based are identified and communicated to all, (2) May be adapted to suit

local context and needs. (3) Emphasizes personal development of health care provider as a professional. (4) Where the accomplishment of competence is able to be assessed. (5) Where a criterion-referenced system of student assessment is the norm. (6) Is applicable to all phases of the continuum of professional education.

2.4.2 Education for Capability

In most medical schools, existing medical training provides a general education in a variety of subjects relevant to a doctor's need and this broad base has made a significant contribution to the problem of information overload (GMC, 2003). Education for capability is a move to strike a balance between general education and vocational training to bring relevance in education in order to reduce information overload in curriculum. To overcome the problem of factual or information overload, a new strategy, "core with options", was advocated by Harden & Davis (1995). Core curriculum is developed by delineating basic knowledge, skills and attitudes, which must be studied before a newly qualified doctor can assume the responsibilities of a pre-registration house officer.

Options provide areas to the students for study depending on individual needs or interests while mastery of core ensures the maintenance of standards. Options also provide in-depth work and achievement of high-level competencies, such as critical thinking. In addition to clinical competencies, students must develop generic competencies or transferable personal skills essential to their roles as health professionals. These include bio-ethics and communication skills, interpersonal skills, problem-solving ability, decision-making capability, management and organization skills, working in teams, information technology skills and doctor-patient relationship.

2.4.3 Problem Based Learning (PBL)

According to Koh *et al*, (2008), PBL is an effective and innovative way of delivering medical education in a coherent, integrated programme and offers several advantages over traditional teaching methods. It is based on principles of adult learning theory, including motivating the students, encouraging them to set their own learning goals, and giving them a role in decisions that affect their own learning. Students from PBL curriculum as per their arguments, seem to have better knowledge retention, generate a more stimulating and challenging educational environment and the beneficial effects from the generic attributes acquired through PBL should not be underestimated.

PBL enables students to develop the ability to translate knowledge into practice at an early stage, encourages individual participation in learning and also allows the development of teamwork skills. Students in PBL courses have been found to place more emphasis on "meaning" (understanding) than "reproduction" (memorization). Students must engage in a significant amount of self-directed learning where lectures are kept to a minimum. PBL originated from McMaster University in Canada, and then at Maastricht University, and is now widely adopted in medical schools in many countries. It does require a heavy investment in resources (library books, IT, tutorial rooms) as well as requiring education and training for tutors, (Wojtczak, 2000). Problem Based Learning (PBL) strategy should possess the following characteristics; Learning is driven by challenging, open-ended, ill-defined and ill-structured problems. Students generally work in collaborative groups and teachers take on the role as "facilitators" of learning. In PBL, students are encouraged to take responsibility for their group and organize and direct the learning process with support from a tutor or instructor.

Advocates of PBL claim that it can be used to enhance content knowledge and foster the development of communication, problem-solving, and self-directed learning skill. Therefore, PBL position students in simulated real world working and professional contexts which involve policy, process, and ethical problems that will need to be understood and resolved to some outcome.

2.5 Curriculum and the Need for Change

The need for curriculum change had arisen from a study by Abrahamson (1978), one of the experts of medical education. The argument stated that, a curriculum that does not change; a curriculum that is unchanging in response to developing needs of the society is a curriculum in trouble. That a curriculum ought to be healthy, alive and well, vibrant and possess the ability to respond to the ever changing health needs of the society being served.

Pinto (2008), in bargaining for curriculum change had stated that, today's society is presenting current health care providers with greater and more diversified challenges. Indeed, the increase in average life expectancy, the subsequent growth within the oldest age group, the economic, social and demographic changes, the progressive urbanization of populations and their increasing awareness of their health rights, just to mention a few, require these professionals to be skilled workers in different fields with a variety of problems.

On the other hand, the emergence of new health problems related to environmental issues and the boom of new, social pathologies, has given rise to a growing need for

the articulation of several levels and models of health care provision. This implies that professionals working in the sector should be able to provide a variety of long-term solutions to the problem and also be in possession of a profound knowledge of the health system and its potentialities. Standa *et al* (2000) on investigating root causes of student disturbances, riots in Kenyan Public Universities, established that inadequate curriculum resources and unfavourable educational climate are some of the major factors, justifying curricula in trouble and hence, the need for reforms.

2.6. Viewpoints on Curriculum Product and Reforms

According to Roberts (2004), curriculum reforms must extend to the hidden curriculum and to be effective, it should begin with a redefinition of the selection criteria for entry to the medical undergraduate course of a more socially representative intake before the taught curriculum commences. Accordingly, western undergraduate medical teaching developed as a university-based apprenticeship model and unchanged for decades, was consolidated at the beginning of the last century with two important reforms: First, an academic split within the curriculum with the concept of separate pre-clinical sciences, and a curriculum preceding clinical teaching was introduced. Secondly, the long-serving apprenticeship model with the concept of bedside teaching led by senior clinician, where trainees learned by direct observation of the expert was underpinned.

Beyond this, there was very little change in the medical curriculum for nearly 60 years until recently when suggestions for radical reforms arose, (Roberts, 2004).

In response to these scenarios, (Centres for Disease Control and Prevention, CDC 2007), the Association of Teachers of Preventive Medicine through a cooperative agreement and the Columbia University School of Nursing's Centre for Health Policy, among others, developed a competency model to provide a foundation from which to build locally relevant training, (Columbia University, 2002). This resulted in the work, entitled *Bioterrorism and Emergency Readiness: Core Competencies for All Public Health Workers* that included important domains of competencies.

Studies by Calhoun *et al*, (2004) observed that all of the organizations which have engaged in competency specification and modelling for their members have subsequently had to address the many challenges and barriers to the dissemination and integration of their models into specific innovative competency based educational and professional development practices. However, innovative competency-based education and training has long been avoided by educators for a number of reasons, including fear of change, lack of understanding of innovative and competency-based pedagogical practices, teaching methodologies, confusing terminology, development costs, time constraints, inadequate consensus building, and assessment techniques.

Therefore, pressure is mounting on curriculum planners to adopt a product-orientated approach in order to achieve competency in a range of knowledge and practical skills that are easily measured by assessment according to GMC, (2003). GMC, however argued that medical curriculum should provide a broad, general education in clinical and basic sciences with the acquisition of lifelong-learning skills and the generic model of learning recommended in the undergraduate medical education that should promote the following aims;

- To provide specific skills and knowledge needed to be a doctor.
- To understand research,
- To respond to the needs of the society.
- To develop competency in critical thinking and problem solving.

These reports outlined the major influences for change and defined the desirable attributes of the modern day doctor that should provide the basis for the aims of a new generation of medical curricula as;

- Care for the health of the community
- Emphasize primary health care
- Participate in coordinated care
- Ensure cost of effective care
- Practice prevention
- Involve patients and families in decision making process
- Promote healthy life style
- Assess the use of technology
- Manage information
- Provide counselling on ethical issues
- Manage accountability
- Participate in a culturally diverse society
- Continue to learn

In essence, these seminal reports propose a reform of medical education, suggesting a shift towards a more community-oriented, holistic and caring practitioner.

At the same time, fresh health challenges loom, according to Frenk *et al* (2010) that, new infectious, environmental, and behavioral risks, at a time of rapid demographic and epidemiological transitions, threaten health security of all. Health systems worldwide are struggling to keep pace, as they become more complex and costly, placing additional demands on health workers. While new challenges have resulted in an increased sense of urgency to improve the knowledge base and response capability of physicians, few medical schools and residency programme have new and innovative curricula in place to teach these concepts.

2.6.1 Concept and the Idea of Competency

A generally accepted concept of competency establishes it as an effective ability to successfully carry out some activity which is totally identified. Competence is not a probability of success in the execution of one's job but it is a real and demonstrated capability. Accreditation Council for Graduate Medical Education (ACGME, 2001) defined the concept of "Professional Competence" as the aptitude to carry out a task or job position effectively, on account of possessing the qualifications required for such. These proposed definitions of a professional competence are occupations whose core elements are work based upon the mastery of a complex body of knowledge and skills.

Regarding objective of this study, competency perception of educators in medical curriculum planning reflex the ability to demonstrate the capability and aptitudes in innovative medical curriculum development as a process.

It is a vocation in which knowledge of some department of science or learning or the practice of an art founded upon it, is used in the service of others. Its members are governed by codes of ethics and professional commitment to competence, integrity and morality, altruism, and the promotion of the public good within their domain. Building on prior definitions, Shumway (2008) indicated that professional competence is the habitual and judicious use of communication, knowledge, technical skills, clinical reasoning, emotions, values, and reflection in daily practice for the benefit of the individual and community being served.

Competence builds on a foundation of basic clinical skills, scientific knowledge, and moral development. It includes a cognitive function that is acquiring and using knowledge to solve real-life problems; an integrative function, meaning using biomedical and psychosocial data in clinical reasoning. Shumway (2008) had stated that competency is possibly the most prevalent buzzword in medical education today. To read a journal article or an official document in medical education is to be washed over by waves of general competencies, core competencies, cultural competency, communication-skills competency, competency assessment, and competency-based education. This establishes the importance of competency in providing a rich field for studies in medical education.

2.6.2 The Inception of Competency Movement

The competency approach did not result directly from recent scandals of incompetent doctors. It originated from parallel developments in vocational training in countries, such as the national qualifications framework in New Zealand, the national training board in Australia, the national skills standards initiative in the United States, and the

national vocational qualifications (NVQs) in the United Kingdom, (Barnett,1994). The basic essential elements consist of functional analysis of the occupational roles, translation of these roles (competencies) into outcomes, and assessment of trainees' progress in these outcomes on the basis of demonstrated performance.

Assessments are based on a set of clearly defined outcomes so that all parties concerned, including assessors and trainees, can make reasonably objective judgments about whether or not each trainee has achieved them, (Wolf, 1995). Competence-based assessment is a form of assessment that is derived from a specification of a set of outcomes; that so clearly states both the outcomes-general and specific-that assessors, students and interested third parties can all make reasonably objective judgments with respect to student achievement or non-achievement of these outcomes. Accordingly, innovative assessment strategies according to

Tabish (2008) is entering every phase of professional development. Competency assessment and evaluation are crucial steps in innovative educational process. Before making a choice of assessment method, some important questions must be asked: what should be assessed? Why assess? For an assessment instrument one must also ask: is it valid? Is it reliable? Is it feasible? What is assessed and which methods are used will play a significant part in what is learnt. A wide range of assessment methods currently available include essay questions, patient management problems, checklists, student projects, Constructed Response Questions (CRQs), Critical reading papers, rating scales, extended matching items, tutor reports, portfolios, short case assessment and long case assessment, log books, trainer's report, simulated patient surgeries, simulators, self-assessment, peer assessment and standardized patients.

Other assessment tools according to Tabish (2008) include Chartered Stimulated Recall Examination (CSRE), Capstone Projects (CP) Performance Audit Assessment (PAA), Essay/Modified Essay Questions (MEQ), Multiple Choice Questions (MCQ), Objective Structured Clinical Examination (OSCE), Patient Management Problems (PMP), Performance Based Assessment of Skills (PBAS), Portfolio/Diary Based Assessment (PBA), Short/Long Answer Questions (SAQ, LAQ), Standardized Oral/Viva/Patient Examination (SOE), True False Items Examination (T/F), Written Interactive Tests (WIT), Best Evidence-Based Assessment (BEBA), Course Embedded Assessment (CEA), and Computer Assisted Assessment (CAA).

Assessment has a powerful positive steering effect on learning and the curriculum. It conveys what we value as important and acts as the most cogent motivator of student learning. Assessment is purpose driven. In planning and designing assessments, it is essential to recognize the stakes involved in it. The higher the stake, the greater the implications of the outcome of the assessment. The more sophisticated the assessment strategies, the more appropriate they become for feedback and learning. However, measuring progress in acquiring core knowledge and competencies may be a problem if the assessments are designed to measure multiple integrated abilities, such as factual knowledge, problem solving, analysis and synthesis of information. Students may advance in one ability and not in another. Therefore, progress tests that are designed to measure growth from the onset of learning until graduation should measure discrete abilities. However, the process of developing competencies allows some governments to influence what should included as important competencies and to allocate resources based on outcomes of performance, (Leung, 2002).

2.6.3 Definition of Competence in Relation to Curriculum Development

In curriculum development, competence is defined as the unique blend of knowledge, skills and attitudes required by health professionals to carry out their roles, (Eraut, 1994). Competency is noted when a learner is observed performing a task or function that has been established as a standard by the profession. Competency refers to professionals possessing the necessary ability, knowledge, skill, attitudes or behaviours to do or perform a particular task. Accordingly, competence is expressed as sufficient in amount, quality or degree, which could have the positive meaning of getting the job done or the negative meaning of adequate but less than excellent according to circumstances.

In reference to curriculum, it has been strongly argued that, in the world of social science, one of the ideas whose time had come was that of competency based education and training. This is an appealing concept whose aim is to delineate, in explicit terms, the competencies an individual should have at the completion of an educational course, (Schwartz *et al*, 1997). Schwartz *et al* proposed that those aspects of professional competence and professional socializations that are being emphasized in professional medical education programmes are summarized as generic and attitudinal outcomes. The generic outcomes include six aspects of professional competence listed as:

- (1) Conceptual competence.
- (2) Technical competence.
- (3) Contextual competence.
- (4) Interpersonal communication competence.
- (5) Integrative competence.

(6) Adaptive competence.

Attitudinal outcomes are addressed as:

(1) Career marketability.

(2) Professional identity.

(3) Professional ethics.

(4) Scholarly concern for improvement of the profession and motivation for continued learning.

2.6.4 Core Competencies

Core competencies can be defined as the essential knowledge and skills required of all medical practitioners in order to think, talk and act like a doctor. Every physician needs to be able to make a correct diagnosis, an essential first step to the next one: treatment and prognosis, (Miettinen & Flegel, 2003). Thereafter, it is the physician's duty to teach the patient about the illness and its probable course. Core training should also ensure that all physicians are able to perform critical appraisals of medical literature, to communicate with their patients and other health professionals, to understand the ethics of their profession and basic public health principles.

2.6.5 Development of Competence

Four relatively recent educational initiatives in particular are designed to build competence in the translation of generalized scientific knowledge into the care of individual patients. Accreditation Council for Graduate Medical Education (ACGME, 2001) established that these are problem-based learning, the practice of evidence-based medicine, learning to use clinical guidelines and outcome based-medical education.

2.6.6 Problem-Based Learning

Medical education is in the constant process of change, which makes it a challenging and fascinating field of study (Lonka, 2000). Introduced in the 1960s, problem-based learning replaces traditional passive biomedical knowledge transfer (lectures, readings) with a quasi-experiential method of acquiring basic biomedical concepts (Wood, 2003). In problem-based approach, written cases rather than living patients (hence "quasi-experiential") serve as triggers for the definition of students' learning goals and for independent self-directed learning, which is then refined in small group discussions under coaching by a faculty educator, (Kincade, 2005 and Nandi *et al*, 2000). Previous research indicates that PBL students are more likely to study for meaning and less likely to study for reproduction of information (Albanese & Mitchell, 1993). This may be one of the reasons why PBL has spread into an increasing number of medical faculties, including older and more traditional universities (Lowry, 1993).

2.6.7. Evidence-Based Medicine

As it is currently defined; the practice of evidence-based medicine involves systematic and judicious application of the best available research evidence in the clinical care of individual patients and patient groups. Learning rigorous methods for formulating clear answerable clinical questions, searching the medical literature, and critically appraising research studies are the working-knowledge cornerstones of this approach. Translating relevant evidence into practice requires learning how to judge the relevance of research information to the problems of individual patients, and applying it to those patients in the context of local practices.

Teaching the practice of evidence-based medicine at the undergraduate, graduate, and practitioner level has been shown to improve clinical knowledge, critical appraisal skills, the use of original studies to answer clinical questions, attitudes about the role of evidence, and clinical behaviour. It has been proven to be most effective when it is integrated with "bedside" clinical teaching, in contradiction to its use in classroom settings (Coomarasamy, 2004; Bradley *et al.*, 2002).

2.6.8. Learning to use clinical guidelines

Valid, credible clinical guidelines are based on exhaustive review and critical appraisal of medical literature. Evaluating the quality of clinical guidelines and applying them in practice can therefore, serve as important proxies for direct retrieval and use of research information. For these reasons, learning about how best to use clinical guidelines is now considered a legitimate and important element in continuing medical education. Well-constructed and precisely worded clinical guidelines help to adapt research evidence to individual patients since they take into account a range of patient characteristics, (Michie & Johnston, 2004).

Despite many barriers to their validity, generalizability and effectiveness, the use of clinical guidelines and protocols have been shown to be capable of making practice more reliable and more consistent with evidence from research, (Grimshaw *et al.*, 2004).

2.6.9 Outcome-based Education

Harden *et al.*, (1999) described outcome-based education as a way of developing competence.

The emphasis here is on the product, what sort of doctor or professional will be produced, rather than on educational process. In innovative outcome-based medical education the educational outcomes are clearly and unambiguously specified. These determine the curriculum content and its organisation, the teaching methods and strategies, courses offered, assessment process, educational environment, curriculum timetable and a framework for curriculum evaluation, which are, in effect, educational process.

Therefore, innovative outcome-based education had been defined as "a way of designing, developing, delivering and documenting instruction in terms of its intended goals and outcomes". Harden (1986) had also proposed some useful questions to be used in developing an innovative and competency-based medical curriculum, stating some examples as:

- What sort of doctors or professionals will the programme produce?
- What competencies will they possess?
- What basic skills, including personal, transferable and communication skills will they possess?

Almost all advocates of educational change accept that learning outcomes should occupy a key position in curriculum planning. Eraut (1994) cited five areas of competence that have been developed in medicine to be. These include;

(a) Clinical Skills

The ability to acquire clinical information by talking with and examining patients and interpreting the significance of the information obtained.

(b) Knowledge and Understanding

The ability to remember and apply relevant knowledge about clinical conditions in order to provide effective and efficient care for patients.

(c) Interpersonal Attributes

The expression of those aspects of a physician's personal and professional character that is observable in interaction with patients

(d) Problem - solving and Clinical Judgement

The application of relevant knowledge, clinical skills and interpersonal attributes to the investigation, diagnosis and management of the clinical problems of a given patient.

(e) Technical Skills

This is the ability to use special procedures and techniques in investigating and managing patients. The development of competence depends on the teaching methods employed, the learning approaches of the students and facilities or resources within the institution as had been proposed by Harden & Davis, (1995).

2.7 Theories of Innovative Medical Curriculum Design.

Arguably, the most innovative and influential educational theory of medical curriculum design in modern times is the SPICES model, proposed by Harden *et al*, (1984). The SPICES model has had a major effect, highlighting a move away from teaching with a hospital based and didactic curriculum content to a more well-directed

learning utilizing all available health learning opportunities but underpinned by systematic curriculum content. The educational pillars of the SPICES curriculum model as defined by Harden are:

S	Student centred	<i>Vs</i>	Teacher centred	T
P	Problem based	<i>Vs</i>	Information gathering	I
I	Integrated	<i>Vs</i>	Discipline based	D
C	Community based	<i>Vs</i>	Hospital based	H
E	Elective	<i>Vs</i>	Uniform/Standard	U
S	Systematic	<i>Vs</i>	Apprenticeship	A

The purposes of this SPICES model include:

- To review an existing curriculum to see where improvements can be made
- To develop a new curriculum from scratch
- To tackle specific questions or issues relating to a curriculum
- To help decide on what sort of teaching methods to use on a course
- Decide on what format the assessment should take

2.7.1 Student centred Vs teacher centred

Student centred strategy asks for an active role of student in the process of definition of curriculum, decision about learning methodology and decisions on what and when they will study employing Self Directed Learning (SDL). This has been identified as an important skill for medical graduates. To meet the challenges in today's healthcare environment, self-directed learning is most essential.

In self-directed learning, learners take the initiative in making use of resources rather than simply react to transmissions from resources, thus helping learners to learn more and learn better. The concept of self-directedness in learning was discussed in educational literature by Harvey (2003) where preliminary description of self-directed learning emerged.

Self-directed learning, in the broadest sense, describes a process in which individuals take the initiative with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying resources for learning, choosing and implementing learning strategies and evaluating learning outcomes. Lifelong, self-directed learning (SDL) has been identified as an important ability for medical graduates. The second strategy is based on teacher decisions on what, when and how certain subjects or courses will be studied.

2.7.2 Problem based Vs information gathering

Problem based or problem solving strategy is based on student acquisition of knowledge through process of clinical problem solving. Information gathering is a strategy based on student presentation of gathered information or facts, Harden (1984).

2.7.3 Integrated Vs disciplinary

This strategy is based on integration of different disciplines. Mostly integration is made around certain organ systems. Basic sciences, preclinical and clinical subjects are integrated around the organ system which they studied earlier on, Harden (1984).

2.7.4 Community based Vs hospital based

Community based teaching is educational strategy based on studying in community health centres, while in hospital based strategy educational process is based on hospitals which represent teaching base for faculty, Harden (1984).

2.7.5 Elective Vs standard

In the elective strategy, studying process is organized in a way that all students have the same core curriculum while they choose certain aspects which they want to study more deeply through elective courses. In standard curriculum all students have the same curriculum without possibility to choose elective subjects, Harden (1984).

2.7.6 Systematic Vs apprenticeship

In a systematic approach, teaching and learning experience are planned while in opportunistic approach, students follow the experience of departmental doctor as it is. In this innovative competency-based and holistic system, the key question becomes who determines the desired outcomes. The important influences on curriculum in this century are likely to be external, with pressure from public and political groups defining the needs of society and the role of the doctor (Roberts, 2004).

This is a situation where the curriculum delivered will be constrained by practical issues and the political drive will perch for more into the community. The content of the curriculum will be shaped by similar influences, but also by the health needs of the changing populations' new medical knowledge and the possible changing role of the doctor from patient advocate to health resource manager.

To cope with these influences, the curriculum will have to be a dynamic concept in itself and no single curriculum is likely to produce the variety of doctors or health professionals required to meet the changing societal needs. Not only does the curriculum need to be dynamic, but it also needs variance at any one point in time across the differing needs of the communities the product doctors will serve. Those responsible for curriculum design may feel hard pressed by external agencies for reforms of a particular kind and these should be treated as opportunities of change to improve medical education in a positive manner according to an observation summed up by Roberts (2004).

2.8 Shift of Paradigms in Medical Curriculum Development

Nearly a century ago, Abraham Flexner (1910), a research scholar at the Carnegie Foundation of the Advancement of Teaching, undertook an assessment of medical schools in Northern America and Canada, visiting all 155 medical schools in operation then, whose report, addressed to the public primarily, helped change the face of American medical education and eventually the whole world (Flexner 1910).

Although reform in medical education at that time was already underway,

Flexner's report fuelled change by criticizing the mediocre quality and profit motive of many schools and teachers, the inadequate curricular and facilities at a number of schools and non-scientific approach to preparation of the profession which contrasted with the university-based system of medical education.

At the core of Flexner's view was the notion that formal analytic reasoning, the kind of thinking integral to the natural sciences should be integrated in the intellectual training of physicians. This ideal was pioneered at Harvard University, the University of Michigan and the University of Pennsylvania in the 1880s but was most fully expressed in the educational programme at John Hopkins University which Flexner's report had been regarded as ideal for medical education.

In addition to scientific foundation for medical education, Flexner (1910) envisioned a clinical phase of education in academically oriented hospitals, where, thoughtful clinicians would pursue research stimulated by the questions that arose in the course of patient care and teach their students to do the same. To Flexner, research was not an end in its own right; it was important because it led to better patient care and teaching. Indeed, he subscribed to the motto of, "think much and publish little" (Flexner, 1940).

Professional education has not kept pace with these challenges, largely because of fragmented, outdated, and static curricula that produce ill-equipped graduates. The problems are systemic: mismatch of competencies to patient and population needs; poor teamwork; persistent gender stratification of professional status; narrow technical focus without broader contextual understanding; episodic encounters rather than continuous care; predominant hospital orientation at the expense of primary care; quantitative and qualitative imbalances in the professional labour market; and weak leadership to improve health-system performance.

Laudable efforts to address these deficiencies have mostly floundered, partly because of the so-called tribalism of the professions including the tendency of the various professions to act in isolation from or even in competition with each other, (Ludmerer, 2003).

2.8.1 Transformation of Medical Education in the 20th Century

Medical academic environment has been widely transformed since Flexner's day in several aspects; In teaching hospitals, research quickly outstripped teaching in importance and publish or perish culture emerged in many Universities and Medical schools. Today's subordination of teaching to research as well as the narrow gaze of present medical education on biologic matters represents a long-standing tradition, as had been indicated by (Ludmerer, 2003).

In addition to the shift in the importance of research relative to teaching and patient care, a transformation in the process of research on human disease has contributed to the current state of affairs, Ludmerer, (2003) argued. It has then been observed that, for the first half of the 20th century, a distinctive feature of medical education was the integration of investigation with teaching and patient care. Gifted clinical investigators tendered to be equally gifted as clinicians and clinical teachers.

After 1960s, however, as medical research become increasingly molecular in orientation, patients were bypassed in most cutting-edge investigations and immersion in the laboratory became necessary for the most prestigious scientific projects. Clinical teachers and educators came under intense pressure to increase their clinical productivity, which is to generate revenue by providing care for paying patients.

In addition, the harsh, commercial atmosphere of the market place has permeated many academic medical institutions, (Tarquino *et al*, 2003). Students hear institutional leaders speaking more about “throughput” capture of the market share” “units of service” and the financial “bottom line” than about competent prevention and relief of suffering.

Students learn from this culture that health care as a business may threaten medicine as a calling, a strong argument which has been fronted by Tarquino *et al*, (2003).

Thus, the present predicament is reached, where medical students and residents are often taught clinical medicine either by faculty who spent very limited time seeing patients and honing their clinical skills (and who regard the practice of medicine as a secondary activity in their careers) or by teachers who have little familiarity with modern biomedical science (and who see few if any, academic rewards in leaving their busy practices to teach). In either case, many clinical teachers no longer exemplify Flexner’s model of the clinician-investigator, educator or curriculum expert, (Williams *et al*, 2003).

2.8.2 Medicine as Professional Education in the 21st Century.

What should be done to bring the knowledge, skills and values that must be inculcated by medical education into better balance and to prepare outstanding physicians for the 21st century depends on individual institutions offering or sponsoring medical education programmes. Institutions need to have the will to develop and implement innovative strategies of teaching and learning. Previous studies indicate that cognitive psychology has demonstrated that facts and concepts are best recalled and put into service when they are taught, practiced, and assessed in the context in which they will

be used as established (Cooke *et al*, 2006). The acquisition of skills for practice requires radical transformation, though the dictum “see one, do one, teach one” may have characterized the way in which clinical skills were learned in the past. It is now clear that for training in clinical skills to be effective, learners at all levels must have the opportunity to compare their performance with a standard and to practice until an acceptable level of proficiency is attained, (Cooke *et al*, 2006).

Therefore, the foundations that can be laid down by explicit instruction in professionalism, combined with effective role modelling and attention to innovative competency-based medical curriculum can support the development of comprehensive and sophisticated understanding of professional education as it has been observed that assessment in these contexts drives teaching and learning (Epstein & Hundert, 2002). In these narratives, the authors have stated that, if we care, whether medical students and residents become skilful practitioner and sensitive compassionate healers, educators as well as knowledgeable technicians, our approaches to evaluation of learners must reach beyond knowledge.

Evaluation should vigorously assess procedural skills, judgment and commitment to patient’s self-assessment, peer evaluations, portfolios of learners’ work, and written assessments of clinical reasoning, standardized patients’ examinations, oral examinations and sophisticated simulations that are increasingly used to support the acquisition of appropriate professional values as well as knowledge, reasoning and skills.

New paradigms that connect these processes are emerging in new curricula and they have the potential to revolutionize both the ways in which people learn and the environment in which learning takes place.

2.8.3 Finding the will to Change the Curriculum

The need for a fundamental redesign of curriculum content of medical education according to Miettinen (2003) is clear. In some instances, the road that needs to be taken is also clear. That is, more emphasis should be placed on social and political aspects of the health care delivery. However curriculum reform is never simple or easy and tough battles are inevitable. The challenge is not defining the appropriate content but rather incorporating it into the curriculum in a manner that emphasizes its importance relative to the traditional biomedical context and then finding and preparing faculty to teach this revised curriculum. Reforms of the process of curriculum development and clinical education are even more challenging, however, both regulatory and voluntary efforts are under way as was proposed by Harden *et al* (2001).

In these narratives, they had stated that, some medical schools are setting out to identify and support a cadre of outstanding clinicians, teachers and physician scientists who are academic medicine's first-class citizens and who hold promise for developing innovative programmes and providing the attentive supervision, assessment, and mentoring that beginning physicians need. Good teaching, whether it is conducted in the classroom, clinic or hospital, requires time and facts. Innovative approaches to teaching, progressive skills instruction, assessment, and support of development of professionalism all require teachers, who have the time to observe,

instruct, coach, and assess their students and who also have time for self-reflection on their own professional development (Miettinen, 2003). Medical education has to reconfigure itself in response to changing scientific, social and economic circumstances in order to flourish from one generation to the next by means of an innovative and competency-based medical curriculum.

Teachers of health professional education have to be well-informed of the trends and innovations and to utilize these trends to increase relevance and quality of education to produce competent human resources (Majumder *et al*, 2004). Accordingly, the purpose of this argument is twofold:

- (i) To discuss innovative strategies and emerging trends, which have been successfully adopted by educators around the world for the reorientation of medical education to overcome existing traditions of educational planning, review and development and
- (ii) To highlight their implications and importance to initiate need-based reforms of medical training.

2.8.4 Value of a new paradigm for Medical Curricula

Boelen (2009), observed that Flexner's (1910) recommendations for "reconstruction" of medical education have been generally applied to medical schools across the globe. Strict policies on student admission into medical schools, a strong emphasis on basic sciences in the educational programme and the use of a University Hospital for ample clinical exposure. The availability of laboratories and appropriate facilities, equipped with relevant learning resources are some of the criteria which have been widely used to access the quality of modern medical education.

Medical schools and medical educators could certainly play a significant role in ensuring that medical education contributes to a greater extent in meeting the priority health concerns of the people individually and collectively. Boelen (2009) accepted these facts, though with suggestions that it would require a fundamental shift in mindset of those responsible for the design or redesign of institutions as well as of action programmes as people's health needs need to be taken as a starting point and not as an end.

The Flexner (1940) report had a high value in the sense that it referred to concepts such as the "patriotism" of medical institutions, the role of the medical profession, the need for a fair geographical distribution of medical manpower and a general accountability to the public. Scientific foundations in innovative medical curriculum of today should be seen as a means to enable medical schools to go further in their scientific enquiry and to review critically their potential to improve their social responsiveness, a message already advanced by WHO (1999).

A new paradigm of social accountability of medical schools implies that medical schools should be held accountable for their products, be they medical graduates, educators or models of health service delivery by demonstrating how these products contribute to improving quality, equity, relevance and cost-effectiveness in health services.

2.9 Role of “Global Minimum Essential Requirements” (GMER) in Innovative Medical Curriculum Planning and Development Making Process.

The process of globalization which is becoming increasingly evident in medical education makes the task of defining the global essential competencies required by the “global physicians” an urgent matter according to the Institute for International Medical Education (IIME, 1999). The IIME project developed the concept of Global Minimum Essential Requirements (GMER) and defined a set of global minimum learning outcomes which students of medical schools must demonstrate at graduation. Besides these global competencies, medical schools should add national and local requirements, (IIME, 1999).

The focus on student competencies as outcomes of medical education should have deep implications for innovative and competency-based medical curriculum development and its content as well as the educational processes of medical schools (core curriculum). The Institute for International Medical Education (IIME), established in 1999 was given the task of providing leadership in defining these global minimum essential requirements (essentials) for undergraduate medical programmes.

These cores of medical curriculum “essentials” were to consist of *medical knowledge, clinical skills, professional attitudes, behaviours and ethics* that all physicians must possess regardless of where they trained. The IIME committee comprised of international medical education experts and senior medical education and health policy experts with broad national and international experiences.

Medical school graduates should demonstrate professional competencies which will ensure that high quality care could be provided with empathy and respect for patient's wellbeing. Graduates should be able to integrate management of illness and injury with health promotion and disease prevention and be able to work in multi professional teams. In addition, they should be able to teach, advice, counsel patients, families and the public about illness, risk factors and health lifestyles. They should also be able to adapt to the changing patterns of diseases conditions and requirements of medical practice, medical information technology and scientific advances and changing organization of health care delivery, while upholding the highest standards of professional values and ethics.

2.9.1 Medicine as a Global Profession

As observed from the tasks undertaken by IIME (1999), globalization forces are increasingly becoming evident in innovative medical education curriculum. Since medicine is a global profession, medical knowledge and research have naturally and traditionally crossed national boundaries, allowing physicians to study and provide medical services in various countries of the world. Although at first glance, global innovative medical curricula appear similar, their content, teaching strategies and assessment methods varies greatly (ACGME, 1999). Globally, health services and medical practice are undergoing profound changes driven and faced by economic difficulties in financing health care systems.

In pursuing the “global essential requirements” medical schools will adapt their own particular curriculum design, but in doing so, they must ensure that their graduates possess the core competencies envisioned in the minimum essentials and in short they must “think globally and “act locally” (IIME, 1999).

The "Essentials" are grouped under seven broad educational domains with a set of sixty learning objectives in total. These domains are considered to be truly essential, that is, every physician must possess in order to be called a physician. These domains are of crucial importance for practicing medicine in the 21st century and accordingly have a profound impact on their training curricular internationally, nationally and locally. The following are 60 learning objectives set out by Institute for International Medical Education (IIME, 1999), and which have stood the test of time in guiding curriculum development, their meanings and what are intended to cover as grouped by the domains.

2.9.2 Professional Values, Attitudes, Behaviours and Ethics

- 1) Recognition of the essential elements of the medical profession, including moral and ethical principles and legal responsibilities underlying the profession.
- 2) Professional values which include excellence, altruism, responsibility, compassion, empathy, accountability, honesty and integrity, and a commitment to scientific methods.
- 3) An understanding that each physician has an obligation to promote, protect, and enhance these elements for benefit of patients, the profession and society at large.
- 4) Recognition that good medical practice depends on a mutual understanding and relationship between the doctor, the patient and the family with respect for patient's welfare, cultural diversity, beliefs and autonomy.

- 5) An ability to apply the principles of moral reasoning and decision-making to conflicts within and between ethical, legal and professional issues including those raised by economic constraints, commercialization of health care, and scientific advances.
- 6) Self-regulation and recognition of the need for continuous self-improvement with an awareness of personal limitations including limitations of one's medical knowledge.
- 7) Respect for colleagues and other health care professionals and the ability to foster a positive collaborative relationship with them.
- 8) Recognition of the moral obligation to provide end of life care, including palliation of symptoms.
- 9) Recognition of ethical and medical issues in patient documentation, plagiarism, confidentiality and ownership of intellectual property.
- 10) Ability to effectively plan and efficiently manage one's own time and activities to cope with uncertainty, and the ability to adapt to change.
- 11) Personal responsibility for the care of individual patients.

2.9.3 Scientific Foundation of Medicine

- 1) The normal structure and function of the body as a complex of adaptive biological system.
- 2) Abnormalities in body structure and function which occur in diseases.
- 3) The normal and abnormal human behaviour.
- 4) Important determinants and risk factors of health and illnesses and of interaction between man and his physical and social environment.

- 5) Molecular, cellular, biochemical and physiological mechanisms that maintain the body's homeostasis.
- 6) The human life cycle and effects of growth, development and aging upon the individual, family and community.
- 7) The aetiology and natural history of acute illnesses and chronic diseases.
- 8) Epidemiology, health economics and health management.
- 9) The principles of drug action and its use, and efficacy of various therapies.
- 10) Relevant biochemical, pharmacological, surgical, psychological, social and other interventions in acute and chronic illness, in rehabilitation, and end-of-life care.

2.9.4 Communication Skills

- 1) Listen attentively to elicit and synthesize relevant information about all problems and understanding of their content.
- 2) Apply communication skills to facilitate understanding with patients and their families and to enable them to undertake decisions as equal partners.
- 3) Communicate effectively with colleagues, faculty, the community, other sectors and the media.
- 4) Interact with other professionals involved in patient care through effective teamwork.
- 5) Demonstrate basic skills and positive attitudes towards teaching others.
- 6) Demonstrate sensitivity to cultural and personal factors that improve interactions with patients and the community.
- 7) Communicate effectively both orally and in writing.
- 8) Create and maintain good medical records.

- 9) Synthesize and present information appropriate to the needs of the audience, and discuss achievable and acceptable plans of action that address issues of priority to the individual and community.

2.9.5 Population Health and Health Systems

Medical graduates should understand their role in protecting and promoting the health of a whole population and be able to take appropriate action. They should understand the principles of health systems organization and their economic and legislative foundations. They should also have a basic understanding of the efficient and effective management of the health care system. The graduates should be able to demonstrate:

- 1) Knowledge of important life-style, genetic, demographic, environmental, social, economic, psychological, and cultural determinants of health and illness of a population as a whole;
- 2) Knowledge of their role and ability to take appropriate action in disease, injury and accident prevention and protecting, maintaining and promoting the health of individuals, families and community;
- 3) Knowledge of international health status, of global trends in morbidity and mortality of chronic diseases of social significance, the impact of migration, trade, and environmental factors on health and the role of international health organizations.
- 4) Acceptance of the roles and responsibilities of other health and health related personnel in providing health care to individuals, populations and communities;

- 5) An understanding of the need for collective responsibility for health promoting interventions which require partnerships with the population served, and a multidisciplinary approach including the health care professions, as well as, intersectoral collaboration;
- 6) An understanding of the basics of health systems including policies, organization, financing, cost-containment measures of rising health care costs, and principles of effective management of health care delivery;
- 7) An understanding of the mechanisms that determine equity in access to health care, effectiveness, and quality of care;
- 8) Use of national, regional and local surveillance data as well as demography and epidemiology in health decisions;
- 9) A willingness to accept leadership when needed and as appropriate in health issues.

2.9.6 Critical Clinical Skills

The graduates must diagnose and manage and take care of patients in an effective and efficient way. In order to do so, he/she must be able to:

- 1) Take an appropriate history including social issues such as occupational health;
- 2) Perform a thorough physical and mental status examination of a patient;
- 3) Apply basic diagnostic and technical procedures, to analyze and interpret findings, and to define the nature of a problem;
- 4) Perform appropriate diagnostic and therapeutic strategies with the focus on life-saving procedures and applying principles of best evidence medicine;
- 5) Exercise clinical judgment to establish diagnoses and therapies;

- 6) Recognize immediate life-threatening conditions;
- 7) Manage common medical emergencies;
- 8) Manage patients in an effective, efficient and ethical manner including health promotion and disease prevention;
- 9) Evaluate health problems and advise patients taking into account physical, psychological, social, economic and cultural factors;
- 10) Understand the appropriate utilization of human resources, diagnostic interventions, therapeutic modalities and health care facilities.

2.9.7 Management of Information

The practice of medicine and management of a health system depends on the effective flow of knowledge and information. Advances in computing and communication technology have resulted in powerful tools for education and for information analysis and management. Therefore, graduates have to understand the capabilities and limitations of information technology and the management of knowledge, and be able to use it for medical problem solving and decision-making. The graduate should be able to:

- 1) Search, collect, organize and interpret health and biomedical information from different databases and sources;
- 2) Retrieve patient-specific information from a clinical data system;
- 3) Use information and communication technology to assist in diagnostic, therapeutic and preventive measures, and for surveillance and monitoring health status;
- 4) Understand the application and limitations of information technology;
- 5) Maintain records of his/her practice for analysis and improvement.

2.9.8 Critical Thinking and Research

Good medical practice requires the ability to think scientifically and use scientific methods. The ability to critically evaluate existing knowledge, technology and information is necessary for solving problems, since physicians must continually acquire new scientific information and new skills if they are to remain competent.

Medical graduate should therefore, be able to:

- 1) Demonstrate a critical approach, constructive scepticism, creativity and a research-oriented attitude in professional activities;
- 2) Understand the power and limitations of the scientific thinking based on information obtained from different sources in establishing the causation, treatment and prevention of disease;
- 3) Use personal judgments for analytical and critical problem solving and seek out information rather than to wait for it to be given;
- 4) Identify, formulate and solve patients' problems using scientific thinking and based on obtained and correlated information from different sources;
- 5) Understand the roles of complexity, uncertainty and probability in decisions in medical practice;
- 6) Formulate hypotheses, collect and critically evaluate data, for the solution of problems.

The presented Global Minimum Essential Requirements (GMER) are considered an instrument for improvement of the quality of medical education and directly or indirectly of the medical practice. It is hoped that the IIME (1999) project will have significant influence on innovative medical school curricular and educational processes paving the road to the competence oriented medical education.

2.10 Curricular Reforms to meet the Changing Health Care Needs

Today's medical curricula make students to learn on their feet, in the examination room, in the clinic and in the community, making a move from lecture halls to community clinics, as opposed to the old tradition that used to be a jammed lecture hall that was a typical leaning environment, (Cohen, 2009). Most medical treatments used to be delivered in the hospital on an inpatient basis but today, most people receive medical treatment in ambulatory care settings in some countries such as USA and Canada. This happens through rotations at work in clinics, community health centres, rape crisis centres, schools and shelters for the homeless and survivors of domestic and political violence, (AAMC, 2009).

Therefore, today's medical school's innovative medical curriculum provide a wealth of opportunities for students to learn in this new environment. The goal being to teach students the values, attitudes and skills necessary to provide quality care while maximizing the use of resources. In the old days of traditional curriculum of medicine, the doctor used to speak and the patient listened while in today's medical schools there is an increased focus in making sure that the doctor listens to the patient as well. According to these arguments, patients educate physicians and physicians educate patients.

In the modern medical schools, an educator doesn't always wear a white coat or carry the title "MD, Professor or Surgeon" quite often, the best teaching comes from the patient. Under such settings according to a study by Cohen (2009), increasing numbers of medical schools are using standardized patients to test their student's clinical skills.

Standardized patients are either trained volunteers acting in the role of a patient or actual patients giving students opportunity to, not only test their medical knowledge but also to hone their communication skills. When it comes to complex subjects like spirituality, death and dying, patients are often the best teachers. In hospices and homes, innovative medical curricula allow students to have the difficult but life changing opportunity to partner with patients who have life threatening illnesses, following their progresses and learning in a deeply personal way about the process of death and dying, (Batalden & Davidoff, 2007).

2.11 Theoretical Framework

In support of this study, a theoretical framework, Akturk, (2012) argued from the question point of view that, a university based programme must reflect the mission and values of the parent institution and faculty as well as the needs of the society in which it exist, derive support and develop approaches for keeping innovative medical curriculum live and healthy. From these considerations, a set of guiding core values or principles are defined which underlie the process of innovative curriculum development. An undergraduate programme must therefore define those competencies and use them to guide appropriate curricular structures that will allow a novice learner to progress to the point of preparation for subspecialty training and lifelong learning. Doing so is essential to the development of a comprehensive, integrated and innovative curriculum, in which each competency will be linked with learning and evaluative elements intended to ensure that they are achieved.

Innovative medical curriculum within the theoretical framework of basic innovative medical education focuses on educators so as to add value to the mentorship process, learners and learning outcomes in terms of competencies regarding what they know, can do and how they can live with other people, Kelly (1999). It seeks to conform to the prescriptions for curriculum innovations as outlined in Tomorrow's Doctors as mandated by the General Medical Council (GMC, 2003). Under these considerations, the SPICES model type of innovative medical curriculum, Harden (1984) serves as the guiding theory.

2.12 Conceptual Framework.

The Conceptual Framework for this study was defined in terms of "Harden's Ten Questions to ask" when planning an innovative medical curriculum, (Harden, 1986).

The framework was used as a guide in developing the research instrument in relation to innovative medical curriculum making process. An undergraduate programme must therefore, define those competencies and use them to guide appropriate curricular structures that will allow a novice learner to progress to the point of preparation for subspecialty training and lifelong learning.

Doing so is essential to the development of a comprehensive, integrated and innovative curriculum in which each competency will be linked with learning and evaluative elements intended to ensure that they are achieved. Harden's Questions linked to the conceptual framework areas are;

1. What are the needs of the learners? This refers to learners characteristics
2. What should be the learning outcomes? Attributes learners must possess

3. What content should be covered? Refers to core and electives
4. How should the content be organized? This relates to course structure.
5. What educational strategies should be employed? To student/teacher centred
6. What are the teaching methods to be used? Teaching/learning styles
7. What are the assessment methods/strategies to be used? This emphasised assessment of knowledge, skills application and attitudes
8. How should the curriculum be communicated to the stakeholders? This refers to community being served
9. What educational climate should be fostered? This involves the setting of induction to make participants active.
10. How should the curriculum be managed and evaluated? This relate to implementation represented in curriculum as adopted from Harden, (1986), as represented diagrammatically below;

Conceptual Framework

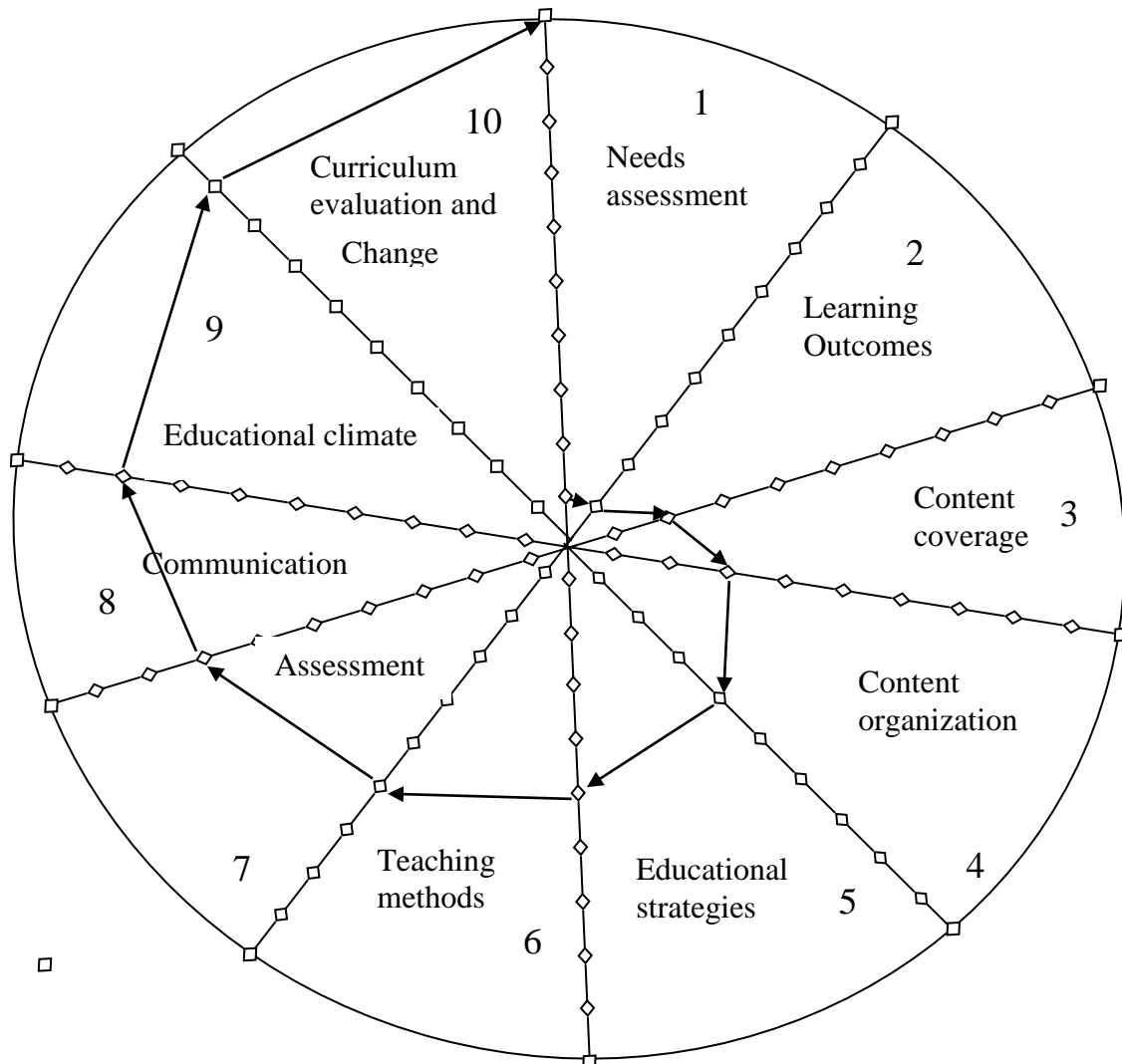


Figure 2.1 Innovative Curriculum Wheel

This conceptual framework indicates the way ideas in ten step innovative medical curriculum were organized to achieve the research project's process.

CHAPTER THREE

RESEARCH METHODOLOGY.

3.1 Introduction

This chapter deals with the study design and methodology, study site, target population, a description of the strategy used, the procedure followed in the study and the instruments used for data collection.

3.2 Study Site

The study was conducted at the Moi University, College of Health Sciences, which comprises the Schools of Medicine, Public Health, Dental and Nursing. The College of Health Sciences, is located in Eldoret town next to and within the Moi Teaching and Referral Hospital. It was established as the first College campus of Moi University on 20th September 2011 during the inauguration of the first Principal. The establishment of the College of health Sciences is in line with the Moi university strategic plan of 2005-2015.

The College started as a Faculty of Health Sciences in 1989 and the first cohort of 40 students was admitted in 1990 (Moi University, Strategic Plan, 2006). The College has experienced phenomenal growth from its initial one faculty to a total of four Schools (Schools of Medicine, Public Health, Dentistry and Nursing). It has a student population of about 2,000 with a staff complement of over 500 of whom about 170 are academic staff

3.3 Research Design

This was a quantitative descriptive survey study design involving the collection of data in order to answer questions concerning the current status of the subjects in the study as proposed by Gay *et al*, (2006). Survey research is the method of gathering data from respondents thought to be representative of some population, using an instrument composed of closed, structured or open-ended item questions. This is one of the most dominant forms of data collection methods in social sciences, providing for efficient collection of data over broad populations and is amenable to administration in person, by telephone and even over the internet, (Garson, 2009).

3.4 Target Population

This was a census study which involved a total of 167 lecturers, at the Schools of Public Health, School of Medicine, School of Dentistry and School of Nursing within the College of Health Sciences, Moi University, who possess characteristics and working experiences sought in the study. Educators were chosen under criteria for selection in which they were considered to possess a wide range of professional competencies relevant to the study.

It was also believed that since the curricula followed at the College of Health Sciences is an innovative medical curriculum, a study on what educators perceived as their competence was relevant. According to Watson (2001), a researcher must first know the size of the population and characteristics of the respondents he or she is dealing with. If the population is small (200 respondents or less), it may be preferable to do a census study of everyone rather than a sample and gain a 0% sampling error.

Since a sampling frame of 167 as was obtained from the College of Health Science, a census study was conducted and a samples determination was not significant as seen from table 3.1.

Table 3. 1 Sampling Frame

S/No	Name of School	No educators /lecturers
1	School of Medicine	91
2	School of Public Health	30
3	School of Nursing	25
4	School of Dentistry	21
5	Total	167

3.4.1 Inclusion and Exclusion Criteria.

Educators in permanent employment were included in the study, provided that they were willing to participate. Educators who were not willing to participate in the study for their own reasons were excluded from the study. Educators who were on part time employment, external or visiting lecturers were excluded from the study. This is because they were considered not to necessarily possess the characteristics sought in terms of internal college activities or experiences and inconsistent presence.

3.5 Research Instrumentation

A questionnaire (Appendix I) containing both open and close ended questions, rating scales, likert and agreement scales was developed for data collection to be ministered to all the educators within the schools comprising College of Health Sciences. The questionnaire was administered by the researcher and one research assistant during each schedule as the tool for data collection.

All educators in the college of health sciences, who met the inclusion criteria of being full time lecturers, participated in the study. An introductory transmittal letter (appendix VII) explaining the purpose of the study, benefits and significance was attached to the questionnaires. Questions included in the questionnaire covered all the research objectives specified in the research study.

Data collected included issues on knowledge and understanding of curriculum process, competence of educators, curriculum models, curriculum needs, curriculum planning and development, content organization, curriculum resources, teaching strategies, instructional media, and educational environment, assessment process and a framework for curriculum implementation and evaluation.

3.6 Pilot Study

The researcher piloted the research instrument before putting it into use. The main objective of the pilot study was to establish validity and reliability of the research instrument before putting into use. The pilot subjects comprised twenty lecturers from Kenya Medical Training College (KMTC), Eldoret, who had a background in medical education. Bell (2005) emphasizes the role of piloting in ascertaining the validity of research instruments. This is done by asking the lecturers to read it through and see if there are any ambiguities which were not noticed. They were also asked to comment about the length, structure and wording of the questionnaire and were altered accordingly. Results of the pilot study were useful because the researcher used the findings to modify ambiguous and unclear items in the questionnaire.

3.6.1 Validity of the Research Instrument

This refers to the accuracy or truthfulness of a measurement, "correctness and soundness of results and conclusions reached in a study" (Kothari, 2004). In general, validity was an indication of how sound this research instrument was. More specifically, validity applied to both the design and the methods of this research. Validity in data collection was meant to establish that findings truly represented the phenomenon which was being measured. The face and content related validity of the instruments was determined by administering the questionnaire to colleagues with background on medical education so as to carefully and critically examine and assess the relevance of the items to the objectives of the study. From the pilot study results ambiguities were addressed and relevant corrections were made before putting it in to use.

3.6.2 Reliability of Instrument

Reliability is synonymous with repeatability or stability and the extent to which an instrument gives results that are consistent. The reliability of a research instrument used in this study concerned the extent to which the instrument would the yield the same results when administered as proposed by Kothari, (2004). Comments obtained from the pilot study formed the basis for modifying ambiguous and unclear items in the questionnaire before it was administered.

3.7 Data Collection Procedure

Quantitative types of data were collected from all the educators in the census population believed to possess the characteristics sought in the study during the months of March to April 2013 using a questionnaire as the only tool for data collection. Data was collected by the researcher with the help of one research assistant because of constraints of time and resources at designated times in the four Schools within the College of Health Sciences. This was when educators were either at tea, lunch break or in their offices, respectively.

3.8 Data Analysis

Appropriate descriptive statistical procedures were applied to address the research questions and hypothesis and these included the Statistical Packages for Social Science (SPSS) version 16 for windows. Means, modes and percentages were calculated and results were presented using of tables. Appropriate interpretations, discussions, conclusions and recommendations were made accordingly, in respect to the research findings.

3.9 Ethical Considerations

Ethical approval was sought and obtained from IREC, appendix V and College of Health Science appendix III before commencement of the study. The adoption of an ethical position in respect of any research requires that researchers observe and protect the rights of participants and act systematically to ensure that participants were able to exercise their rights according to CCCU (2006). Issues that were addressed by the researcher under ethical considerations included;

3.9.1 Informed and voluntary consent from participants

Under this criteria, the researcher obtained informed consent from all respondents and those who were directly involved in the research or in the vicinity of the research area. This principle adhered to a larger issue on respect to the participants so that they were not coerced into participation and have access to relevant information prior to responding to the questionnaire. Usually consent is obtained through written consent forms and necessary elements of consent were identified by the IREC review committee and College authority, appendix VI.

Consent was obtained through transmittal letter, appendix VII that was attached to the questionnaire, appendix I. The transmittal letter indicated to the respondents the research purpose, procedure, time period, risks, benefits, and the clause stipulating that participation was voluntary and the participants had the right to withdraw from the study at any time without penalty, as per CCCU (2006).

3.9.2 Confidentiality and anonymity of information sought from the respondents

The researcher strictly adhered to the principle concerned with offering respect and protection to research participants through assurance of confidentiality of information shared and anonymity by asking the respondents not to reveal their individual identities and institutions involved. Typically anonymity was provided through the use of pseudonyms which included coding of questionnaires.

3.9.3 No Harm to participants, beneficence and reciprocity

According to this principle the researcher provided the participants with an outline of the risks (if any) and benefits involved in the study through the transmittal letter.

The principle of reciprocity required that the researchers consider actively ways through which participants could be compensated for their time and effort when the study is completed. A clause stating that study findings will be communicated to them was included in the transmittal letter.

CHAPTER FOUR

RESULTS

4.1 Introduction

This chapter deals with results, presentation, analysis and interpretation of the data collected in the study. The study had sought to determine the competence, perception and participation of medical educators in innovative medical curriculum planning and development at Moi University, College of Health Sciences. Questionnaires were administered to 139 (83%) respondents out of 167 total population, and who were on site between the months of March and April 2013. There was 92 (66%) returned, 11 (12%) were incomplete and 81 (58%) valid questionnaires were analysed.

The chapter presents descriptive statistics on demographic characteristics of the respondents and inferential statistics in testing the hypothesis. Quantitative data were collected and analysis was done via SPSS Version 16 for windows and presentation was done using frequency tables. The above activities were guided by the research objectives and the research questions.

4.2 Demographic Information

Demographic information were characteristics relevant to this study.

4.2.1 Gender

Table 4. 1 Gender of the Respondents in Years

Gender	Frequency	Percent
Male	55	67.9
Female	26	32.1
Total	81	100.0

4.2.2 Age Range of the respondents

The ages of respondents was sought and their responses are contained in Table 4.2

Table 4. 2 Age Range of the Respondent in Years

Age Category	Frequency	Percent
21-35	17	21.0
36-45	26	32.1
46-55	25	30.9
56-65	12	14.8
66-75	1	1.2
Total	81	100.0

Findings indicate that majority of the respondents (32.1%) were between 36-45 years of age. This is followed closely by the group that falls between 46-55 years of age with (30.9%) being a middle age group. The study also found that the youngest generation of between 21-35 years of age forms the third largest group at (21%). However, senior generation of between 56-65 years of age accounted for (14.8%) while the most senior, 66-75 years of age is (1.2%).

4.2.3 Lecturing/educating period in years

Periods that respondents had been educating at Moi University in years are summarized in the frequency table 4.3.

Table 4. 3 Lecturing Period in Years

Lecturing Experience	Frequency	Percent
Less than 10	48	59.3
11-20	29	35.8
21-30	4	4.9
Total	81	100.0

It is revealed from table 4.3 that majority (59%) of the respondents who participated in this study had been educating students for less than ten years.

4.2.4: Professional Qualifications of the Respondents

In order to understand their characteristics, respondents were asked to specify their professional qualifications and the results are presented in table 4.4;

Table 4. 4 Professional Qualifications of the Respondents

Professional Qualification	Frequency	Percent
Medical Doctor	38	46.9
Dentist	6	7.4
Public/Environmental Health Officer	3	3.7
Nursing Officer	9	11.1
Pharmacist	1	1.2
Clinical Psychologist	1	1.2
Bachelor of Science (BSc)	7	8.6
Others	16	19.8
Total	81	100.0

From the above table, it emerged that majority of the respondents (46.9%) were Medical Doctors, followed by Nurses at (11.1%), Bachelor of Science (BSc) at (8.6%), and Public/Environmental Health Officers at (3.7%). Pharmacists and Clinical Psychologists accounted for (1.2%) each while 16 (19.8%) did not specify their professional qualifications. Other qualifications included Bachelor of Veterinary Medicine, Immunologist, Surgeon, Physiotherapist, Public Health Nutritionist and Civil Engineering as shown in table 4.5.

Table 4. 5 Professional Qualifications of the Respondents (Others)

Other Professional qualification	Frequency	Percent
B.V.M (Veterinary Surgeon)	3	3.7
Immunologist	2	2.5
Scientist	3	3.7
Physiotherapist	2	2.5
Public Health Nutritionist	1	1.2
Civil Engineering	1	1.2
Total	12	14.8

Other professional qualifications of the respondents observed presented a complex scenario and in this category, Bachelor of Veterinary Medicine (BVM) was and Pure Scientists were 3.7% each. Immunologist and Physiotherapist were 2.5%% while Public Health Nutritionist and Civil Engineering stood at 1.2% each.

4.3 Analysis Based on the Research Objectives

4.3.1 Objective One: Educators' Belief on Competence and Understanding of Innovative Medical Curriculum Planning and Development Process.

The study findings indicated that 88.9% of the medical educators perceived they had knowledge regarding innovative medical curriculum planning and development to some extent and therefore considered to be competent. However, 11.1% either indicated that they had the knowledge to least extent or were undecided as shown in table 4.6.

Table 4. 6 Knowledge and Understanding on Innovative Medical Curriculum Planning and Development as a Process.

Response	Frequency	Percent
To least extent	5	6.2
Undecided	4	4.9
To some extent/a great extent	72	88.9
Total	81	100.0

Regarding needs and Task analysis, findings revealed that that, a total of (75.3%) of the medical trainers were competent while (24.7%) were either unsure or incompetent observed in. 4.7.

Table 4.7 Competence in Performing Needs and Task Analysis

Response	Frequency	Percent
Totally Incompetent	1	1.2
Incompetent	1	1.2
Unsure	18	22.2
Competent/Highly competent	61	75.3
Total	81	100.0

Asked whether the current medical curricula actually was the right one to prepare students, a total of 81.5% were in agreement that it actually prepares the students for any eventuality though 19.8% of these strongly agreed as observed in table 4.8.

Table 4.8 Curriculum is the Right one to Prepare Programme Graduates

Response	Frequency	Percent
Strongly Disagree	3	3.7
Disagree	4	4.9
Undecided	8	9.9
Agree/Strongly Agree	66	81.5
Total	81	100.0

Regarding accomplishment of programme goals by the present curricula, 68 (84 %) agreed while 16% were unsure or disagreed as seen in table 4.9.

Table 4. 9 Current Curriculum is Accomplishing Programme Goals?

Response	Frequency	Percent
Strongly Disagree	1	1.2
Disagree	3	3.7
Unsure	8	9.9
Agree/Strongly Agree	68	84%
Non Response	1	1.2
Total	81	100.0

Findings indicated that (77.8%) of the educators were competent in development of programme goals while 22.2% perceived they were incompetent shown in table 4.10.

Table 4. 10 Competence in Identifying and Developing Programme Goals

Response	Frequency	Percent
Totally Incompetent	1	1.2
Unsure	15	18.5
Competent/Highly Competent	63	77.8
Non Response	2	2.5

Regarding innovative teaching strategies, study findings indicated that 69.1% were competent while 30.9% were either unsure or they were totally incompetent as seen from in table 4.11

Table 4. 11 Competence in Developing Innovative Teaching Strategies

Response	Frequency	Percent
Totally Incompetent	1	1.2
Incompetent	2	2.5
Unsure	14	17.3
Competent/Highly Competent	63	69.1
Non Response	1	1.2
Total	81	100.0

In terms of identifying key professional competencies for the purpose of innovative medical curriculum planning and development, 77.8% while 22.2% were incompetent as seen in table 4.12.

Table 4. 12 Identification of Key Professional Competencies

Response	Frequency	Percent
Totally Incompetent	1	1.2
Incompetent	1	1.2
Unsure	16	19.8
Competent/Highly Competent	63	77.8
Total	81	100.0

In terms of identifying and developing core contents, 71.6% indicated that they were competent while 28.4% perceived themselves as incompetent as observed from table 4.13.

Table 4. 13 Competence in Identifying and Developing Core Content

Response	Frequency	Percent
Incompetent	5	6.2
Non response	18	22.2
Competent/Highly Competent	58	71.6
Total	81	100.0

On development of learning objectives and learning outcomes, educators believed that, these could be developed competently as observed from the findings. A significantly high proportion of educators (96.3%) agreed that they could develop learning objectives and learning outcomes while 3.7% were either undecided or strongly disagreed as seen in table 4.14.

Table 4. 14 Competence in Developing Learning Objectives/Learning Outcomes

Response	Frequency	Percent
Strongly Disagree	1	1.2
Undecided	2	2.5
Agree/Strongly Agree	78	96.3
Total	81	100.0

Curriculum development incorporates the development of curriculum resources. The study sought to determine what lecturers perceived to be their competence innovativeness in developing curriculum resources. The proportion of those who felt that they were innovative and highly innovative were (64.2%). The remaining 35.8% indicated they are neutral, un-innovative, totally un-innovative and non-response.

Table 4. 15 Innovativeness in Developing Curriculum Resources

Response	Frequency	Percent
Totally Un-innovative	2	2.5
Un-innovative	6	7.4
Neutral	19	23.5
Innovative/Highly Innovative	52	64.2
Non Response	2	2.5
Total	81	100.0

Respondents were asked to indicate what they perceived to be their understanding and skills applications in developing learning materials. Those who perceived to have the knowledge understanding and skills in developing learning materials were 55.5%.

Those who were undecided, non-response, low or very low total to 44.5% as observed in table 4.16.

Table 4. 106 Knowledge, Understanding and Skills Application in Developing Learning Materials

Response	Frequency	Percent
Very low	1	1.2
Low	16	19.8
Undecided	17	21.0
High/Very high	45	55.5
Non-Response	2	2.5
Total	81	100.0

Competency of educators was further characterized by how well equipped they were in competency domains that concerns innovative medical curriculum planning and development.

In line with these essential domains, respondents were asked to indicate their perceived demonstration of competence in developing and at the same time, aligning these domains, making them feature and to occupy a key position for innovative medical curriculum. Findings revealed that a total of 62.4% were well equipped and had knowledge and understanding in inculcating values and leadership in the medical trainees and that they were able to make these domains feature prominently in an innovative medical curriculum making process.

Those who perceived themselves to lack competence stood at 37.6% and included, least equipped, non-response and not equipped as observed in table 4.17.

Table 4. 17
Equipment and Knowledge in Issues on Innovative Medical Curriculum Domains

Statement / Question		Not Equipped	Least equipped	Well Equipped	Highly Equipped	Non Response	Totals
Knowledge in developing and aligning professional values and leadership	N	2	9	38	26	6	81
	%	2.5	11.1	46.9	32.1	7.4	100
Knowledge and understanding in developing and aligning attitudes and compassion	N	1	11	38	25	6	81
	%	1.2	13.6	46.9	30.9	7.4	100
Knowledge in developing and alignment of Behaviours and Respect	N	1	11	42	21	6	81
	%	1.2	13.6	51.9	25.9	7.4	100
Knowledge and understanding in developing and aligning Ethical Stance and Cultural Context	N	0	9	37	29	6	81
	%	0	11.1	45.7	35.8	7.4	100
Knowledge and skills in developing and aligning Scientific Foundations of Medicine	N	0	9	36	29	7	81
	%	0	11.1	44.4	35.8	8.6	100
Knowledge and skills in developing and aligning Effective Communication skills	N	1	10	35	29	6	81
	%	1.2	12.3	43.2	35.8	7.4	100
Knowledge in developing and aligning Population Health and Health Systems	N	2	24	31	17	7	81
	%	2.5	29.6	38.3	21	8.6	100
Knowledge in developing and aligning Critical Clinical Skills	N	4	10	28	32	7	81
	%	4.9	12.3	34.6	39.5	8.6	100
Knowledge and skills in developing and aligning Management of Informatics	N	6	29	27	10	9	81
	%	7.4	35.8	33.3	12.3	11.1	100
Knowledge and skills in developing and aligning Critical Thinking and Research	N	6	29	27	10	9	81
	%	7.4	35.8	33.3	12.3	11.1	100
Mean	N (%)	2(2.5%)	14(17.6%)	34(42%)	23(28.4%)	7(8.6%)	80(99.1%)

Specific domains, behaviours and respect are other broad domains of the medical professions in which educators were asked to indicate their perception. In the study, a total 77.8% indicated that they perceived themselves as either well equipped or highly equipped in inculcating these behaviours for an innovative medical curriculum. Those who were not equipped, least equipped non response stood at 22.2%.

Concerning ethical stance and cultural context, the study findings indicated that 81.5% were well or highly equipped while 18.5% perceived themselves lacking in these competencies.

4.3.2 Objective Two: Educators' Views, Perceptions and Responses to Innovative Medical Curriculum Dynamics in the 21st Century, the SPICES Model.

The study investigated educator's views and perceptions on innovative medical curricular issues using SPICES model. The SPICES model as proposed by Harden (1984) has been used both as a framework for quality improvement in medical education and as a guide for evaluation of curricula. Respondents were asked to indicate where their faculty curricular was shifting to on extreme ends along a continuum of innovative versus traditional.

The six strategies of SPICES are representatives of innovative approaches to medical curriculum, and each one has been considered as a continuum. The study model based on SPICES Vs TIDHUA was used as a programme evaluation tool, through developing a conceptual shift model for each continuum of the six continuums.

4.3.2.1 Student Centred versus Teacher Centred Curriculum

In curriculum circles, it is said that a good innovative medical curriculum is one that is student centred, Shumway (2008). In the study there was a general trend, indicating a shift from a teacher centred curriculum to a student centred curriculum.

The evaluation of the medical curriculum by the medical educators indicated a skew towards student centred curriculum. There was adequate shift (32.6%) of the curriculum towards student centred as opposed to teacher centred 7.9%. The medical lecturers who felt that there was pure shift to student centred curriculum was 16.3% against 2.6% as observed in table 4.18.

Table 4. 18 Student Centered Versus Teacher Centered Curriculum

Response	Student Centred		Teacher Centred	
	Frequency	Percent	Frequency	Percent
Slight Shift	3	7	0	0
Some Shift	5	11.6	3	7.9
Fair Shift	8	18.6	1	2.6
Adequate Shift	14	32.6	3	7.9
Pure Shift	7	16.3	1	2.6
Neutral	6	14	30	37.0
Total	43 (53%)	100.0	38 (47%)	100.0

4.3.2.2 Problem based versus information gathering

Another continuum in which innovative medical curriculum is evaluated on is whether it is problem based or information gathering. Problem based or problem solving strategy is based on student acquisition of knowledge through process of clinical problem solving.

Information gathering is a strategy based on student presentation of gathered information or facts. In the study, educators indicated that their curricula was 29.5% problem based indicating that there is at least an adequate shift of the curriculum towards problem based as opposed to it being information gathering as seen in table 4.19.

Table 4. 19 Problem based versus Information gathering

Response	Problem based		Information gathering	
	Frequency	Percent	Frequency	Percent
Neutral	1	2.3	1	2.7
Slight Shift	3	6.8	1	2.7
Some Shift	3	6.8	1	2.7
Fair Shift	7	15.9	0	0
Adequate Shift	13	29.5	1	2.7
Pure Shift	12	27.3	2	5.4
Non response	5	11.4	31	38.3
Total	44 (54%)	100.0	37 (46%)	100.0

4.3.2.3 Integrated versus discipline based

The other important strategy of innovative medical curriculum is integration. This strategy is based on integration of different disciplines. Mostly integration is made around certain organ systems. Basic sciences, preclinical and clinical subjects are integrated around the organ systems that are being studied. The study findings indicated a shift towards an integrated system of curriculum. Fourteen (31.1%) of the medical lecturers indicated that there was a fair shift towards an integrated curriculum, while

those who indicated an adequate shift were ten (22.2%). Those who felt there was pure shift were 8 (17.8%). However, 31 (38.3%) did not respond as to whether the curriculum was discipline based or otherwise as observed in table 4.20.

Table 4. 20 Integrated Versus Discipline Based

Response	Integrated		Discipline based	
	Frequency	Percent	Frequency	Percent
Neutral	1	2.2	1	2.8
Slight Shift	3	6.7	1	2.8
Some Shift	5	11.1	0	0
Fair Shift	14	31.1	1	2.8
Adequate Shift	10	22.2	0	0
Pure Shift	8	17.8	2	5.6
Neutral/Non-response	4	8.9	31	38.3
Total	45 (56%)	100	36 (44%)	100.1

4.3.2.4 Community based versus hospital based

Pertaining as to whether their curricula are community or hospital based; the respondents indicated that the medical curriculum was community based. Those who indicated a fair shift were 9 (20.5%), adequate shift were 17 (38.6%) and pure shift were 7 (15.9%) towards community based. However, 39.5% opted not to respond and a total of 13.5% thought their curricula were shifting towards hospital based as shown in table 4.21.

Table 4. 21 Community Based Versus Hospital Based

Response	Community based		Hospital based	
	Frequency	Percent	Frequency	Percent
Neutral	3	6.8	0	0
Some Shift	4	9.1	2	5.4
Fair Shift	9	20.5	0	0
Adequate Shift	17	38.6	1	2.7
Pure Shift	7	15.9	2	5.4
Neutral /Non response	4	9.1	32	39.5
Total	44 (54.3%)	100.0	37 (45.7%)	100.0

4.3.2.5 Elective versus standard curriculum

It is envisioned that a good medical curriculum gives the medical student, the liberty to choose disciplines which interest them most. The study findings indicated that a higher proportion of the medical lecturers felt that their curriculum was not a standard one, rather it was an elective. There was adequate shift (39.5%) towards an elective medical curriculum. There were 16.3% of the medical educators who indicated to a pure shift, fair shift (2.3%), and slight shift (8.6%) as observed in table 4.22.

Table 4. 22 Elective Versus Uniform / Standard

Response	Elective		Standard	
	Frequency	Percent	Frequency	Percent
Neutral	2	4.7	1	2.6
Slight Shift	3	8.6	1	2.6
Some Shift	7	16.3	1	2.6
Fair Shift	1	2.3	0	0
Adequate Shift	17	39.5	1	2.6
Pure Shift	7	16.3	3	7.9
Non Response	6	14	31	38.3
Total	43	100.0	38	100.0

4.3.2.6 Systematic versus apprenticeship/opportunistic

For those who responded under this continuum, there was an indication of a shift towards systematic at 39.5% while the shift towards apprenticeship stood at 6.2% on the same scale. Those who opted to be neutral were 7.4%. However, there was 46.9% non-response as seen in table 4.23.

Table 4. 23 Systematic Versus Apprenticeship

Response	Systematic		Apprenticeship	
	Frequency	Percent	Frequency	Percent
Slight Shift	3	3.7	0	0
Some Shift	7	8.6	2	2.5
Fair Shift	5	6.2	2	2.5
Adequate Shift	9	11.1	0	0
Pure Shift	8	9.9	1	1.2
Total	32	39.5	5	6.2
Neutral/Non Response	6	7.4	38	46.9
Total	38	46.9%	43	53.1%
Sub Total				100

4.4 Perception on Innovative Assessment of Competence.

Knowledge of innovations in respect to development of assessment instruments to assess competence was determined. The study findings gave an indication that 90% of the medical lecturers perceived themselves as possessing competence in knowledge and understanding in developing innovative assessment instruments that can assess competence. However, 10% indicated incompetency as observed in table 4.24.

Table 4. 24 Knowledge in Developing Innovative Assessment of Competence

Response	Frequency	Percent
Least extent	3	3.7
Unsure	4	4.9
To some extent/great extent	73	90
Non Response	1	1.2
Total	81	100.0

4.4.1 Familiarity and Consistency in use of Innovative Assessment

Tools/Instruments

The study sought to establish familiarity and consistency in use of some of the innovative assessment tools/instruments. This was done on a five point-likert scale of: 0=Unfamiliar/Un-inconsistent, 1=Less Familiar/Consistent, 2=Familiar/Consistent, 3=Highly Familiar/Consistent. Some of the innovative assessment tools included Chartered Stimulated Recall Examination (CSRE), Capstone Projects (CP) Performance Audit Assessment (PAA), Essay/Modified Essay Questions (MEQ), Multiple Choice Questions (MCQ), Objective Structured Clinical Examination (OSCE), Patient Management Problems (PMP), Performance Based Assessment of Skills (PBAS), Portfolio/Diary Based Assessment (PBA), Short/Long Answer Questions (SAQ, LAQ), Standardized Oral/Viva/Patient Examination (SOE), True False Items Examination (T/F), Written Interactive Tests (WIT), Best Evidence-Based Assessment (BEBA), Course Embedded Assessment (CEA), and Computer Assisted Assessment (CAA).

The study findings indicated that a total of 49% of the lecturers perceived themselves as familiar, highly familiar or consistent in use of all the assessment instruments. There is a significant 51% who are either, unfamiliar and inconsistent in use and non-response.

On individual assessment instruments, the study revealed that of those who responded, 70.4% were familiar/consistent in MCQs while 66.7% could do the same for SAQ/LAQ and PBAS. Other familiar assessment tools used fairly included T/F and SOE at 51.9% each. 46.9% used MEQ, 43.2% used OSCE while 30.9% were consistently using PMP and WIT, respectively. The other assessment tools recorded below 20% in familiarity and consistency in their uses. They included Capstone Projects at 1.2%, CAA and CSRE at 3.7% each. PAA, 6.2% while PBA and BEBA were 8.6% each. CEA was 9.9% and WIT was 19.8% as observed from table 4.25. In this study, perceived familiarity was used to mean consistency in using assessment instruments while being unfamiliar implies inconsistent in using these assessment instruments.

Table 4. 25 Familiarity and Consistency in Use of Assessment Tools/Instruments

	Unfamiliar /Inconsistent		Less familiar /Consistent		Familiar / consistent		Highly Familiar/ Consistent		Non Response		Total	
Familiarity and consistency in use of (CSRE)	N	36		15		18		3		9		81
	%	44.4		18.5		22.2		3.7		11.1		100
Familiarity and consistency in use of Capstone Projects (CP)	N	48		16		6		1		10		81
	%	59.3		19.8		7.4		1.2		12.3		100
Familiarity and consistency in use of (PAA)	N	27		21		15		5		13		81
	%	33.3		25.9		18.5		6.2		16		100
Familiarity and consistency in use of (MEQ)	N	3		5		26		38		9		81
	%	3.7		6.2		32.1		46.9		11.1		100
Familiarity and consistency in use of (MCQ)	N	1		2		13		57		8		81
	%	1.2		2.5		16		70.4		9.9		100
Familiarity and consistency in use of (OSCE)	N	7		12		17		35		10		81
	%	8.6		14.8		21		43.2		12.3		100
Familiarity and consistency in use of (PMP)	N	7		13		26		25		10		81
	%	8.6		16		32.1		30.9		12.3		100
Familiarity and consistency in use of (PBAS)	N	1		3		15		54		8		81
	%	1.2		3.7		18.5		66.7		9.9		100
Familiarity and consistency in use of (PBA)	N	27		13		24		7		10		81
	%	33.3		16		29.6		8.6		12.3		100
Familiarity and consistency in use of (SAQ/LAQ)	N	1		3		15		54		8		81
	%	1.2		3.7		18.5		66.7		9.9		100
Familiarity and consistency in use of (SOE)	N	2		7		21		42		9		81
	%	2.5		8.6		25.9		51.9		11.1		100
Familiarity and consistency in use of (T/F)	N	2		7		21		42		9		81
	%	2.5		8.6		25.9		51.9		11.1		100
Familiarity and consistency in use of (WIT)	N	25		17		14		16		9		81
	%	30.9		21		17.3		19.8		11.1		100
Familiarity and consistency in use of (BEBA)	N	27		17		21		7		9		81
	%	33.3		21		25.9		8.6		11.1		100
Familiarity and consistency in use of (CEA)	N	32		16		17		8		8		81
	%	39.5		19.8		21		9.9		9.9		100
Familiarity and consistency in use of (CAA)	N	28		17		23		3		10		81
	%	34.6		21		28.4		3.7		12.3		100
Percentage Mean		17(21.3%)		12(14.2%)		18(22.5%)		22(27.4%)		9(11.5%)		80(99%)g

4.4.2 Role of educational climate in innovative medical curriculum

The role of educational climate/learning environment in innovative medical curriculum was also investigated. In the findings, 74.1% of the respondents indicated that they perceived themselves as having an understanding of the role of educational climate/learning environment in innovative medical curriculum. However, there were 25.9% of the respondents who either remained neutral, no understanding and non-response seen in table 4.26.

Table 4. 116 Role of Educational Climate in Innovative Medical Curriculum

Response from the lecturers	Frequency	Percent
No understanding	2	2.5
Neutral	18	22.2
Understand/Strongly understand	60	74
Non Response	1	1.2
Total	81	100.0

4.4.3 Perceived Competence in Implementation and Evaluation

Competence of educators with regard to innovative medical curriculum implementation and evaluation was also investigated. The percentage of medial educators who perceived themselves to be competent stood at 60 (74%) while 21 (26%) were either incompetent or undecided as seen from table 4.27.

Table 4. 27 Competence in Implementing and Evaluating an Innovative Medical Curriculum

Response	Frequency	Percent
Incompetent	5	6.2
Undecided	16	19.8
Competent/Highly competent	60	74
Total	81	100.0

4.4.4 Response to curriculum dynamics

As to whether educators can respond innovatively to curriculum dynamics, the research findings indicated that more than half of them believed that they could competently respond innovatively to curriculum dynamics. Fifty (61.7%) believed that they are competent enough to respond to curriculum dynamics. However (38.3%) opted to be either neutral, disbelieved, strongly disbelieved or no response as indicated in table 4.28.

Table 4. 28 Competency in Responding Innovatively to Curriculum Dynamics

Response	Frequency	Percent
Strongly Disbelieve	1	1.2
Disbelieve	2	2.5
Neutral	27	33.3
Believe/Strongly Believe	50	61.7
Non Response	1	1.2
Total	81	100.0

4.4.5 Adequacy of SPICES model curriculum in student assessment

The SPICES model curriculum theory as proposed by Harden (1984) was meant to among other things decide on what format the assessment strategy should take when evaluating medical

students as well as programme evaluation. Asked whether the SPICES model adequately addresses evaluation of students, the lecturers indicated that indeed it addressed evaluation of students which means that they were familiar with innovative assessment instruments on offer.

Findings indicate that 76.5% of the lecturers agreed that the SPICES model systematically and adequately addressed evaluation of medical students particularly under community based and elective strategy. However, 23.5% either were unsure, did not respond or disagreed, as depicted in table 4.29.

Table 4. 29 Adequacy of SPICES Model in Addressing Student Assessment

Response	Frequency	Percent
Disagree	2	2.5
Unsure	9	11.1
Agree	62	76.5
Non Response	8	9.9
Total	81	100.0

4.5 Objective Three: Role/Involvement of Faculty/Educators in Curriculum Making Process

Innovative competency based education and training has long been avoided by educators for lack of understanding, Calhoun *et al* (2004). Pertaining to the research findings in this study, the trainers were asked to specify the degree of their involvement in planning, designing, developing, implementing and evaluating a problem based learning (PBL) curriculum.

The study also sought to investigate and determine the role of the faculty and involvement in evaluating a PBL programme.

Findings indicated that 63.0% of the lecturers were involved often/quite often while a total of 37% were rarely involved, never and non-committal as shown in table 4.30.

Table 4. 30 Involvement and Role in Planning, Designing and Evaluating (PBL) Curriculum

Response	Frequency	Percent
Non-Committal	1	1.2
Never	6	7.4
Rarely	23	28.4
Often/Quite Often	51	63
Total	81	100.0

4.5.1 Effect of Educator's Competence in Innovative Medical Curriculum Making Process.

Lack of competence on curriculum development on the part of the medical educators is perceived to have significant effect on innovative medical curriculum making process. Research findings indicated that a total 87.6% of medical educators strongly perceived that lack of the educator's competence on curriculum development has a significant effect on innovative medical curriculum making process. The remaining 12.4% either disagreed, unsure or non-response as observed in table 4.31

Table 4. 31 Effect of Educators' Competence on Innovative Medical Curriculum Making Process

Response	Frequency	Percent
Disagree	1	1.2
Unsure	3	3.7
Agree/Strongly Agree	71	87.6
Non Response	6	7.4
Total	81	100.0

4.5.2 Competence * Curriculum Design Process Cross Tabulation

Basing on their past involvement on curriculum evaluation, respondents were asked to state whether lack of competence in curriculum planning and development has effect in innovative medical curriculum making process”. The competence of the medical lecturers comprised the independent variable while the curriculum design process comprised the dependent variable. Association between independent and dependent variable was established through a cross tabulation table.

On average, the competence of the lecturers was measured on a five point scale that consisted of, Highly Competent (5) Competent (4) Unsure (3) Incompetent (2) Totally Incompetent (1).

On the other hand the curriculum development process was measured on a four-point scale of, least extent (1), Unsure (2), some extent (3) and to a great extent (4). The results were coded, analysed and results generated a cross tabulation table 4.32.

Table 4. 32 Competence * Curriculum Design Process Cross Tabulation

		Curriculum Design Process					Total
		To least extent	Unsure	To some extent	To a great extent	Non Response	
Competence	Incompetent	0	1	0	0	0	1
	Unsure	2	2	4	0	0	8
	Competent	0	3	43	20	0	66
	Highly Competent	0	0	3	2	1	6

As observed from table the cell counts between the various categories indicate that 43(53%) of the medical lecturers competently agreed that competence has effect in innovative medical curriculum making a process.

CHAPTER FIVE

DISCUSSION

5.1 Introduction

This chapter discusses the findings of the study based on demographic information and the research objectives as developed from the research questions.

5.2 Discussion Based on Demographic Information

It was observed that 67.9% of the respondents were males while 32.1% were females. This means that there were more males than females who participated in this study, suggesting that males still dominate the profession within the institution. Findings in this study seem to be inconsistent with McKimm (2007) suggestion that institutions should aim to foster a climate in which a positive attitude to gender equality is actively promoted. Study findings also points to a young generation in that 84% were below 55 years while 16% were above 55 years. Judging from the findings of the study, it can be concluded that migration of staff out of this institution could be significantly consistent.

According to Groenhout (2012) the migration of skilled labour out of less developed countries is an acute problem in the medical sector. The most direct solution, to train more doctors and nurses, does not solve the problem because so many of those who are trained move to take advantage of higher salaries and an improved standard of living.

In terms of lecturing period, those between 11-20 years accounted for (35.8%). Only (4.9%) of the total respondents had served for between 21-30 years.

On professional qualification of the respondents, findings indicate that that educators at the College of Health Sciences were drawn from diverse professional backgrounds.

5.3 Discussion Based on Research Objectives

5.3.1 Discussion Based on Objective One: Educators' Competence and Understanding of Innovative Medical Curriculum Planning and Development Process

From the research findings, medical educators had the knowledge and understanding as pertains to innovative medical curriculum planning and development as a process to some extent and to a great extent as indicated by 88.9%. However, study findings revealed that 11.1% lack competence and therefore need to be trained.

Innovative curriculum development in medical education, according to Prideaux, (2003), is a scholarly process that integrates content area with educational theory, methodology and evaluates its impact. Curriculum process is procedural in the sense that its activities are performed in structured and definite steps. One of these steps is performing needs and task analysis. The study had sought to determine the competence of the trainers in performing this important step for an innovative medical curriculum.

Harden (2001) and Mutema *et al* (1992), in their ten steps approach to curriculum development, needs/task/problems was step one. Findings on this competency indicated that the medical trainers felt that they had the necessary competence to perform needs and task analysis for an innovative medical curriculum as indicated by 75.3% but 24.7% need training.

Provision of the right curriculum is crucial to service delivery as was pointed out by Patricia *et al*, (2004). Under this competency 81.5% perceived that the curriculum is the right one to prepare graduates since they form the team of educators, their high perception can create a positive impact on innovative medical curriculum making process. However 18.5% with low perception require some remedy because they impact negatively on curriculum implementation.

Harden and Davis (1995) had also advocated for core and options as one way of education for capability within an innovative medical curriculum. In line with this concept, results indicated the feeling that the current curriculum prepared programme graduates appropriately and to perform competently.

On accomplishment of programme goals, Gwee (2009) pointed out that for a successful curriculum planning and design to be achieved, curriculum planners must have the competence to identify and develop programme goals. Findings indicated that 84% of educators perceived that they were highly competent while significant 16% were not competent. Competence in teaching strategies is the ability to use special innovative teaching strategies and techniques in achieving realistic learning outcomes. According to Harden & Davis, (1995), the development and growth of competence depends on the teaching methods employed, the learning approaches of the students and facilities or resources within the institution, and all these combined, bring out a powerful results in knowledge delivery. Findings indicated that 69.1%% perceived they were competent against significant 30.9% who were incompetent.

These group of educators are highly essential and their incompetence in innovative teaching strategies can impact negatively in the implementation of curricula within their schools. On development of curriculum resources, the implication is that the proportions of the lecturers who were innovative were slightly higher than those who were not innovative. This was indicated by 64.2% who perceived themselves as being innovative against 35.8% who were incompetent. Developing curriculum resources or learning materials is crucial in innovative medical curriculum planning, development and implementation process according to McKimm (2007).

On competency domains, the implication is that at least a good proportion of the medical lecturers perceived they were well equipped and highly equipped 62.4% against 37.6% respectively. However, according to Shumway (2008), the outcome of this competency must be communicated to all the trainers, otherwise, it would be futile if it is not well manifested in the medical lecturers from the beginning. This idea partly forms the basis of the hidden curriculum that is the sole part that characterizes a medical lecturer (Roberts, 2004).

Aspects of competency domains included, but not limited, to the Institute for International Medical Education (IIME, 1999) that was given the task of providing leadership in defining domains considered being essential, and that every physician must have if he/she wishes to be called a physician. These cores of innovative medical curriculum “Essentials” were to consist of *medical knowledge, clinical skills, professional values, attitudes, behaviours and ethics* that all physicians must possess regardless of where they trained.

The teaching profession needs to have ethical stance and cultural context that is consistent with other professional domains essential to the practice of medicine. As IIME, (1999) had pointed out, this ought to be inculcated into the medical students who will practice in the course of their medical practice, which depend on mutual understanding and relationship between the doctor, the patient and the family with respect for patient's welfare, cultural diversity, beliefs and autonomy. Similar trends exist in domains of knowledge in developing and aligning scientific foundations of medicine, effective communication skills, population health and health systems, management of informatics and critical thinking and research

5.3.2 Discussion Based on Objective Two: Educators' Views, Perceptions and Responses to Innovative Medical Curriculum Dynamics in the 21st Century, the SPICES Model.

With reference to the specific pillars of the SPICES model, Harden (1984) the study had asked such questions as; is the curriculum student centred or teacher centred? Is the curriculum problem based or it entails information gathering? Is it integrated or discipline based? Is the curriculum community based or hospital based? Does the curriculum comprise elective medical unit courses or it is standard? And lastly, is the curriculum systematic or opportunistic/apprenticeship? And what is the shift like as specified in the questionnaire?

Findings indicated that the curricula at the College of Health Science, Moi University are student centred as perceived by 53% of educators. However, 47% indicated that the curricula were teacher centred, indicating a clear demonstration that these group could have a significant negative impact on curriculum delivery.

However, the trend seemed consistent with Shumway (2008) suggestion that innovative and competency-based medical education should, among other characteristics emphasize personal development of health care provider as a professional. The implication is that the curriculum ought to be student centred rather than teacher centred. Research finding casts some doubts because of the huge non-responses by the respondents at 37%. This significant figure could impact negatively on innovative medical curriculum development, implementation and evaluation as a process. It is not clear whether they were not sure of the medical curriculum under implementation or whether it was student centred or teacher centred. Medical lecturers felt that the medical curriculum they were implementing was more of problem solving based than a mere presentation of information gathered by students.

The fourteen (31.1%) of the medical lecturers who perceived that there is a fair shift towards an integrated curriculum, seemed to suggest that the findings somewhat concurs with Harden's (1986) suggestion, that a strategy based on teacher decisions on what, when and how certain subjects or courses will be studied will dictate whether a curriculum is integrated or discipline based.

Since the findings gave an indication that their curricula were 54.3% community based and 45.7% hospital based, the findings concurs well with Cooke (2006), who observed that previous studies indicate that cognitive psychology has demonstrated that facts and concepts are best recalled and put into service when they are taught, practiced, and assessed in the context in which they will be used as established.

Under the pillar of elective vs standard, there was 43% who indicated a shift towards elective and 38% who indicated a shift towards standard. In elective strategy, studying process is organized in a way that all students have the same core curriculum while they choose certain aspects which they wish to study more deeply through elective courses. In a standard curriculum, all students have the same curriculum without a possibility to choose elective courses. Therefore, this implies that the medical curriculum at the university is shifting towards medical reforms in the 21st century. However, as Majumder *et al* (2004) perception is that “Teachers of health professional education need to be well-informed of the trends and innovations and to utilize these to increase relevance and quality of medical education to produce competent human resource”. The results of the study findings imply that, while the medical curriculum is systematic at 39.5 % the issue is further negated by 7.4% and 46.9% neutral and non-response, respectively.

An innovative medical curriculum ought to embrace systematic as opposed to apprenticeship/opportunistic approaches to the teaching of a medical curriculum, Harden *et al*, (1984). It is proper for a medical lecturer to plan to teach, but bringing on board any practical knowledge that will enrich learning of the medical students. The curriculum seems to be systematic as far as its teaching is concerned, that is, a skill instruction to a trainee should meticulously move from one known activity to the other.

Cooke *et al*, (2006) did emphasize the importance of assessment that gives priority to the assessment of competence. Findings under this competency indicated that 90% of the educators perceived themselves as competent in developing assessment instruments for assessing competence. Only 10% perceive themselves as lacking the competency.

The implication here is that lecturers devote their time to quality delivery of a progressive and dynamic innovative medical curriculum, an observation capturing Abrahamson, (1978) on a healthy curriculum that responds to the needs of the society being served.

Findings were similar with recommendations by Dewey *et al*, (2005) on research report that innovative approaches to teaching, progressive skills instruction, assessment, and support of development of professionalism require teachers, who have the time to observe, instruct, coach, and assess their students and who also have time for self-reflection and their own professional development. The implication is that medical educators are competent and innovative as far as selected assessment strategies under innovative medical curriculum is concerned. Therefore, medical educators can continuously reconfigure themselves in response to changing scientific, social and economic circumstances.

The study findings under this competency indicated that educators' familiarity and consistency in development and use of innovative assessment tools were 49.9%. This means more than 50% of the educators perceived themselves as incompetent in development and use of assessment strategies for innovative medical curriculum planning and development, threatening the assessment of clinical competence and creating negative impact. With regard to educational climate that should be fostered, Harden (1984), in his SPICES model stressed that it was necessary to make a plan to maximize the impact of the curriculum, including content, educational strategies and educational climate congruent with the objectives. In this study, (74.1%) of the respondents perceived that they understood the role of educational climate/learning environment in innovative medical curriculum,

The implication is that educators at Moi University, College of Health Sciences are competent on issues related to the role of educational climate in an innovative medical curriculum. Specifically, Harden (1984) had indicated the kind of educational environment and climate that should be fostered or developed so that teaching is effectively enhanced. However, 25.9% seemed to have low understanding regarding the role of educational climate in educational setting, a feature similar to findings as perceived by Standa *et al*, (2000).

Standa *et al* (2000) while investigating the root causes of student disturbances, riots and terrorisms in Kenyan Public Universities, established that inadequate resources and educational climate were some of the major contributing factors. This confirms the importance of the educational climate because; it may not only cause ineffective teaching but can also cause riots, and that lecturers can competently address these challenges.

The concept of competence as defined by ACGME (2001) is the aptitude to carry out a task or job position effectively, on account of possessing competencies required for the task, depending upon the mastery of a complex body of knowledge and skills. Findings under this competency indicated that 74% perceived themselves as competent in the tasks of programme implementation and evaluation for an innovative medical curriculum while 26% perceived themselves as incompetent.

Implementation is an interaction between those who have created the programme and those who are charged with delivering it, according to Ornstein and Hunkins, (1998). On the other hand, if a curriculum plan is not implemented and remains on the shelf then all efforts in planning will be a sheer waste.

A curriculum must be delivered, meaning, it must be implemented if it is to make an impact on student learning. In some curriculum development projects, implementation has not been given due consideration though innovations need careful planning and monitoring, Ornstein and Hunkins, (1998). In respect to curriculum dynamics, findings indicated that 61.7% believed they were competent in this competency, implying that educators could respond appropriately to curriculum dynamics.

However, significant 38.3% indicated that they were incompetent, suggesting they could impact negatively on innovative medical curriculum planning and development. According to Gwee, (2009) curriculum dynamics arose from changing health care needs of the society. These issues range from managed care and a multicultural society, to palm top computers and medical informatics, the genetic code and harsh realities of public health that include domestic violence, effects of homelessness and AIDS, to learning new ways to enhance health care quality, while minimizing medical mistakes. This also implies that, medical lecturers are able to respond to curriculum dynamics in the course of their being tasked to do so.

Educators seemed to concur with Harden *et al*, (1999) description of innovative outcome-based education as a way of developing competence, and an innovative medical curriculum strategy, where emphasis is on the product, rather than on educational process. In outcome-based medical education the educational outcomes are clearly and unambiguously specified.

A total of 76.5% of the respondents agreed that the SPICES model of curriculum offers a range of innovative options for student assessment as proposed by Tabish, (2008).

This implies that the SPICES model remains the most innovative and influential educational theory of innovative medical curriculum design in modern times as proposed by Harden (1984). However, significant 23.5% of medical educators perceived themselves as incompetent in stating that SPICES model of curriculum does address student assessment adequately. SPICES model has highlighted a move away from teaching with a hospital based and didactic curriculum content to a more well-directed learning utilizing all available health learning opportunities but underpinned by systematic curriculum content approaches as it offers assessment opportunities under the six pillars of the SPICES model.

5.3.3 Discussion Based on Objective Three: Role/Involvement of Faculty/Educators in Curriculum Making Process

Findings in this study indicated that a few, slightly more than half of the lecturers had been involved in innovative medical curriculum development as a process. The implication is that there is evidence of involvement of faculty and medical educators in a PBL curriculum planning and development process in the institution.

These means that 63% have been involved in innovative curriculum evaluation. However, there is a significant 37% non-involvement, results contrary to Wood's (2003) suggestion that all teachers ought to be involved in curriculum issues. Introduced in the 1960s, problem-based learning replaces traditional passive biomedical knowledge transfer (lectures, readings) with a quasi-experiential method of acquiring basic biomedical concepts (Wood, 2003).

In this problem-based approach, written cases rather than living patients serve as triggers for the definition of students' learning goals and for independent self-directed learning, which is then refined in small group discussions under coaching by faculty educators, (Nandi *et al.*, 2000). In similarity to these findings, Kincasde, (2005); in his research report maintains that; one of the important reasons why medical educator's participation is of a particular value in continuous curriculum evaluation lies with fact that in his daily involvement, with the teaching, the educator is conversant with the needs of the student.

One of the roles of medical educators in planning and design of curriculum is continually performing needs and task analysis. This is one of the steps in the curriculum development process as suggested by Mutema *et al*, (1992). The other role is to evaluate the curriculum being implemented, attempting to answer some questions such as; is the institutional curriculum what is needed to prepare the students for real life practice?, is the curriculum still relevant, worth or carrying any impact?, If it is not the case, then urgent measures and review could be needed.

The next role of the lecturers is setting programme goals both for the course and the institution. The lecturers need to set overall goals and aims for the curriculum by writing them down with clarity and unambiguous. This is done in line with specifics of being measurable in knowledge, skill/performance, attitudes, and to reflect course objectives. There was a general consensus that lack of competence in curriculum development has effect on innovative medical curriculum making process. This is indicated by 61.7% with high perception against 38.3% of low perception.

CHAPTER SIX

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

This chapter presents a summary of the study findings, conclusions, recommendations and suggestions for further research based on the analysis of data. This is in relation to the purpose of the study which was, to determine the competency of medical educators in innovative medical curriculum planning and development. To carry out this study, a survey research design was used, where questionnaires were administered to all lecturers in the College of Health Science. This chapter is divided into four sections. The first section presents a summary of the research findings, the second part presents conclusions, and the third contains recommendations and lastly suggestions for further research.

6.2 Summary of the Findings

The study findings agree with the study by Shumway (2008) which found that despite increasing demands for new curricula in medical education, most academic medical institutions have few faculty educators with training in innovative curriculum planning and development. Findings also have a bearing in terms of participation by gender in that medical education appears to be a male dominated profession at 67.9% male and 32.1% female. Research by McKimm (2007) into the position of women in science and engineering indicated that for many women, educational climate is 'chilly' and comparably few women progress into senior positions. These include tackling the problems of differential expectations and the long-term effects of prejudice and stereotyping.

In other professions, the study found that women are clustered in lower career positions at the bottom of the pyramid, whereas majority of senior positions in clinical and in academic medicine are held by men, a conclusion consistent with the findings of this study. The findings seem to be consistent with medical migration of skilled labour as described by Groenhout (2012) which states that Medical migration of skilled labour out of less developed countries is causing acute problem in the medical sector.

The presence of this condition suggests that the provider nation is at risk of depleting its natural supply of intellectual and competent academic talent. Global migration of physicians, nurses and other health professionals, produce serious shortages in the developing world. The reduction in stock of such scarce personnel is bound to put severe strain on their colleagues and the institution causing negative impact on competency development.

Study findings seem to indicate that there was a likelihood of a situation where a curriculum in trouble could easily set up as indicated by Abrahamson (1978), and supported by Pinto (2008). Abrahamson (1978) had stated that, “a curriculum that does not change; a curriculum that is unchanging in response to developing needs of the society is a curriculum in trouble”.

Regarding professional qualifications held by educators, the diversity includes Medical Doctor, Dental Doctor, Public/Environmental Health Officer, Nursing Officer, Pharmacist, Clinical Psychologist, Bachelor of Science (BSc) among others. The findings revealed a higher proportion of medical doctors as compared to other disciplines.

Others which represent a complex mix of professionals included Bachelor of Veterinary Medicine, Civil Engineering, Immunologist, Physiotherapist and Public Health Nutritionist. Still, there are a large proportion of educators, as revealed by the research findings who displayed discrepancies in competencies required of an innovative medical curriculum development. For the first objective of the study which was to investigate educator's competence and understanding of curriculum planning and development as a process, it was evident that a significant proportion of medical educators had the necessary knowledge on innovative medical curriculum to some extent as opposed to those who had knowledge to a great extent. Patricia *et al* (2004), had stated that, identification and critical analysis of the health care problems that will be addressed by the innovative curricula requires substantial research to analyze what is currently being done by practitioners and educators.

Involvement of educators in planning and designing curricula, particularly Problem Based Learning (PBL) was irregular, since slightly more than half were involved in curriculum planning and design. A significant proportion were rarely involved, giving the impression of a static curriculum that does not change in response to the needs of the society it serves.

However, Rosenbaum (2005) had suggested that medical educators play crucial role in innovative medical curriculum planning and development as a process. Harden (2001) emphasized that for a successful curriculum planning and design, curriculum planners must have the competence to identify and develop programme goals.

According to Harden & Davis, (1995), the development and growth of competence for identifying programme goals depends on the teaching methods employed, the learning approaches of the students and facilities or resources within the institution. All these when combined, brings out a powerful result in knowledge delivery

On identification and development of core content for an innovative medical curriculum, there was an indication that some were highly competent though significant proportion they were incompetent. More than half of the respondents strongly believed that they could competently write measurable learning objectives and learning outcomes. However, Frenk *et al*, (2010), had stated that while new challenges had resulted in an increased sense of urgency to improve the knowledge base and response capability of physicians, educators and students on professional competence, few medical schools and residency programmes had new and innovative curricula in place to teach these concepts, a sentiment which was consistent with the findings of the study.

On curriculum resources, competence of the lecturers' in innovativeness revealed that only a small proportion were highly innovative. Findings indicated that educators do not understand the difference between learning materials and curriculum resources because findings were not consistent. When asked to rate their competence on knowledge understanding and skills in developing learning materials, a small proportion were highly competent. The results signify observations by Jallow (2011) who had stated that despite vast advances in biomedical research and technology, the medical school curriculum has remained static for the past half a century.

However, a selected group of medical schools have begun to implement innovative curricular based on new methods of physician training and technologies for learning that integrate basic science with clinical medicine that include Patient-Based Learning, Organ Modules, Computer Simulation of Procedures and E-Learning. The implementation of innovative curricular seeks to conform to the prescriptions of resource developments for curriculum innovations as outlined in Tomorrow's Doctors as mandated by the General Medical Council (GMC, 2003).

Competency of educators were further characterised by how well equipped they are in competency domains as developed by IIME (2006). The concept of Global Minimum Essential Requirements (GMER) defined a set of global minimum learning outcomes which students of medical schools must demonstrate upon graduation. These cores of medical curriculum "essentials" included medical knowledge, clinical skills, professional attitudes, behaviours and ethics that all physicians must possess regardless of where they trained.

Aspects of domains were to include professional values and leadership domain, ability to develop attitude and compassion, development of behaviour and respect, ethical stance and cultural contexts, scientific foundation of medicine, effective communication skills, population health and health systems, critical clinical skills, management of informatics and critical thinking and research. Research findings revealed that educators were well equipped in all domains except population health and health systems. For management of informatics and critical thinking and research, significant proportion, were equipped.

Behaviour and respect are broad domains of the medical profession and half of the medical lecturers were at least well equipped in aligning inculcating these domains. This left significant proportions that did not possess the knowledge and understanding on these domains.

The medical profession needs to have an ethical stance and cultural context that is consistent with other professional essentials. According to ACGME (1999) this ought to be inculcated into the medical students who will practice this in the course of their medical practice, which depends on mutual understanding and relationship between the doctor, the patient and the family with respect for patient's welfare, cultural diversity, beliefs and autonomy. Similar trends of the findings were noticed as the medical essentials already discussed above as is the knowledge in developing scientific foundations of medicine, effective communication skills, population health and health systems, management of informatics and critical thinking and research. There was an exception with knowledge and understanding on developing critical clinical skills, where the medical lecturers had a high level of competencies. Lack of educator's competence in innovative curriculum development skills has been shown to have significant effect on curriculum making process.

In the objective two, the focus of SPICES/TIDHUA model as proposed by Harden (1984), the institution is offering a Problem Based Learning (PBL) within the SPICES model curriculum. The acronym SPICES refers to six main concepts in medical education commonly referred to as the Six Cornerstones in teaching medical students today. These are student centred teaching, problem based learning, an integrated curriculum, community based teaching, electives with a core, and the use of systematic methods.

An awareness of these principles means that medical students can take a more active role in their learning. Students who are well informed about medical education principles, such as the SPICES criteria, are more likely to be able to provide constructive feedback about their own medical education experience, contributing in the long term to course improvements.

However, faculties are not fully articulating those aspects of the model as indicated by the fact that pure shift is only 19.1% towards SPICES. However, curricula at the College of Health Sciences, Moi University is student centred as indicated by the fact that adequate shift towards SPICES was more than towards teacher centred. There is strong evidence of faculty and, hence, educators involvement in planning and designing PBL curriculum quite often. The study, however, was confronted by large number of educators who were non responsive which stood at a percentage of 37%. This was evident when educators were asked to evaluate their curricula using SPICES model. This cast some doubts on educator's perceived competence in knowledge and understanding of the curriculum strategy under implementation.

There was indication that educators were able to foster a favourable educational climate in the medical institution since they indicated that they strongly understood its role in innovative medical curriculum planning and development. Programme evaluation according to Mutema *et al*, (2000) presents the final stage inside cyclic process of improvement and development of curriculum. Without evaluation procedure, it would be hard to imagine monitoring of institution progress toward desired needs. This process is necessary to provide the evidences that institution made a step in the right direction, as well as useful information to stakeholders.

Dewey *et al* (2005) made recommendations that innovative approaches to teaching, progressive skills instruction, assessment, and support of development of professionalism require teachers, who have the time to observe, instruct, coach, and assess their students and who also had time for self-reflection and their own professional development.

As a follow up to SPICES model on innovative teaching strategies, lecturers were asked to state how competently they understand and can apply innovative strategies in teaching. The study findings indicated educators perceived themselves as competent although there were some who were unsure.

This is a confirmation of educators' perceived competence in understanding and application of innovative teaching strategies within the curricula under implementation in the College of Health Sciences, Moi University. Findings revealed that respondents believed they possessed the competence to respond innovatively to curriculum dynamics as specified by Gwee (2009). Dynamics are issues related to educator's responses to global changes, involvement in curriculum development, motivation, competence, willingness and ability to participate in an innovative and dynamic curriculum making process.

For an innovative medical curriculum to be successfully developed, educators ought to possess and demonstrate high degree of competence in knowledge and understanding of curriculum planning and development.

6.3 Conclusions

Pertaining objective one, the conclusion on demographics is that, the professionals are well educated, bringing together several professions capable of planning and designing innovative medical curricula despite the fact the field is male dominated.

From objective one 88.9% of the respondents perceived themselves as possessing knowledge and understanding in innovative medical curriculum planning and development as a process. However, 11.1% of the respondents perceived themselves as lacking this competency indicating that, attention is needed in form of training.

In terms of identifying and developing core contents, 71.6% perceive themselves as competent while 28.4% perceived themselves as incompetent. The following areas of competence were perceived to depict deficiency in innovative medical curriculum making process. On needs assessment was 75.3% perceived high against 24.7% perceived low, on teaching strategies, 69.1% was perceived as high while 30.9% was perceived low. On learning resources, 64.2% perceived themselves as competent while on competency domains, 62.4% perceived themselves as competent. It is clear that, there were 35.8% of medical educators who perceived they were incompetent and 37.6% who were incompetent in competency domains.

On objective two, it was clear that curricula at all the Schools within the College of Health Sciences were student centred at 53%. However, the 47% who perceived their curricula was teacher centred need education on SPICES model type of curriculum.

Other aspects were that, 76.5% perceived that the SPICES model type of curriculum address student assessment adequately, as opposed to 23.5% who were not. On familiarity of assessment instruments, 49.1% indicated they were familiar and 50.1% were not familiar.

Regarding educational climate and curriculum implementation, 74% perceived they were competent despite there were 24% who indicated that they were not implying the gap requires remedy. At the same time, 61.7% of educators indicated that they perceived themselves as competent in responding to innovative curriculum dynamics, although 38.3% declined to state their perceptions.

On objective three, 63% indicated that they have been involved or participated in curriculum evaluation within the institution, leaving out 37%. This percentage may impact negatively on the delivery of the curricula under implementation.

In view of critical thinking in relation with this research, findings of the study were relevant and useful among faculty/educators on processes of innovative medical curriculum planning, designing, development and change as the College of Health Sciences develop criteria under which curriculum reforms may be judged and improved.

On policy implication, the institution can use the findings to reconfigure itself on the need for change and the process of change to guide the college in the change process and improve the chances of achieving long-lasting and well-accepted curriculum innovations.

6.4 Recommendations

Given the objectives of the study, recommendations in this study were useful when bringing about change in curriculum development, implementation and evaluation/review. This will improve the medical curriculum under implementation within the faculty. From the findings of this study, on demographics, as recommended from the research by McKimm (2007) into the position of women in science and engineering indicated that for many women, educational climate is 'chilly'. Therefore, all efforts need to be put in place to encourage women to venture into this area of medical education.

From objective one, nearly 89% perceived themselves as possessing knowledge and understanding in innovative medical curriculum planning and development as a process, leaving out 11%. This percentage needs to be reduced to zero for an innovative medical curriculum school. In order to deal with this problem, regular professional seminars, workshops and conferences on innovative medical curricula should be undertaken.

Only 61% perceived themselves as strongly responsive to curriculum dynamics. The recommendation here is that all medical educators should be involved in curriculum development activities as much as possible.

On objective two, regarding the SPICES model, 53% indicated they perceived their curricula to student centred. In order to address this issue medical educators need regular professional seminars or conferences where all matters of innovative medical curricula including benefits over traditional are discussed, resolutions made and implemented,

For objective three Involvement in planning, designing and evaluating innovative Curriculum was indicated as 63%. In order to increase this percentage, members of staff need to be encouraged to attend seminars workshops and conferences.

Educators need to be motivated to devote more time for participation in innovative medical curriculum making processes within the institution. In addition, colleges and universities should sponsor their staff to continuing professional development courses.

6.5 Suggestions for Further Research

1. Research should be conducted as a follow up to this study to determine health professional's actual competence in innovative medical curriculum writing
2. A study should be conducted to determine whether migration of experienced educators, has an effect on curriculum implementation or whether it is associated with some other factors.
3. A study should be conducted to determine whether educator's incompetence in knowledge and understanding of SPICES model and assessment instruments has an effect on training and assessment of medical students.
4. Another similar research should be conducted by other independent researchers to establish validity and reliability of these findings.

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APPENDICES

Appendix I: Research Questionnaire

Section A; Personal Information

1. State your gender 1. Male () 2. Female ().
2. State your age by ticking in the appropriate box;
 1. 21-35 years (). 2. 36-45 years (). 3. 46-55 years (). 4. 56-65 years (). 5. 66-75 years.
3. For how long have you been lecturing at Moi University?
 1. Less than 10 years (). 2. 11-20 years (). 3. 21-30 years (). 4. Over 30 years ().
4. State your professional qualification
 1. Medical Doctor ()
 2. Dental Doctor ()
 3. Public/Environmental Health Officer ()
 4. Nursing Officer ()
 5. Pharmacist ()
 6. Clinical Psychologist ()
 7. Bachelors of Science ()
 8. Others (Specify)
5. Highest level of qualification
 1. 1st Degree (Bachelors) () Specify for example MBChB.....
 2. 2nd Degree (Masters) () Specialisation for example.....
 3. 3rd Degree (Doctorate) (s) Specialisation.....
 - Other Titles; 4. Associate Professor (). 5. Professor (). 6. Consultant ().
 7. Others (Specify).....

Section B; Questions on Innovative Medical Curriculum Competence.

1. In your opinion, to what extent do you think you possess competence in knowledge, understanding the meaning of *Innovative Medical Curriculum Planning and Development*?

1. Great extent () 2. Some extent () 3. Undecided () 4. Least extent () 5. No knowledge ()

2. How *competently high* do you think you can perform needs and task analysis in innovative medical curriculum planning and development for your Institution?

1. Highly Competent () 2. Competent () 3. Unsure () 4. Incompetent () 5. Totally Incompetent ()

3. How *strongly do you agree* that the institution's current curriculum is what it needs to be to *prepare* those who will be practicing medicine and pursuing curriculum innovations in biosciences and life-long learning into the 21st century?

1. Strongly Agree () 2. Agree () 3. Undecided () 4. Disagree () 5. Strongly Disagree ().

4. In your view, how strongly do you agree that the current curricular, are *accomplishing* the programme goals for your institution?

1. Strongly Agree () 2. Agree () 3. Unsure () 4. Disagree () 5. Strongly Disagree ().

5. *How often do you or have you been involved* in planning, designing, developing, implementing and evaluating/review of Innovative Problem-Based Learning (PBL) Curriculum being followed in this institution?

1. Quite often () 2. Often () 3. Rarely () 4. Never () 5. Non-Committal ()

6. In your opinion, how competent are the Educators in *identifying and developing Program Goals, Competencies and Learning objectives* in an innovative medical curriculum planning and development?

1. Highly competent () 2. Competent () 3. Unsure () 4. Incompetent () 5. Totally Incompetent ()

7. How do you *rate your competence in skills'* application of following steps while developing an innovative medical curriculum?

1. Highly competent () 2. Competent () 3. Unsure () 4. Incompetent () 5. Totally Incompetent ().

8. In your perception, how **competent** are you in **Identifying key Professional Competencies** for an innovative medical curriculum in your School?

1. Highly competent () 2. Competent () 3. Unsure () 4. Incompetent () 5. Totally Incompetent ()

9. How **competent** do you think the lecturers are in **Identifying and Developing Core Content** for an Innovative medical curriculum in this institution?

1. Highly Competent () 2. Competent () 3. Unsure () 4. Incompetent () 5. Totally Incompetent ()

10. How strongly do you agree that **Learning Objectives/Learning Outcomes** can be developed by educators for an innovative medical curriculum planning and development?

1. Strongly Agree () 2. Agree () 3. Undecided () 4. Disagree () 5. Strongly Disagree ()

11. In your opinion, **how Innovative** are the educators in developing **Curriculum Resources** for an innovative curriculum planning and development?

1. Highly Innovative () 2. Innovative () 3. Neutral () 4. Un-innovative () 5. Totally Un-innovative ()

12. What **level of competence** do you think you possess knowledge, understanding and skills in **developing Learning materials** for an innovative medical curriculum planning and development?

1. Very High () 2. High () 3. Undecided () 4. Low () 5. Very Low ()

13. **Evaluate your School Curriculum** using **SPICES** vs. **TIDHUA** model by circling the number you competently perceive to **Shift Towards** in either way along the **continuum** provided using the following likert scale;

0=Neutral, 1=Slight Shift, 2=Some Shift, 3=Fair Shift, 4=Adequate Shift, 5=Pure Shift.

S	Student centred	5 4 3 2 1 0	Vs	0 1 2 3 4 5	Teacher centred	T
P	Problem based	5 4 3 2 1 0	Vs	0 1 2 3 4 5	Information gathering	I
I	Integrated	5 4 3 2 1 0	Vs	0 1 2 3 4 5	Discipline based	D
C	Community based	5 4 3 2 1 0	Vs	0 1 2 3 4 5	Hospital based	H
E	Elective	5 4 3 2 1 0	Vs	0 1 2 3 4 5	Uniform/Standard	U
S	Systematic	5 4 3 2 1 0	Vs	0 1 2 3 4 5	Apprenticeship	A

14. How strongly do you **believe** lecturers understand and can use *innovative Teaching/Learning Strategies* in an innovative medical curriculum, the SPICES model above?

1. Strongly belief () 2. Belief () 3. Neutral () 4. Disbelief () 5. Strongly Disbelief ()

15. In your opinion, *to what extent* do you think you possess knowledge, understanding and skills in developing innovative *Assessment Instruments/test items* that can assess *Competence in knowledge, skills and attitudes from Low to High Level*?

1. To a great extent () 2. To some extent () 3. Unsure () 4. Least extent ()

16. How strongly do you think you *understand the role of Educational Climate/Learning Environment* in innovative curriculum planning and development?

1. Strongly Understand () 2. Understand () 3. Neutral () 4. No Understanding ()

17. In your opinion, what is your *competence* in *Implementing and Evaluating* Innovative medical curriculum after development?

1. Highly Competent () 2. Competent () 3. Undecided () 4. Incompetent ()

18. How strongly do you **believe** that Educators can competently respond innovatively to curriculum dynamics, reforms and revolutions in this institution for the purpose of curriculum planning and development?

1. Strongly Belief () 2. Belief () 3. Neutral () 4. Disbelief () 5. Strongly Disbelief ()

19. How **Equipped** are you with knowledge and skills in **developing** the listed **Essential Competency Domains**, and make them *feature and occupy a key position* in an Innovative medical curriculum planning and development. Use the likert scale;

0=Not Equipped, 1=Least Equipped, 2=Well Equipped, 3=Highly Equipped

S/No	Competency Domain/Attributes	0	1	2	3
1	Professional Values and Leadership				
2	Attitudes and Compassion				
3	Behaviours and Respect				
4	Ethical Stance and Cultural Context				
5	Scientific Foundations of Medicine				
6	Effective Communication Skills				
7	Population Health and Health Systems				
8	Critical Clinical Skills				
9	Management of Informatics				
10	Critical Thinking and Research				

20. Indicate your familiarity and consistency in use of these innovative assessment tools/instruments and use the Likert scale; 0=Unfamiliar/Un-inconsistent, 1=Less Familiar/Consistent, 2=Familiar/Consistent, 3=Highly Familiar/Consistent

No	Assessment Tool/Instrument	0	1	2	3
1	Chartered Stimulated Recall Examination (CSRE)				
2	Capstone Projects (CP)				
3	Performance Audit Assessment (PAA)				
4	Essay/Modified Essay Questions (MEQ)				
5	Multiple Choice Questions (MCQ)				
6	Objective Structured Clinical Examination (OSCE)				
7	Patient Management Problems (PMP)				
8	Performance Based Assessment of Skills (PBAS)				
9	Portfolio/Diary Based Assessment (PBA)				

10	Short/Long Answer Questions (SAQ, LAQ)				
11	Standardized Oral/Viva/Patient Examination (SOE)				
12	True False Items Examination (T/F)				
13	Written Interactive Tests (WIT)				
14	Best Evidence-Based Assessment (BEBA)				
15	Course Embedded Assessment (CEA)				
16	Computer Assisted Assessment (CAA)				

21. How strongly do you agree that, *Lack of Educators' Competence in curriculum making process has significant effect in planning, designing, developing, implementing and evaluating an innovative medical curriculum?*

1. Strongly Agree () 2. Agree () 3. Unsure () 4. Disagree () 5. Strongly Disagree ().

Appendix II: IREC Approval Letter



MOI TEACHING AND REFERRAL HOSPITAL
P.O. BOX 3
ELDORET
Tel: 334711/2/3



INSTITUTIONAL RESEARCH AND ETHICS COMMITTEE (IREC)

MOI UNIVERSITY
SCHOOL OF MEDICINE
P.O. BOX 4606
ELDORET
Tel: 33471/2/3
12th March, 2013

Reference: IREC/2012/38

Approval Number: 000948

Harun Chemjor Chepkeitany,
Moi University,
School of Medicine,
P.O. Box 4606-30100,
ELDORET-KENYA.

Dear Mr. Chemjor,

RE: FORMAL APPROVAL

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

“Competency of Medical Educators in Innovative Medical Curriculum Planning and Development in Kenya: A Case of Moi University, College of Health Sciences.”

Your proposal has been granted a Formal Approval Number: **FAN: IREC 000948** on 12th March, 2013. You are therefore permitted to begin your investigations.

Note that this approval is for 1 year; it will thus expire on 13th March, 2014. 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
Principal - CHS
Dean - SOM
Dean - SPH
Dean - SOD
Dean - SON



Appendix III: College Approval Letter



MOI UNIVERSITY
COLLEGE OF HEALTH SCIENCES
Office of the Principal

Medical Education Centre Building
 Nandi Road, Opp. MTRH
 P O Box 4606, 30100
 Eldoret, KENYA

Tel: 254(0) 53-2060958/9
 254(0) 53-2033103-231
 254(0) 53-2033242
 Fax: 254(0) 53-2033234
 E-mail: principalchs@mu.ac.ke
 mupchs@gmail.com

Ref: MU/CHS/ACD/12

11th April 2013

TO WHOM IT MAY CONCERN
IN THE COLLEGE OF HEALTH SCIENCES

RE: HARUN CHEMJOR CHEPKEITANY: CENSUS SURVEY FOR PhD THESIS

Harun, a PhD student in the Department of Medical Education in the School of Medicine has his proposal approved by IREC.

He will request your participation in his project.

Please accord him the necessary assistance as he has been authorized to do so. His IREC approval is IREC/2012/38 approval number 000948.

PROF. F. ESAMAI
PRINCIPAL, COLLEGE OF HEALTH SCIENCES

Appendix IV: Transmittal Letter

MOI UNIVERSITY

P.O. Box 3900-34100,

ELDORET

Date: 18th March 2013.

Dear Sir/Madam

I am a student at Moi University, College of Health Sciences, Department of Medical Education, pursuing a *PhD* in Medical Education.

Currently, I am conducting a research study entitled

“COMPETENCY PERCEPTION OF MEDICAL EDUCATORS IN INNOVATIVE MEDICAL CURRICULUM PLANNING AND DEVELOPMENT IN MOI UNIVERSITY, COLLEGE OF HEALTH SCIENCES.

The findings of this study will contribute to knowledge will greatly assist the institution in making decisions regarding innovative medical curriculum planning and development. The findings will also be useful in developing an elaborate criterion by which the principles of curriculum reforms can be judged and improved. The findings generated from this study will be communicated to you upon completion.

You have been identified as one of the respondents in this study because, you are considered to be well qualified, experienced and possess the attributes and characteristics sought in this study.

The purpose of this letter is to request for your participation by responding to the question items regarding the study and returning it on the date specified.

There will be no direct benefits, no risks, no hazards or discomforts associated with this study procedures.

Identity is concealed and therefore, you are requested not to reveal your name and information provided will be highly confidential and will be used only for the purpose of this study.

Participation is voluntary and that you may, at any time during the course of this study be free to withdraw without any penalty, injury or loss of benefits if any.

Should you have any complaints concerning this study, you are free to contact the Chairman, Secretary or any other official of the Institutional Research and Ethics Committee (IREC), Moi University/Moi Teaching and Referral Hospital, **P.O Box 3 or 4606**, Eldoret, **Tel. (053)33471/2/3**.

Kindly return this questionnaire/instrument by *18th April 2013*.

Thanks in advance

Yours faithfully

Harun Chemjor Chepkeitany-Researcher

Cell Phone No 0722451626