IMPLEMENTATION OF INNOVATIVE INSTRUCTIONAL METHODS IN PUBLIC HEALTH PROGRAMME AT THE COLLEGE OF HEALTH SCIENCES, MOI UNIVERSITY, KENYA

BY

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DECLARATION

Declaration by the Candidate

This thesis is my original work and has not been presented for a degree in any other university. No part of this document may be reproduced without the authority of the author and or Moi University.

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This work is dedicated to the Department of Medical Education, School of Medicine, Moi University and all the Students who have undertaken their studies in Medical Education.

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ABSTRACT

Background: Public Health is one of the Schools in the College of Health Sciences, Moi University that specializes in training Health Professionals. The School offers a degree Programme in Bachelor of Science in Environmental Health and postgraduate degree in Master of Public Health among others. This Programme aims at addressing environmental health issues and problems from a global perspective with a view to proposing solutions in the provision of health care. The Innovative Instructional mode of teaching was adopted in the College of Health Sciences since its inception in 1990. However, the level of Lecturers' perspectives and determinants of implementation of these methods have not been investigated.

Objectives: To establish the level of knowledge of innovative instructional methods among lecturers, assess extent to which innovative instructional methods are applied in implementing Public Health Programme, examine factors that determine the implementation of innovative instructional methods in Public Health Programme and describe the challenges faced in the use of innovative instructional methods in Public Health Programme.

Method: The study design used was mixed methods approach involving both quantitative and qualitative strategies The target population was undergraduate Public Health Students, the lecturers, Heads of Departments and the Dean School of Public Health. Purposive Sampling was used, then, Stratified sampling was done. The sample size was one hundred and thirty five respondents. The quantitative strategy gathered numeric descriptions of knowledge level of innovative instructional methods among lecturers. The qualitative strategy identified students and lectures experiences about determinants of use of Innovative instructional methods. Quantitative data was analysed using linear regression statistical method while Qualitative data was analysed using descriptive statistics. The qualitative strategy complemented the quantitative strategy. The respondents were one hundred and three students, twenty six lecturers, six Heads of departments and one Dean of the School of Public Health.

Results: The findings indicated adequate levels of knowledge on innovative instructional methods among lecturers as shown by 100% response for Problem Based Learning and 82% for Self Directed Learning. Innovative instructional methods are used to some extent by majority (58 %) of the lecturers. Results of applicability of innovative instructional methods were significant at p value of 0.005. High Student to lecturer ratio was the major factor (58%) that influences use of innovative instructional methods. Both lecturers (100%) and students (88%) affirmed that there were challenges, majorly resources (50%) experienced in the use of innovative instructional methods.

Conclusions: The level of knowledge on innovative instructional methods was adequate; Innovative instructional methods are used in teaching of Public Health Programme; both major and minor factors determine implementation of innovative instructional methods; Resources is a major challenge affecting implementation of innovative instructional methods.

Recommendations: There is need to; embrace use of innovative instructional methods in Public Health Programme to a great extent; address both major and minor factors that affect use of innovative instructional methods and address resource challenges that hinder implementation of innovative instructional methods.

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LIST OF ABBREVIATIONS

AV	**:**	Audio Visual
BED	**:**	Bachelor of Education
BYOD		Bring Your Own Device
CAI	**:**	Computer Assisted Instruction
CAA	**:**	Computer Assisted Assessment
CAT	**:**	Continuous Assessment Test
CBT		Computer Based Test
CBL		Computer Based Learning
CME	**:**	Computer Managed Education
CMI		Computer Managed Instruction
COBES	**:**	Community-Based Education and Service
Dr.	**:**	Doctor
ESE	**:**	End of Semester Examination
EYE		End of Year Examination
ICT		Information Communication Technology
IIM	**:**	Innovative Instructional Methods
IREC	**:**	Institutional Research and Ethics Committee
IS	**:**	Independent study
IT	**:**	Information Technology
ITL	**:**	Innovative Teaching and Learning
KAP	**:**	Knowledge Attitude and Practice
LCD		Liquid Crystal Display
LEQ	**:**	Long Essay Question
MCQ	**:**	Multiple Choice Question
MoE	**:**	Ministry of Education
ME	**:**	Medical Education
MOOCs		Massive Online Open Courses
ODEL	**:**	Open Distance Education Learning
OECD	**:**	Organization for Economic Co-operation and Development
OSCPE		Objective Structured Practical Examination
OS		Operating System
PC		Portable Computer
PBL	**:**	Problem-Based Learning
PhD	**:**	Doctor of Philosophy
PHP	**:**	Public Health Programme
Prof.	**:**	Professor
RO	**:**	Reflective Observation
RTTC	**:**	Regional Teacher Training Centre
SAQ	**:**	Short Answer Question
SDA	**:**	Social Development Association
SDL	**:**	Self - Directed Learning
SM	**:**	School of Medicine

SGDS	**:**	Small Group Discussions
SGTS	**:**	Small Group Tutorials
SPICES	**:**	Student-centered, Problem based, Integrated, Community-based, Electives and Systematic
SSM	**:**	Special Study Module
SPH	**:**	School of Public Health
WHO	**:**	World Health Organization
WI-FI		Wireless Fidelity
WIL		Work Integrated Learning
USA	**:**	United States of America
VILT		Virtual Instructor Led Training
VLE		Virtual Learning Environment
Yr.		Year

DEFINITION OF TERMS

Determinant	**:**	Is a factor that decisively affects the nature or outcome of something either positively or negatively.
Implementation	**:**	It entails the procedural applications that are involved when applying a particular method in order to achieve a specific purpose. It also refers to the levels upon which the intent of innovation as outlined in the curriculum protocol is transformed into reality.
Innovative	**:**	This is defined as a new pedagogy aimed at enhancing individual conceptualization of information. These pedagogical skills will encompass instilling skills and competencies amongst learners, promoting collaborative and problem based learning methodology to teaching environments.
Instruction	**:**	Teaching and learning process of an Education Programme.
Innovative instructional methods	**:**	Refers to teaching and learning strategies, approaches, techniques or tools that are used in a way to produce quantifiable gain for students' outcome or the students' experience, and can be implemented differently as per the learning situation.
Intervention	**:**	Strategies put in place to influence the existing practices or what happens. In the present study, strategies to influence implementation of innovative instructional methods.
Programme	**:**	A plan of learning activities organized by an educational authority and / or educational institution.

CHAPTER ONE
INTRODUCTION TO THE STUDY

1.1 Introduction

This chapter discusses the background of the study, statement of the problem, justification, significance of the study, purpose of the study, objectives, research questions, hypothesis, theoretical framework, and conceptual framework, scope of the study and limitations of the study. The purpose of this chapter is to introduce the reader to the conducted study by giving preliminaries. This chapter gives a brief history, brings out the problem statement and explains why the study was done.

1.2 Background

Despite program implementation topic being mentioned by authors such as (Duttweier *et. al*., 2019), it has not been given the attention as expected, given the potential it possesses. OECD (2019) has stipulated there has been continued lag in classroom that has led to underachievement of goals regardless of inspirational examples of teaching that is innovative. This gap between the idealism of change and the realism that is witnessed in classroom is attributed to inaccessibility of resources, low levels of training and the inadequacy in the overall objectivity of the systems. The current systems although organized, are still inclined to the traditional or rather conventional measures of achievement. Majority of the students are subjected to lecture- based methodological practices that are deficient of technological advancements (Kafu, 1976; Bransford *et. al*., 1999). Hence the need to investigate which mitigations should be used to redress this persisting conservative approach to preparing Health Professionals.

Moi University comprises the college of Health Sciences that is situated in Eldoret town, adjacent to the Moi teaching and referral hospital. This college began in 1989bas a faculty of Health Sciences; it constitutes four schools, namely, Medicine, Public Health, Dentistry and Nursing, upon management's proposal to recognize the human resource development. The University in 1998 established the school of Public Health (SPH). The school has been mandated to offer a four year science degree programme in Environmental health and also a postgraduate degree in masters of Public health. The main purpose of the Bachelors of Science in Environmental Health is to produce global, dynamic and reflective view of solution to problems bedeviling the provision of health care.

Amongst the models that the school of Public Health has adopted is the problem- based approach to teaching. This approach adopts the SPICES model of Innovative medical education that is, student –centered, Problem based, Integrated, Community Based Education and Service, Electives and Student centered. The Community Based Education and Service program at Moi University has been a compulsory component in the school of Public Health more than three decades ago since the school was incepted in 1998. The COBES programme purposes to provide training that is relevant to health experts as well as serving the immediate community. Students in the Public Health programme are involved with the COBES system in order to achieve the practical experience that is needed at all levels of the health systems nationally. This also includes the county levels that incorporates the urban and rural set ups.

It is important to note that the Community – Based Education and Services program being offered at the School of Public Health covers and serves the regions of Rift Valley, more specifically the populous North Rift region, and the former Nyanza and Western provinces. Students undertaking COBES program are expected to go through distinct courses during the four year period in the university. All the COBES courses consist of a theoretical component that has to be done comprehensively before a student proceeds with the practical or rather the clinical aspects in the field. These courses ushers students to Community Health, research proposal advisement or development, community diagnosis implementation interventions, participatory health management at the county levels and Problem- based curriculum that reflects upon the problems and needs of the communities in both urban and rural set ups.

1.3 Statement of the Problem

The paradigm shift from traditional instructional methods to innovative instructional methods has been emphasized in order to respond to challenges and trends in Health professions training and education. This is an outcome of knowledge explosion that has been witnessed in the developing nations which have undergone rapid changes in technology. The conventional classroom can no longer accommodate the new educational practices and experiences amongst students. This has pushed instructors to come up with strategic and incisive practices that are different with the conventional classrooms (Reiguleth, 2012). Instructors handling Health Professionals have felt the importance of utilizing these new teaching and learning strategies in order to have trainees who are well qualified.

Amongst the leading proponents towards this goal is the College of Health Sciences at Moi University which has put all efforts to ensure that its trainees are equipped with the necessary practical component and intellectual skills through its adoption of active learning modalities. One such modality is the use of innovative instructional methods. Attention is placed on the students' acquisition of knowledge and skills through an individualized learning, problem solving and effective communication skills. This modality has been in place since the inception of the school in 1998. It is not clear what determines its implementation. The level of and determinants of the implementation of innovative instructional methods in Public Health Programme has not been investigated, hence the interest in the present study. Research that is implementation based is amongst the most critical, though neglected aspect of research that is evaluative in nature, Literature indicates that the implementation research has been ignored (Potter *et al*., 2002).

1.4 Justification

There is growing common ground being developed by researchers and educators globally on why teaching and learning should change in order to produce learners with the necessary skills that are essential in the 21st century (Ananiadou *et al*., 2009).

Currently, efforts are being done to fix the students at the periphery of the teaching and learning activities in the classroom. This implies that the focal point for the 21st century classroom is for the student to experience and attach themselves to the environment that they will ultimately enter as modem day employees. This will require that the students have effective a communication skills coupled with cooperative skills that will build upon them an adept skills to adopt technology and all their essential skills that they will need in the 21st century.

Both students and teachers should be put into consideration when considering the modern day classroom. This is based on the fact that students are the central focus and therefore the teaching and learning should be student centered. On their part, teachers need to play the rule of facilitators and mentors rather than being the active providers of knowledge. The teacher ought to ensure that students are not passive listeners but rather active participants in the learning process that is adaptive to the varied methodological and pedagogic approaches.

In the light of this the study categorically states that training in the health profession has and is still undergoing massive transformation that is aligned to improving the efficiency, effectiveness and quality of the health professionals and the health services delivery around the world. Health professionals contribute greatly to the development agenda of the national agenda (Kafu, 2017). As such, it is very important that the education and training of the health professionals crystalizes on the epitome of knowledge and skills acquisitions.

In the wake of knowledge based economy, the realignment of education should be biased towards equipping the next generation with adept creative effective novel and innovative abilities that are essential in their generational journey. This calls upon the teachers to be creative in their teaching through application of creative teaching methodologies.

Though recent research has focused on barriers to the implementation of innovative instructional methods, limited research has focused on the determinants of the implementation of this mode of instruction hence the need to study what influences this process. Therefore this research on implementation is fundamental to evidently understand programme outcomes.

1.5 Significance of the Study

Evidence of high quality is needed in order to ascertain the theory, policy and practice of the highest standards.

Research on implementation is fundamental in objectively understanding the programme outcomes. Existing literature pinpoints the importance of examining and evaluating implementation of programmes and the ensuing interventions. Research findings indicate that programme outcomes are influenced by implementation (Done, *et al*., 1998: Dusenbury, *et al*., 2003)

Getting a precise picture on how best the programme was implemented aids programmers to link more appropriately with the programme under observation (Dobson *et al*., 1980). Besides, research findings of the implementation gives educators inactive thoughts on how programmes are being carried out and how well they can be upgraded (Rossi, *et al*., 2004).

Effective implementation education of the instructional programme requires educators to concisely understand what a programme sets out to achieve and how it ought to be put in practice. Together the outcome of the programme are generated data on implementation will pave way for educators to decipher what transpired during implementation of the project/programme and the resultant outcome. From this educators are bound to be empowered to understand the administration of the current instructional programme; better up futuristic services and eventually improve and serve their students better.

This study is significant in establishing a logical start up from which to commence on further work that can aid the staff, administrators, educational developers and students in their strategies and approaches to new ways of teaching and learning. Innovative instructional methods foster development of the students and lecturers talents.

1.6 Purpose of the Study

The study is aimed at examining the implementation of innovative instructional methods in Public Health Programme of Moi University and also identify interventions to promote its implementation.

1.7 Objectives

The broad objective of this study was to find out what influences the implementation of innovative instructional methods in Public Health Programme of Moi University and identify interventions to improve implementation.

1.8 Specific Objectives

The specific objectives of this study were to:

i) Establish the level of knowledge of innovative instructional methods among lecturers of Public Health.

ii) Assess the extent to which innovative instructional methods are applied in implementing Public Health Programme.

iii) Examine factors that determine the implementation of innovative instructional methods in Public Health Programme.

iv) Evaluate the challenges faced in the use of innovative instructional methods in Public Health Programme.

v) Highlight possible interventions in implementation of innovative instructional methods in Public Health Programme.

1.9 Research Questions

i) What is the level of knowledge of innovative instructional methods among lecturers of Public Health?

ii) To what extent are innovative instructional methods applied in implementation of Public Health Programme?

iii) What factors influence the implementation of innovative instructional methods in Public Health Programme?

iv) What challenges are faced in the use of innovative instructional methods in Public Health Programme?

v) What are some of the interventions in implementation of innovative instructional methods in Public Health Pogramme?

1.10 Research Variables

The independent research variables were resources (physical, human, time, financial), Instructional supervision, Administrative support, Learning environment, Staff development and participation, Change, Student role and Assessment. The dependent variable was Implementation.

1.11 Hypothesis

There is no significant difference between determinants and implementation of innovative instructional methods.

1.12 Theoretical Frame - work

In order to enhance the validity of this research, and make it more authoritative the study was anchored on the following theoretical and conceptual framework.

1.12.1 Constructivism Learning Theory

This theory was founded by Jean Piaget in 1976. The theory advances the significance of involving learning in active participation with the aim of constructing knowledge for the individual learners. These students are assumed to utilize a background knowledge and concept that normally aid them during the acquisition of new information. John Dewey, Kolb and Maria Montessori' s learning theories provides the platform for the

use of the constructivist learning theory comprises a myriad of concepts such as active learning, discovery and knowledge building. Of essence is that all the concepts provides or rather enlightens the students to more flexibility within a given blue print or system (Lombardi, 2011).

Constructivism stipulates that the role of the teacher is that of a facilitator tasked with the role of motivating students to discovering new tenets and facets of knowledge by themselves. Through such a development the students are well placed to construct their own knowledge through self-conceptualization. This can be enhanced through the teacher who instills curiosity and debate among learners putting into mind their autonomy. Curiosity can be developed by teachers through adding raw and challenging data, new resources and materials in order for students to critically analyze (Dexvies, *et al*., 2003).

The constructivist view to learning in the classroom is fashioned in Bruner (1961), Piaget (1972) Vygotsky (1978) and Dewey (1997) developmental theories. Piaget's works that gave birth to cognitive construction postulates that a person's reaction to experiences is likely to lead or fail to lead to learning. On his part Vygotsky social constructivism stipulates that factors such as language, communication and social interactions among peers, family and teachers is significant in the construction of meaning from experiences. According to Vygotsky, meaning is co-constructed and not just constructed (Biggs 1996).

Effective learning based on this constructivist theory of learning, should encompass an array of conditions. Teachers ought to set up experiences that will trigger students to be able to co-construct knowledge on an individual or student centered basis.

Innovative Instructional Methods are student - centered where the student has to seek to learn independently with minimal guidance from the facilitator, this approach fits in the Constructivist theory of learning where students are to construct knowledge for themselves.

1.13 Conceptual Framework

As stated by Mugenda and Mugenda (2011) studies are guided by conceptual framework that is developed by the researchers. The Study was guided by a conceptual framework developed by the researcher. A conceptual framework explains

diagrammatically the relationship between the Independent variables and dependent variables. In this study, independent variables were determinants like resources (physical, human, time, financial), Instructional supervision, Administrative support, Learning environment, Staff development and participation, Change, Student role and Assessment while Implementation was the dependent variable.

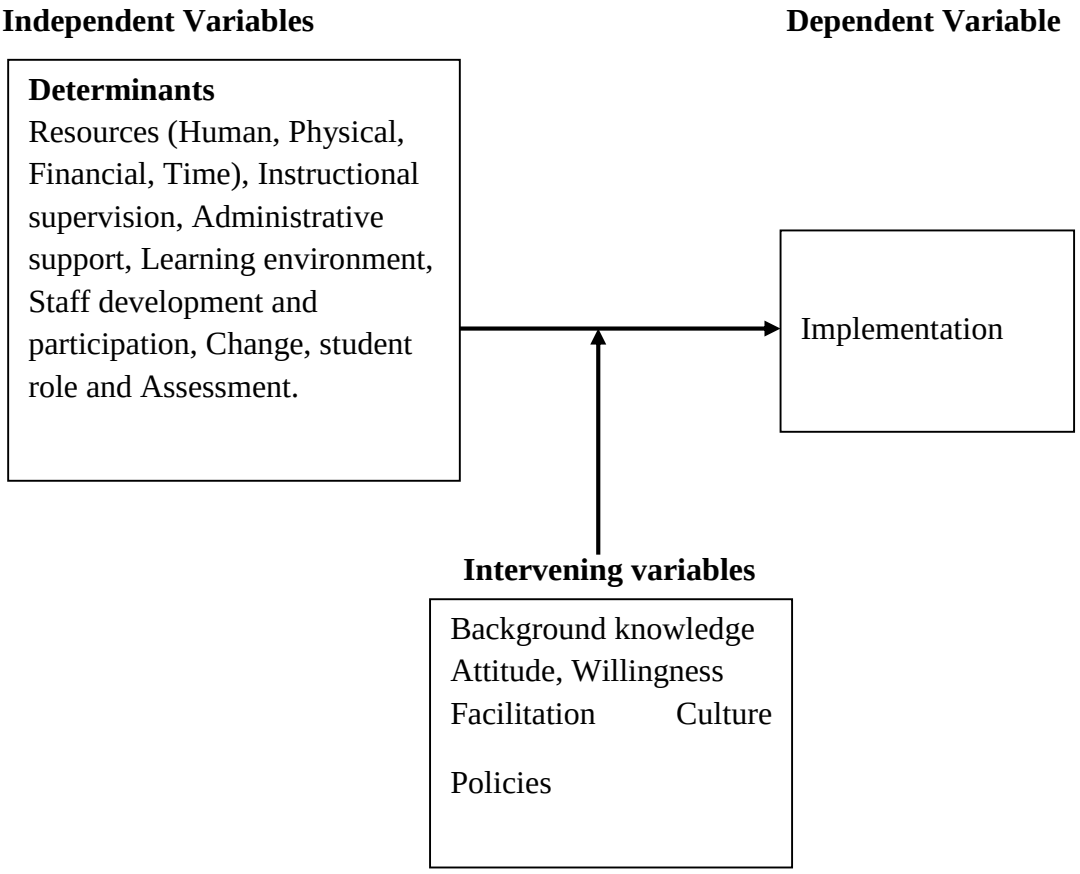

Figure 1: Conceptual Framework

1.14 Scope of the Study

This study was on implementation of innovative instructional methods in Public Health Programme. The study was carried out in Moi University, town campus, college of Health Sciences, School of Public Health. Respondents were confined to Students, Lecturers and management team of School of Public Health.

1.15 Assumptions of the Study

The study assumed that all respondents did not have a biased attitude towards innovative instructional methods and they therefore gave honesty answers. That the researcher was keen enough to avoid errors while collecting data and analyzing data to ensure accuracy.

1.16 Limitations of the Study

Moi University has several satellite campuses. However, this study specifically focused on the School of Public Health of the College of Health Sciences of Moi University Town campus. There are four Schools in the College of Health Sciences of Moi University namely, Medicine, Dentistry, Public Health and Nursing. However, this study focused on the School of Public Health. Furthermore, Public Health Programme is offered in other Public and Private Universities in Kenya. Due to cost and time factor limitation to visit all these institutions, the study was only done in Moi University (Town campus). Hence, the findings may not be generalized to other Schools in the College of Health Sciences and other Schools of Public Health in all the other Universities in Kenya. The study did not gather data on all aspects that could have been included in the study like competency of lecturers. It could have been difficult to determine competency just based on responses from the questionnaire. Also all observations and interviews were conducted and analyzed by one researcher. This may have limited the understanding of the results to the researcher's own biases.

1.17 Summary of the Study

This chapter introduced the study by discussing the background, the statement of the problem, the justification, the significance and purpose of the study, the objectives of the study both general and specific, research questions and research variables, the hypothesis, scope of the study, assumptions and limitations of the study

CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

The review of literature on implementation of innovative instructional methods in Public Health Programme focused on the stated objectives out lined in chapter one. The literature is discussed under global historical overview of innovative instructional methods, specific innovative instructional methods, use of instructional media in innovative instructional methods, determinants of implementation and challenges faced in the implementation in relation to similar studies. The purpose of this chapter is to provide a scholarly analysis of both general and specific literature related to this study. This chapter also aims at establishing the existing knowledge gaps in this area of study.

2.2 Historical Overview of Innovative Instructional Methods

2.2.1 Global Historical overview of Innovative Instructional Methods

Innovative education can only be broadly described as the acquisition of knowledge that can be utilized to enhance innovation, ability and creative opinion as its core presumption. (Su Wangehu, *et al.*, 2012). The major four aspects of innovative education includes: Inspiring students, critical awareness and inquisitiveness. Secondly it comprises adherence to innovative activities that can be internalized, thirdly exercising creative thinking in the teaching and learning process and fourthly development of students' creative practice.

In 1951, World Health Organization (WHO) mentioned the importance of having innovation in medical education. Subsequent effort saw WHO launch its first ever medical education eight years later in 1959 at the University of Illinois. Over a decade later WHO initiated a well elaborated coordinated futuristic programme that was long term for the health professional trainers. A host of centres followed the commencement of WHO center at Illinois, in the period running 1971-1973. These centers were globally located. In Europe there was the launching of WHO regional Teacher Training Center for English speaking countries and also French speaking countries WHO Regional Teacher Training Centre (RTTC) more specifically at Yaonde ; In Africa there was the WHO- Regional Teacher Training School (RTTS) at Makerere University in Uganda; another WHO Regional Training Centre (RTTC) at University of Younde in Cameroon meant for French speaking countries; To the North and South American Continents there was WHO, Regional Teacher Training School (RTTC) in Mexico and in Brazil

(Rio De Janeiro). Asian continent had the Panari University and lastly there was University of New South Wales in Sydney, Australia.

After the inception of innovative medical education, Ham and associates working under the auspices of Case Western University, Cleveland Ohio, USA infused problem solving approach to the medical curriculum in 1961. A comparative analysis between the two groups of students taught in the didactic and the innovative approaches (PBL-SDL) indicated that students taught using innovative approaches were superior in test scores.

After the application of the medical education, Howard Barrow of McMaster University in Ontario, Canada, conceptualizing the first problem solving curriculum .the development approach was PBL. This approach resembled the case method and the discovery learning. This development paved way for the establishment of the University of Maastricht as the first university to adopt a medical school after an innovative education curriculum (Harden, 1986).

Other reputable Universities to launch the innovative medical education programme included most recently, the Suez Canal University in 1982 that established the faculty of medicine. Earlier on there was the establishment of New Castle University in Australia in the year 1979.

Other than host nation World Health Organization (WHO) as mentioned earlier has played a crucial role in the founding of innovative medical education programmes. This can be seen through its support of the community oriented education institutions in 1979. Later in the 1990s through the efforts of WHO, fifty countries had become members of the network. By mid 1990s another seventy countries had signed up in the problem based learning (Hamad, 1991). It is important to recognize this development in Kenya as showcased by Moi University which through the college of Health Science became the first centre for Problem Based Learning in 1994. Public Health Programme is taught at the college of Health Sciences of Moi University. Since the Public Health Curriculum is offered through Problem Based Learning (PBL), it is important to seek to understand what determines and how this method is implemented in the Public Health Programme.

2.2.2 Innovative teaching in higher education

There are many theories and application for innovative teaching related to students' behaviours, methods, approaches, and strategies (Anderson, 2008). Teacher competency plays an important factor in delivering innovative teaching in higher education. Those competencies are professional certification, cognitive abilities, affective-motivational characteristics, mastery of teaching and learning contents, and pedagogical approach (Blömeke *et al*.., 2014; Harris *et al*., 2009). There are four core competencies to deliver innovative teaching; innovative learning competence, innovative social competency, innovative educational competency, and innovative technological competency (Zhu *et al*., 2013).

Innovative learning competence refers to the knowledge on how teachers update subject knowledge and contents enhance methods to gather new knowledge, improve ways in getting learning materials, and solve learning problems through self-reflection (Soto Gómez *et al.,* 2015). This competence aims to improve individual knowledge competencies so that the teacher can deliver knowledge effectively to his or her students. In addition, the ability to access reliable data can help the teacher enhance innovative learning (Livingstone, 2012).

Innovative social competence is an ability to communicate socially with students from different backgrounds (Jeffrey *et al*., 2004). In online learning, this refers to the innovative skills of the teacher's ability to tolerate the social aspect of the digital nature of communication where students are absent from physical interaction and expression. Therefore, innovative social competence must have a presence in order to avoid confusion, frustration, miscommunication, and the challenging behaviour of online users. Teachers need innovative social competence in online teaching and learning environments (Runco, 2003). Innovative educational competency refers to the ability of integrating subject knowledge, pedagogical aspect, and learning psychology to achieve the development of students in understanding the topics taught (Runesson *et al*., 2015). In online learning context, the teaching facilitators need to guide students effectively with the passion of encouraging active learning in virtual teaching effectively (Asyari *et al*., 2016).

Innovative technological competency helps teachers to find reliable and comprehensive information from online sources to enhance teaching and learning activities (Lawless

et al., 2007). This also refers to the method in data gathering from a multitude of data sources to use effectively in supporting innovative teaching (Salleh, 2016). ICT has been used often as a tool to support innovative teaching (McPherson *et al*., 2004).

2.3 The Concept of Implementation

Literature on the concept of implementation explains that it entails the incorporation of the approved syllabuses and it entails the incorporation should encompass the practice or appreciation in the classroom. The purpose of this incorporation is to enable the acquisition of experience knowledge and skills of the learners. This implies that the learner is the focus in the entire process of curriculum implementation according to the Nkomo (1995). These processes are juxtaposed alongside the acquisition of the planned and intended experiences by the learner. The merging of the two will eventually bear a learner who is well adapted to the learning environment.

In light of this dimension curriculum implementation can also refer to the point in time when the curriculum as the adhoc educational programme is put into practice. To this end stem house (1979) points that the teacher is an important place in the curriculum implementation process. The author usefully argues that the process of implementation will enable the teacher to choose the most valuable aspects of the curriculum and plan how it will be disseminated in the classroom. By carrying out this process the teacher will be seen as having integrated the teacher constructed syllabus with her personally and the materials within the teaching environment (Nkomo, 1995). In in a nutshell therefore curriculum implementation can be viewed in the realm of planning designing and translating the course study into workable syllabus schemes of work and eventually well prepared lesson plans.

Modern day educators in the twenty first century classroom should therefore put into focus the implementation of curriculum based on integrity knowing that students' behavior is situational and not contextual. Students behavior should not be limit the teacher pre-determined preparedness of in curriculum implementation. From the foregoing discussion it is imperative that teachers or educators should be privy of the challenges that accompany the implementation of the curriculum such as the intrinsic behavior of the student and the availability of resources. Of essence therefore is for the teachers to be conversant and cognizant to the varied needs of the learners. This will ensure according to Porter *et al*. (2002) that the needs of the learners are met the

successful implementation of this curriculum. These points to the very important place that a learner occupies in the process of implementation and why it's very critical that there needs are addressed accordingly.

Just as literature pointed out issues of integrity the literature further stipulates that implementations of the curriculum should also be accorded the fidelity it deserves this entails constituency in the implementation process that puts into focus students challenges through proper facilitations by the teachers. For the curriculum to be seen as effective, matters associated with evaluation should be brought on board. Assessment need to be carried to evaluate what has been taught and where the curriculum was suited to the needs of the students. As it is the case with evaluation, close monitoring and continuity is needed to be able to gauge the stepwise implementation of the curriculum

Moving away from matters related to integrity and fidelity scholars also mention that curriculum implementation should be built on a foundation of interaction between the proponents or simply put the designers of the curriculum and those who are to deliver it this is emphasized by Ovnstein and Hunkins (1998) who opines that curriculum implementation will require educators to have a shift in philosophy by moving away from the conventional programme they are used to towards the other modified or rather new curriculum.

According to this question it is important to note that changes are necessary in the implementation process. Besides, actions and attitudes the players also play a critical role in the implantation process. This charge will require that considerable effort and time are put in place to reduce the pressures and anxieties that are mentioned will entail the reorganization of the change into manageable events and not a wholesome change in order to achieve the set goals.

Lastly, but very importantly implementation. Other than involving integrity, fidelity, interaction and change entails a prowess that calls for professional development and growth the key players. Interactions between the key players and feedback. To this end it involves clarifications on the part of individuals and groups who need to understand and implement the transformations involved. This clarification will call upon the individuals and groups to use new resources adopt supportive atmosphere that is open to trust and two way communication between the educators, students and administrators.

2.3.1 Conditions for Successful Implementation of Innovations

According to Colliver, *et al*. (1999) curriculum implementation can be said to be successful if it effectively occurs in the realm of five components that are integrated in the classroom set up. The five components include one the content and skills that is supposed to be taught and assessment done through a research based curricula. Two, evidences based interventions that are used to teach content /skills, manage behavior and support differentiated instructional needs. Three, the arrangement and set up of classroom should be instructional based. Four, the overall classroom instructional management which includes addressing both academics and behavioral aspects of teaching and learning, and lastly five, evaluation of progress to assess learners growth in achieving the bench marks and or/meeting supplementary needs.

However it has been noted that regardless of the important role and values that these components bring into the process of implementations, many at times they are not applied in the implementation process. Scenarios where content and skills are considered while evidence based interventions are not considered have been reported.

This may be attributed to what Fullan *et al*. and Pomfret (1977) posits as time constraints training interactions and other people based on challenges. In the same breadth Nkomo (1995) opines that the potential users of the implementation may also be instrumental in the successful implementation the university posit that users in this case students will accept the implementation only when the five components are met.

This implies that the innovation ought to be relevant to them. Besides it should be accessible, compatible with the practices and values and characteristics of their system, in addition it should not be seen as a threat in essence what we are looking at is that it should have limited threats and many opportunities. This shows that it needs to be tolerable and non-threatening. The users of the innovations should be able to see the actual benefits that accompany the innovation. Benefits in this scenario can be material or non-material benefits. A case example of material; benefit includes again in the social economic status or recognition and the non-material benefit should entail flexibility and adaptability of the programme.

From the foregoing it would be pertinent to note that even with full consideration of the components there is no guarantee that the users will be able to utilize the innovation. It

is important to note that it can be accepted or rejected depending on how relevant or irrelevant the innovation would be to the educators, designers and students.

2.4 Factors hindering implementation of innovative instructional methods

According to Fullan *et al*. (1977) several factors have been acted to negatively impact on the implementation of innovative methods.

2.4.1 Staffing Issues

Staffing according to this research can be defined as the total number of the personnel within a given department in a learning institution. In terms of hindering the implementation of innovative instruction methods, high staff turnover may lead to overload and stagnation of the implementation. Newly appointed teachers are inexperienced and may find it difficult to implement the methods. Such teachers would need time for orientation thereby impacting negatively to the reviewers of the programme.

Staffing issues can also be looked in the perspective of resistance to change. This applies to very experienced members of the teaching staff who have taught for many years. Such teachers may show apathy to the innovative methods and rely upon the traditional methods of pedagogy which contravenes the new innovative methods. From experience such teachers need to be controlled early enough on the vision statements of the innovation programmes the values that are upheld and the principles of implementations.

Change of guard in the management of the institutions may have impact on implementation of innovative methods. This can be tied to a situation where the incumbent principal has adoptive to change while the incoming principal is resistant to change.

2.4.2 Resistance to Change in Implementation

Bell (2015) just like Baumi (2015) has recognized resistance as a hindrance towards teachers' implementation process of the new curriculum. Teachers who are bounded to speedy guides with the notion of understanding the course objectives in a specified time will struggle to adopt to the new innovative methods for fear of an administrative punishment. (Baumi, 2015; Mcveil *et al*., 2016)

Resistance to change is as are if of misunderstanding the change itself. This arises from educators who do not follow what the change stipulates. This results into lack of direction unclear instructions of what ought to be implemented therefore resulting into lack of ownership. Resistance arises also as a result of failure to involve the educators who feel that the change in the innovative methods is imposed in them. It is unfortunate that that these are bound to continue because the teachers are only involved in a certain stage while the external players are involved in large number of stages.

Another of the reasons attributed to resistance is the purposed incompetency of the teachers to cope up with the changes it is naturalistic for teachers and other personalities to resist what they don't understand or don't have skills to cope up with. So in order to be seen as incompetent teachers would rather reject the innovative methods. Incompetency can be attributed to rushing of the implementation process as lack of adequate training amongst teachers.

Further reasons given for resistance entails the lack of incentives and rewards that accompany the work involved during implementation. Many at times these changes are envisaged to bring benefit to students and teachers will opt to resist changing. To teachers this is seen as additional responsibilities that involves juggling between initiating change and managing the responsibilities

2.4.3 Time

There is an essential element in the implementation of the innovative methods. Though cited as a barrier literature indicates that it should not be an issue as proper planning is only what is needed.

2.4.4 School Structures

Innovative instructional methods calls upon restructuring of the timetable in public health programme. Time and allocation of venues can impede the implementation especially when there happens to be clashes.

2.4.5 Conflicting Demands

Competition that is witnessed during assessment in between college may be a hindrance to the successful implementation of the curriculum. This is even exacerbated with the job market demands that will have anything demands as regards the curriculum programme. Coupled with this are the inadequate skills amongst implementers, negative attitudes amongst students and teaching staff.

Several studies support the hunch that attitude is significantly related to effective teaching achievements. Brown (1982) assents that teachers being information providers need to have a proper frame of mind. Reay (1975) delves into this debate saying that matters related to attitude cannot be disassociated from constrains of time that teachers undergo during preparation. According to the author poor attitude may be as a result of inadequate time to prepare. Apart from time Gallord *et al*. (1994) mentions teachers personal style in the interpretation of the curricula content and pedagogy may contribute to attitudinal issues.

Other than the aforementioned factors, there are also other aspects such as knowledge explosion, communication and technological advances in the society fear of the unknown, traditional values, society's values and inadequate resources in institutions.

2.5 The Concept of Determinants

Determinants are ideas, concepts or factors that underline the use / application of a given process. The main determinants of implementation of innovative instructional methods are resources; Human, Physical infrastructure, Material (teaching and learning materials), Learning resources (library facilities), Finances and Time.

Other determinants include effective leadership and management practices in Public Health Training Institutions, administrative support, Instructional agents (teachers' characteristics and decisions), motivation, willingness, attitude, change (in materials, teaching approaches and beliefs) and behavior change, Teacher training modes (staff development) and participation, skills, staffing, student enrolment (class size), student focus, evaluation appropriateness, community participation, practicum sites, organizational structures, networking systems, availability of information, curriculum attributes (complexity), level of familiarity with curriculum methods and monitoring of the implementation.

2.5.1 Resource Support

Meaningful teaching and learning can only take place when there is resource materials and facilities. The Ministries of Education in Kenya is the one that is tasked with provision of material such as textbooks, teaching aids and stationery in order to enhance the learning process. The ministry is further mandated to provide classrooms for teaching, laboratory for carrying out experiments, libraries and workshops for practical. Occurrence of such materials enables for creation of a conducive learning environment

in which curriculum implementation can take place effectively. It has been stated that with availability and quality resources curriculum implementation is bound to be effective (Fullan *et. al*., 1977).

Studies done by Fullan *et al*. (1995) on resources availability indicate that the resource the resource outlay or the initial resources blue print can be used as predictor variable of instrumental method. Availability of these resources should not only be short term based but offer a long term solution to curriculum implementation.

The effective delivery and evaluation of the curriculum calls for educate human resource be required to support and deliver it. The human personnel should be competent and equipped with technical and pedagogical skill for it to carry out the curriculum wholesomely and not as piecemeal. This will enable them to address the needs of the students in varied contextual set ups (Jeffrey *et al*., 2004).

Other than the resources materials, the layouts plan and qualified staff the equipment that include information technology and audio visual resources, simulators and models, whiteboards, laboratory equipment and flip charts are necessary in terms of resource support. As stated earlier the key partner in the facilitation of the resource in the ministry of education in terms the resource support the MOE should supply resources mentioned and also ensure that institutions have necessary textbooks at a ratio that does not disadvantage the learners. This will enable the students and learners who are tasked with seeing the process to participate actively in the implementation process.

Other than the MOE the National government through the treasury should strive to provide facilitates such as classrooms, laboratories, and library, space for fields and games and workshops to enhance the resource support of the schools. This will enable an environment that is conducive for the curriculum instructions implementation to take place. (Nkomo, 1995)

The adequacy of the resources as exemplified earlier on is critical in the curriculum implementation. A case scenario to mention is the availability of information and communication technology that is peripheral in the application and usage of innovation. Therefore for this innovation to be achieved ICT support platform comprising hardware, number of computers and the quality of the equipments.

In terms of processing speed, operating systems and internet accessibility are very important Venezky *et al*. (2001) pinpoints that in addition to the hardware, it is integral for the institution to appreciate the importance of the software in enhancing ICT challenges in terms of the technical and pedagogic support.

Other resources involved in resources involved in resource support are the e-journals, books and the multimedia resources. Teachers and students should early identify reference materials that can be procured in schools (Kozma, 2003). There materials that can be procured in schools. There materials ought to be supported by the print and electronic packages. Of great importance is the availability and the presence of a library plays as a horst for the resources. In the absence of the schools, the departments should strive to install intranet departmental libraries.

The physical presence of the school should include office space, teaching rooms, personal study spaces that are of good quality spacious and accommodative to learners both in and out of classrooms. Through regularly forgotten or rather sidelined in the infrastructural process, teachers welfare should be incorporated by ensuring that they have adequate and sufficient space to do prior preparations for the lessons. Many researchers such as Sizer (1993) and Tyack *et al*. (1995) have argued that failure to transform the school structure and learning process is just but a recipe for underdevelopment in educational processes. The critical ingredient of this change compromises space, time, communication channels time and the cultural policies of the schools.

Adequate finance is another very important resource needed to facilitate implementation of the instructional method. For the programme to be sustained funding should be given utmost priority so as to run the activities.

2.5.2 Time

How teachers expose themselves to curriculum influence the timelines of implementation of the curriculum. Concerns have been raised by schools as to whether they can be able to manage the time needed for the implementation of the curriculum. Fullan (2001) articulates that schools have raised concern on how they feel on whether time can allow them to effect full implementation. Earlier on Fullan *et al*. (1975) postulated that time is a requirement that allows teachers to prepare, familiarize and adopt materials that will be used effectively in the implementation programme. From

this, it can be seen that time is needed to plan, develop teaching materials and pilot new practices and methods and have feedback on instructional process. Teachers will also need more time to have their own comprehension of the subject matter that they are supposed to teach.

Furthermore time is needed in order manage the teething problems involved in curriculum implementation there is need for them to give a description of the activities that are involved in the implementation. Two they need to designate teachers to the activities that were scheduled. Three specifications on the completion timelines of each stage ought to be undertaken. Aspects surrounding time include preparation and delivery of requirements of the new curriculum. In a nutshell teachers will require adequate time to develop a comprehension of the subject matter that they are supposed to teach (Derrington, *et al*., 2015).

2.5.3 Effective Leadership

Leadership relates to mission direction and inspiration towards achieving required goals. According to Sinnema (2010) there is needed to have committed professional leadership that has the capacity to transform management. Part of the professional leadership as Fullan (1998) and sarajon (1993). Pinpoints requires a functional principal studies carried by Narsh (2001) Berman *et al*. (1997) posits that projects to be implemented that receive principal support are bound to be successful. This is because the principal investment is an indicator of seriousness that the projects deserve. Additionally, the principal who doubles up the leader of the project will give the vision that points a clear clarification on the goals of the project and allows for resource allocation to be conducted in the argued directions. (Rosenholtz, 1989; Meier 1995)

The main aim of the leader is to make each participant in the organization to partake her tasks and roles accordingly. The leader in equation should be a person of fidelity and should have self-esteem and worth. He must be charismatic and competently endowed with knowledge and be professionally trained. Commitment should also be his professional trade and should be accompanied with a high sense of a team leader who is a mentor.

2.5.4 Instructional Supervision

The supervisory function of the principal is very important in the curriculum implementation process. It's only through this supervision and approval as Beach *et al*. (1998) stipulates that the implementation can be achieved.

The principal role in this advertisement should focus on deployment through the allocation of subjects that wait to be taught in the master timetable. Additionally the principal should ensure that there is provision of the teaching and learning resources. Conducive environment for the eventual implementation of the curriculum.

Nkomo (1995) stipulates that the principal is responsible in the monitoring and guiding of the implementation process through the approval and ensuring the coverage of scheme work, lesson plan and recording of masks in the progress records books. The principal through his leadership characteristics ensures that a culture should be developed that will lead to a climate that is conducive towards the implementation process. It is important to note that effective curriculum implementation cannot occur in institutions which the principal is incompetent in the execution of the supervisory functions

2.5.5 Administrative Support

The school administration management support is useful in the implementation process. This support is supposed to stronger and very importantly visible. It is useful to state that Principals' visibility and provision of resources should run currently. In the event a principal is invisible but provides materials of partial implementation will be realized. Likewise a visible principal who provides inadequate resources is also bound to achieve a negative curriculum implementation. All in all visibility and provision need to be provided on same pedestal so as to ensure a positive curriculum implementation. (Derring *et al*., 2015)

Differences in the degree of implementation have been witnessed in contexts that entail assistance support and consultancy (Fullan *et al*., 1995). This calls upon the principal to comprehend the curriculum and be conversant of the particular needs that the curriculum requires. As part of consultancy the school board of management should also be well versed with the educational policies involved in the curriculum implementation.

Support sourced from teachers is not unidirectional but multidirectional involving a myriad of assistances that with help the teacher to successfully their professionalism in the classroom set up. Teacher support should include their administrative powers in instructional resources, peer support, teaching, supervisory support and instructional support from a knowledgeable other. (Guskey, 2002)

Literature on teacher support suggests that on job training support of teachers through guidance, cooperative support staff will effectively apply new skills and innovative methods move than those who are not guided, not incorporated and supervised by the principals (Showers *et al*.., 1996). The most simplistic methodologies that can be used by the principals such as supervision, providing a feedback from the Head of Department or skilled educators have been proven to positively influence teachers practice and innovation (OEEP, 2009)

2.5.6 Community Involvement / Support

There is a mutual association between learning institution and the community. This is based on the assumption that schools are open systems. Being open systems the institutions goals, values, aspirations and mission should be in line with the demands of the community. This implies that the community should be part and parcel in the processes of the practicum. Community leaders' opinions on health matters should therefore be sought in order to enhance a good learning environment in schools thus a higher attainment of scores by students (Shojaeezadeh, *et al.,* 2018).

2.5.7 Culture and Ideology

The different culture and ideals of the communities in a nation can influence the curriculum implementation. Owing to the community resistance to a domineering ideology from the state, implementation may be affected. This therefore calls upon the government to institute good cultural practices that enhances public health practices. On the other hand cultural practices that do not uphold or enhance public health practices should be abhorred (Kai, *et al.,* 2001).

2.5.8 Interest Group

Interest groups comprise parents, teachers associations, parents associations, religious organizations, local authorities' private proprietors among others. This horst of interest groups can influence the implementation of the curriculum in varied ways:

For instance local authorities can provide finance that can be used to purchase the necessary materials; besides the religious organizations can influence the inclusion of religious subjects in the curriculum. The private proprietors may advice on the subjects that offer competitive career opportunities in the job market (Kinsler, *et al.*, 2002).

2.5.9 The School Environment

The school specific circumstances as stated by Nkomo (1995) can influence curriculum implementation. Schools that are situated in very developed socio-economic environments coupled with adequate physical material and efficient human resources can influence the implementation of the curriculum to an extent that schools in otherwise different environments will be impossible to match.

2.5.10 Instructional Agent (Teacher)

One important element and variable in the curriculum implementation is the teacher. Teachers play a crucial role in the implementation of the curriculum through their knowledge base experience; competent skills and the social aspect of learning that are instrumental in the curriculum implementation process. Teachers come with their knowledge that cannot be related to any other. As a result they will be fully responsible in the introduction of the curriculum managing the curriculum in the classroom and assessing it at a later stage of implementation.

The teachers' role is indisputable owing to the continuous regular and interactive nature between them (teachers) and the students in the classroom. The teachers' skills and innovation will dictate whether the anticipated change in the curriculum process will succeed or fail. Therefore the personal attributes of the teacher and the collegial characteristics will impact on the implementation process. Teachers' social interaction that involves how they relate with other teachers is important in the effective implementation programme.

Interactive models involved in the school in between teachers and between teachers and students is necessary during the development and refining of existing and new knowledge. The quality of these interactive models is related strongly with the implementation process. This is in line also with the major innovations in education that involves curriculum innovations, implementative innovations, material innovations and instructional innovations.

The effective curriculum will only be implemented by instructors who have a direct and positive personal interest that is aimed at promoting a positive healthy behavior, a believe in what they do in class such as teaching, a knowledge base concerning the curriculum content and the skills required during the implementation process. Other than the conditions mentioned other key factors include the professional teacher, the interests exhibited from teachers towards the new curriculum and the opportunities that are presented to teachers from the new curriculum. Similarly, professional adequacy, competency involving the confidence interest in teachers will have a significant influence on the curriculum (Hare, 1993). As implementers teachers ought to individually be involved in the change management process by constructing their own terms and understanding of the reality. In a nutshell they need to be changed agents (McLaughlin, 1991).

Though different philosophical beliefs underpins the education systems principles on the learning that takes place in the classroom, one cross cutting assumption is that the teacher is a key element in the learning process. This therefore implies that well prepared good teachers will influence proper learning. The vice versa is true. This is justified because the instructors are well versed with the different practices that are involved in teaching and the aspect of curriculum implementation in the shows. Different authors concur that teachers are instrumental. Mc Neil *et al*. (2016) and Algers and Silver Fletcher 2015) construe that the belief that emanate from teachers can greatly influence the direction of implementation it becomes imperative that teachers take some time to understand their own concerns, values and perceptions in order to improve the implementation process by being actively involved in addressing aspects that will arise (Al-shabatetet *et al*., 2014: Paces, *et al*., 2015)

Autonomy of teachers is viewed by Whitaker (1979) and Nkomo (1995) as an important element in the curriculum implementation. According to the authors, teachers' sole responsibility entails the selection of what is to be taught from the approved syllabus or curriculum. For the teacher to be able to decipher the curriculum into reality it is pertinent that he or she understands the syllabus first. (Nkomo 1995). Based on the fact that the curriculum pocket and by product of teachers and students interactions. This therefore implies according to Wolfson (1997) that teachers will play a significant part in the design of the curriculum. Teachers will be involved in the very initial stage of

planning and later on, the development of the same curriculum inputing the modifications of the curriculum.

In order to foster fidelity, the instructional practices should be aligned to suit the curriculum innovations to be implemented. Mac Donald *et al*., 2016 and Ingrole, *et al*. (2017) pinpoints the importance of also aligning the specific goals as stipulated innovation in the national curriculum. A very important component that should be focused upon is the commitment of the teachers to innovation. This can only be attained through education, training and practice. Such can occur through seminars, workshops and in training. Though education and training are essential to update teacher commitment through workshop, it's important to mention that not all teachers will have the opportunity to undergo the training, owing to limited resources and finances. As an alternative it is recommended that one day long workshops can be carried out that is facilitated by experts who can use lecture based methods to cover a lot of ground (Khan, 2012).

Factors that are extrinsic and can affect curriculum change includes resource adequacy, professional support, school ethics and norms and time. On the other side intrinsic factors may comprise the teachers' professional knowledge, professional adequacy and teachers' motivational interests (Fullan *et al*., 1977)

The two major factors play an important role in professional development that plays a crucial role in the successful implementation of the curriculum implementation. The professional aspects can be viewed from the technical role that places teachers to be technicians thus not requiring teachers to be seen as curriculum developers. Additionally, as technicians, teachers will not be required to engage in undertaking curriculum development in their teacher education programme.

On the contrary, the teacher educational programme should be equipped with curriculum development in theory and in practice for it to qualify as a profession and to also improve and exploit learners' opportunities. This calls upon the integrating of the workshops, seminars and in service to be organized regularly and continuously (Khan, 2012). This is light of the researchers' views who claim that these trainings are peripheral in the innovation and improvements of schools (Goodlad, 1991; Sarason, 1993). A study done by Tubin *et al*. (2002) on the teachers characteristics in the training

of information and communication technology ICT concluded that the most efficient education and training that the teachers should be subjected to should subjected to should encompass the in –house training linked to the actual curriculum as opposed to the pre-existing module where training occurred outside school and a lack has already been initiated.

In regard to pedagogy teachers will need opportunities in order to familiarize themselves with the new pedagogical approaches. Teachers will need to venture into understanding specific skills that are being cemented in the new programme. These may comprise values of teaching and internet. This is in line with the curriculum implementation that entails sub-systems such as delivery, resources and instructional practices that consolidated one another to form a subsistence whole. Fidelity in it is implementation will entail the aligning of instructional practices that support personalized and individualized needs of the students (Causarano, 2015)

As a summary to the foregoing discussions, Friedenberg (1965) posits that personalities who venture into teaching are naturally conformist and would not want to be innovative they have been tended to play neutral and not engage in low purple bureaucratic system headed by

2.6 Factors considered essential or important to lecturers involved in innovative methods

2.6.1 Essential Factors

The following factors are essential to lecturers involved in innovative methods;

Information on educational changes planned for course; Information on a major curriculum innovation about to begin in study area; Information on changes in content planned for the new course; Time of teaching given to develop teaching materials for the team; Staff development meetings with senior staff to give feed – back; Staff development meetings to share and discuss data; Information on design decisions (shape and structure of the course); Staff development meetings devoted to any new skills development and opportunities to see and discuss other people's teaching materials (Mutema, *et. al.*, 1992).

2.6.2 Important Factors

The following are some of the important factors to lecturers involved in implementation of innovative instructional method;

Staff development meetings to include the members of the development team; Information on any revisions being planned in their subject; Participation in decision making about learning outcomes of the course; Staff development meeting with the curriculum team to give feedback;

Information on who the Project leader is; Information on plans for new equipment and materials; The minutes of staff development meetings be made available to all implementers; Participation in feedback by collecting feedback from students; Participation in discussion of completed s syllabus documents and giving input; Information on the curriculum team's plans for developing resources and teaching materials; Information (in writing) of all major decisions throughout development; Feedback on their own experiences and opinions about teaching the course; Staff development meetings be devoted to any new content (knowledge) (Mutema, *et. al.*, 1992).

2.6.3 Staff Development and Participation

Fullan (1991) has articulated that field research on implementation demonstrates the very integrated nature of collaboration amongst staff being critical. Further elaboration by Fullan *et al*. (1975) asserts that training is supposed to be continuous and not just static. According to the authors training should encompass all the period that entail, before during and after. This is essential in the eventual implementation of an effective programme. Instances in which successful implementation has taken place attest to using a continuous training. Other than the initial support it is imperative that extended interaction amongst peer teachers and other consultants should be enhanced in school. The interaction process should encompass individuals group and corporates being involved in decision making on how to innovate.

Fullan (1993) indicates that innovation is too important to be left to experts only. It is important that teachers be given the role of creating an entity that will be capable of ensuring collective responsibilities, renewal and innovation on programme implementation.

Professional development that is crucial for aiding teachers in implementing strategies that need new skills in teaching or assessment. Ongoing professional development provides a healthy ground for capacity building in order to enhance supportive efforts in the education reforms. This can be achieved through teacher training workshops and seminars. Khan (2011) pin points that teachers should attend the workshops in order to be updated on their professional development. Some of the topics that can be used in the designing of the professional development for teachers may include content, programme philosophy, pedagogy and components of the programme.

2.6.4 Programme Philosophy

The philosophy behind the implementation programme ought to be understood by teachers in order for it to have an impact on students administrators and parents, together whether other stakeholders. This is because through the said curriculum, desired changes in the behaviours of the said participants can be sought and achieved in order to attain the objectives of the programme and its philosophy. Most importantly though the philosophy of the Country at any given time distinguishes the curriculum to be implemented. The philosophy will dictate the subjects' roles and responsibilities, experiences that will be incorporated into the demands that are emerging in the society.

2.6.4.1 Philosophy and the Methods of Teaching

The philosophy employed in the methods of teaching cannot be disassociated from the methods of teaching. It is Philosophy that controls the teacher to change his methods of teaching accordingly. Method of teaching is conditioned by a philosophy of the individual and educational planning. Philosophy can be looked at as a means through which we think and how we work. As a result of the two aspects, determination on the style, nature and the actual operation of the teaching methods will be espoused (Desimone *et al*., 2002).

2.6.4.2 Philosophy and the Teacher

The philosophy that is used in teaching can be used to demonstrate how the teacher applies particular ethical concerns and the reflective way of how they teach. In the realm of pedagogy the teacher is not the only sole entity in class but the only entity in philosophical terms (Dede, 2001). This therefore calls the teacher to be conversant of the material needs of the children and the demand dictates of the society to enable the teacher plan his or her methods of teaching. The benefits in the ideas of the society and

the tenets of the behaviors that should be elicited in order to have an impact on the developmental aspects of the learners.

2.6.4.3 Philosophy of Teaching and Teacher Development

Education is the dynamic side of philosophy. Both philosophy and Education are the two sides of same coin. Every individual is has a specific kind of philosophy, and follows in his life. The debate if the teachers are born or made leads to the point where it may be discussed if professional development programs are beneficial or not. Even if a teacher bears solid intelligence and inborn teacher aptitude he may not be able to choose a well-defined method or a strategy because he is not aware of any such theories (Desimone, 2002).

2.6.5 Content

Teachers are sometimes faced with implementing or initiating a curriculum having a content that they are not familiar with. This happens when they haven't taught the curriculum for some time. Mukan (2016) gives an illustration in which the teacher is expected to adopt a problem solving approach instead of a topical approach. As stated by Battey *et al*. (2016) and MacDonald *et al*. (2016) content instruction will depend upon the quality of explanation that the teachers will offer.

Mohyuddin and Khalil (2016) found a connection between teacher content, knowledge and students achievement. This study was housed in the group of teachers who comprises a powerful content knowledge and the confidence to teach the intended curriculum. The authors mention the misinterpretation of the basic Mathematics learners and established that the Mathematics student's inadequate knowledge of the curriculum could have hindered students' comprehension and continued development (MacDonald, *et al*., 2016: Phillips, *et al*., 2017; Vold, 2017). Knowledge alone is not helpful but updating knowledge is more important in the context of continuous development.

2.6.6 Pedagogy

2.6.6.1 The History of Pedagogy

The teachers' role can be traced in the history of the Ancient Greece way back in the 5th Century BC through Socrates as the fundamental pillars towards the development of modern education. Since then this role has transformed from the time the slaves used to accompany the children to school while the slaves master were busy working on a

professional model. Schools started to appear in England in the year 597 AD. It is believed that the first school must have been established in England under the name King's school of Cantebury, Kent. Just like the other schools, this school had connections with the church though currently its publicly being managed. Regarding the content of the curriculum the history of pedagogy can be used to split the curriculum into two. One, trivium which deals with grammar, logic and rhetoric whilst quadrivium curriculum which deals with astronomy, music, arithmetic and geometry.

During this time lessons were conducted using the formal lecture method with the teacher being actively involved while the students passively read, explained and answered texts. Later on students were provided with texts that they used to debate amongst themselves, thereafter the students will engage with the teachers who had initiated the programme.

Historically pedagogy could be described as a way or means through which a teacher delivers instructions that contain content of the curriculum to a particular class. In a nutshell it comprises the teaching theory, feedback and assessment (Runesson, 2015).

2.6.6.2 Pedagogical Approaches

Pedagogical approaches can be looked at based on four major categories namely behaviorism, constructivism, social constructivism, and liberationist (Runesson, 2015).

2.6.6.2.1 Behaviourism

This pedagogical approach is otherwise commonly known as the traditional teaching style. This approach adopts the theory of behaviorism to inform its approach. This approach centers on teaching and learning being teacher centered. However, this approach is instrumental in the direct instruction and lecture based lessons.

The theory of behaviorism in the classroom set up was proposed by Thorndike (1911), Pavlov (1927) and skinner (1957) under this pedagogical approach provides the teacher with sole responsible authority; who guides and directs the lesson. Knowledge and skills is deciphered in a discretely structured manner contrary to the topic based learning.

Based on behaviorism, the lesson can pedagogically be approved using a complimentary of methods such as modeling, lecturing, demonstrating, oral repetition and rote learning. The named approaches are visible and structured and organized by the teachers. On the contrary, lessons sometimes shift when the Centre of the activities.

2.6.6.2.2 Constructivism

This pedagogical approach is commonly referred to as the dynamic progressive teaching style. As a theory, constructivism lets and enables people to gain knowledge and experiences and reflections. This approach puts emphasis on the child as the central focus of teaching and learning. Unlike behaviorism, constructivism is also referred to as the invisible pedagogy. The varied activities incorporated in this pedagogy includes project work, inquiry based learning, the Montessori or Steiner method. The tenets of constructivism are replicated in the works of (Bruner 1961; Dewey, 1997; Vygotsky, 1978) to name but a few authors.

This approach is a product of pedagogical works of Piaget (1896 – 1890). Piaget 1972 espoused that the schemas commonly known as schemes is the idea that learners go to learn while the teacher is tasked to develop activities that enhances learning amongst students.

2.6.6.2.3 Social Constructivism

This pedagogical approach is basically seen as a fusion of two prioritized agendas namely the teacher guided and student guided priority. Lev Vygotsky who is a cognitive psychologist developed the social constructivist theory upon the work of Piaget, however Lev argued that the ideas of Piaget that learning could only happen in its social context and believed that learning was a collaborative process between the student and the teacher (Vygotssky, 1978).

During the application of the social constructivism lesson the teacher can adopt the use of group work based on smaller group size and also limiting the choice of topics. Modeling of instruction, questioning and a mixture of more than one, two or the class instructions can be adopted.

In this pedagogical approach, students may take the role of the teacher and decide which lesson is to be taught and how. The role of the teacher is to give students opportunity to show case their abilities in learning through performance speech and dance.

2.6.6.2.4 Liberationism

Brazilian educator Paulo Freire is the one who developed this pedagogical approach. When developing the approach he was the director of the Department of education. The major aim of Paulo developing this approach was to enable illiterate to go through their programme in 45 days. In the development of this programme he purposed to eliminate the two major hurdles to learning which were poverty and hunger.

In view of Paulo, liberationist theorizes that students' voice is very important and is the major focus in the classroom which is democratically set. Emphasis is put on having the learner as the instructor and the whole class rediscovering the subjects in one way or another.

2.6.6.3 Teaching, Development and Pedagogy

By highlighting aspects which are negative we end up operationalizing actions that need to be changed. There is a general perception that when teachers rarely reflect on what they are teaching leads to one thinking that he will be doing repetitions of the text book material (Baird *et al*., 1991). Its argued that the styles that teachers use their attitudes and the contexts they adapt is deeply rooted in the teachers working experience and cannot be automatically be situated to all teachers.

In light of this, it prudent that teachers are exposed to new but familiar pedagogical approaches. Teachers are also called upon to work and develop new teaching skills that are synonymous to new programme that involves new values. Cansarano (2015) found out that lack of training or guidance for the curriculum can hinder accurate delivery to students.

2.6.7 Components of the Programme

It's mandatory that for teachers to learn new opportunities in the new programme they will need to acquire new skills and knowledge. For instance when new programme places greater concentration on school based assessment while teachers are more accustomed to the national or continuous assessment

2.6.8 Change

For change to attain the ultimate goal of improving outcomes then it should be involved in adoption of an innovation and a transformation of different practices (Carlopio, 1998). Fullan (1992) assents that, "Change entails a stage wise process of learning new ideas and things. Change refers to the learning that is practical and learning that is innovative. The various changes may be looked at in relation to the possible use of novel or reviewed materials, new pedagogical approaches and the possible transformation of beliefs (Fullan, 1991). Literature indicates that change is not as an event but is a process of change; people in the community and the relationship are the main components to successful implementation. Support mechanisms are required to achieve an improvement in practices and procedures.

Change is needed in the society in order to improve on their work. The penultimate purpose of change is to ensure that there is adequate practice for effectiveness to be achieved. The change in the curriculum implementation can trigger organizational changes especially in the roles and relationships amongst members in the organizations by innovating varied practices. This is what is commonly called the paradigm shift. Robbins *et al*. (2001, pg. 231) assents that factors that are involved in facilitating change can be either external or internal. Credaro (2001) noted that the external forces involved in the change process refers to the globalization of society that has resulted into pertinent and imperative appraisal of various practices that can be used to maintain a competing scenario. Educationally, this can be used to present the need to update practices in keeping with the findings of international research and to continuously conform to the national trends. Internal forces refer to the alteration in schools such as staff and students relationships that provides the need for modification of teaching practices and policies and procedures.

The fundamental position of the learner is amongst the main features or aspects of the implementation of an innovative instructional method. Though the student's expectation is assumed, the success of the programme will rely upon the innovations.

As much as teachers are in control of the activities in the classroom the students holds the onus on what is being transmitted and implemented in the new curriculum can be quite different from the curriculum that is actually implemented. The learner factor influences teaches in their selection of learning process. Teachers need to infuse

education and change, on a periodical basis. This can be done by discussing the descriptions of the activities with the students work on the skills students need to participate in new educational reforms and consider the relationship between old and new. (Fullan, 1991).

There exists a variation in how curriculum innovation charge is adopted by different people. However the common denominator is that it entails something new for the students as contrived by the students (Fullan, 1991). Besides the learner is a key figure in the curriculum implementation process.

There is a culture amongst implementers of new curriculum to sideline the students' role as an agent of change. Very often there is the realization that students who are in the primary level of education, can add to the meaningful change. Students must be ready to engage in the new programme. When upon the students don't appreciate or value the relevance of this programme there comes the eventually of them not being motivated to participate in learn. Regardless of students being involved and its anticipated successful implementation of the programme, the role of students has not been succinctly been explained or described.

Sometimes students are so engrossed in the way they perceive the proposed changes in the new curriculum to the extent that they may not receive the changes enthusiasm. For instance students may have been accustomed to being dictated notes by their teacher and this may change when they are needed to write their own notes. This may impact on the students who may not be in a position to write their notes on their own. Other instances entail getting students to participate in discussion when in the first place they were not used to debating in class given their passive nature.

Whereas teachers are the go link and partial leaders in the classroom they are critical during the adoption and implementation of the new curriculum. The students will influence teachers in their selection of teaching and learning methodology based on students experiences. A case to mention is when the students' socio-economic background and learners' ability can be used to determine what is actually achieved in the classroom. As Nkomo (1995) at least there is need to put in place the varied characteristics of the students in the implementation process. Whatsoever changes that falls place in the education sector should take into account the needs and the interests

of the students. Students' feedback is the most appropriate means of assessing the new teaching method.

2.6.9 Assessment

Assessment that occurs in the form of examination can have on impact on the curriculum implementation. This happens when a lot of emphasis by teachers, parents and school administration places a lot of emphasis on phasing education at the expense of other aspects of the curriculum which may not be examinable. The emphasis on certification may make teachers to influence the achievement of the broader goals and objectives of the curriculum.

Other than the certification of the students teachers should make use of other validated and reliable tools which can be regularly reviewed and revised. Students out to obtain information concerning their school achievement and performance in the shortest time possible and continuously. To top it up schools are duty bound to provide certificates, scholarships towards merited students.

Student's progressive report should be based on the formative and summative assessment that should be analyzed on a regular basis so as to assess whether the assessments are reliably validly presenting the desired goals. The successful aspects of the curriculum can only be shown when the result of the assessment and evaluation of the students' evaluation are ascertained. (Trumbull *et al*., 2013)

As precedence to any evaluation former reports are crucial and very useful. As such external examiners reports can be sourced in order to improve the evaluation process. Results from the examiners are independent thus they form the basis of informing the programme whether the objectives programmes have been met or not.

Polter, Watts and Preslar (2002) have indicated so as to accurately meet the implementation process, programmers need to put their focus on three components: The foundations of the programme, the system implementation and the monitoring of the programme. As Chen (1998) concludes the implementation system intervention will interact provide programme outcomes.

Dusenbury *et al*. (2003) points that evaluation models used for evaluating the implementation systems needs an adopt comprehension of the aspect that can be both internal and external to the programme. Those aspects may include, the behavioral

characteristics of the participant, implementing agency, the mode of delivery and the organization implementing the evaluation, participants external social contexts and the broader societal factors (Chen, 1998). As a result of this we may have factors such as; the implementing agency training programme, the characteristics of the programme, implementing agency characteristics of the programme, implementing agency characteristics and the firm characteristics.(Dusenbury *et al*., 2003).

Though the degree to which the implementing system is evaluated may be altered with the practical consideration such as time and money, the explanatory power of the evaluation will be increased by collecting data regarding as many of the implementation factors as possible. (Potter *et al*., 2002)

2.7 Innovative Methods

These are methods which are becoming increasingly popular and whose main characteristic is the transfer of tasks and roles in the classroom from the instructor to the learner in the student centered approach (Chen 2002). The students is observed and seen as one who thinks and creates knowledge actively rather than passive individual who is reliant on other people's knowledge. Another characteristic is the teaching of students in small groups and in tutorial rooms as opposed to many students in lecture halls (Mutema *et al.*, 1992). Innovative education teaching methods affect the key active teaching in the classroom, students can engage in a vigorous discussion and dialectic, fully show their individualities, break the traditional teaching methods, the new method allow students to attempt to diverge type of thinking, by which teachers and students can discuss progress together in class. (Su Wangchu *et al*., 2002).

These methods include: Small Group Tutorials (SGTS), Small Group Discussions (SGDS), Problem-based learning (PBL), Community-Based Education and Service (COBES), Computer-assisted instruction (CAI), Computer Assisted Assessment, E-learning, Self-Directed Learning (SDL), Independent study, Electives, Case study, Demonstration, Field Study, Role play and SPICES. These aspects are briefly discussed herein in order to understand what each method means, how it is supposed to be implemented and what determines its implementation. This understanding will indicate if these methods are applicable in implementation of Public Health Programme in Moi University.

2.7.1 Small Group Tutorials (SGT)

A tutorial refers to discussions that take place amongst a teacher and a certain number of students.it has been stated that the smaller the number of students that form the group the more efficient the group will be. The number of students that can be represented in the group should be around eight. The ratio should be formed at 1:1 basis. Ngatia *et al*. (2019) warns that the tutorial should not be constructed to be a mini-lecture that is provided by the teacher. But according to the author it should enable the teacher to passively talk and encourage students to think and learn on an individual basis. Although the ideal ratio is 1:1, this may not be practically possible given the numbers of available tutors versus number of students. The ratio of 1:8 is acceptable.

2.7.1.1 Advantages

Several advantages of a small group tutorial have been cited. One, it entails a communication between the students and the teacher by providing personal contacts in between students and teachers

These tutorials present varied activities for the students thus an opportunity for a rather detailed interactive discussion for students to prepare themselves for work.

Students who are not able can have the opportunity of being aided with the teachers by given the full attention that they deserve.

Individual differences can be given full attention by the teachers through immediate feedback.

The tutorials encourage innovation among students through a problem solving approach and self-directed projects among students.

In this method student reflect knowledge in an open system thus provision of questions in the most adequate time.

This method is very effective in changing students' attitude thereby improving students' performance.

2.7.1.2 Disadvantages

It has been regarded uneconomical in terms of utilizing human personnel. In addition it is time consuming as it takes too long to cover subject content matter. It's imperative for students to do prior work on subjects before the real tutorials takes effect. The

method is prone to interruptions the approach doesn't allow for the repetition mode applied while in session. The method is also prone to domination by individual students to the expense of others.

2.7.2 Small Group Discussions (SGDs)

This technique is effective in encouraging students to analyze, do a synthetic analysis and evaluation of knowledge that they acquire especially in higher order cognitive skills.

This technique can be ineffective when teaching psychomotor skills of tonometry but on the other hand it can be appropriate in aiding students to analyze some of the causes of glaucoma (Ngatia *et al*., 2009). The approval can take teacher or student centered format. Singh, Bhavat (1995) examined the efficiency of the discussion method and the traditional method in a Bed level and concluded that discussions is an effective method. The study focused on students who ranged between 5-10 years of age.

A discussion is a conversation about something important. It is an exchange of ideas. Therefore the discussion group should actually be small in size to allow participation of all members to voice their ideas for sharing and critically analyzing them.

2.7.2 .1 Advantages

This technique allows utilization of resources amongst the members of the group. Besides there is a shared objective and commitment among the group members to learning and above all students will assist each other in areas that difficult to deal with.

This method provides learners with the opportunity to interact with the teachers and their colleagues. To this end the learners will be able to actively participate in the learning process rather than be passive recipients of information from one source. The work that is to be done will ultimately be interesting and offer greater motivation for learner to learn.

Students will be equipped with relevant logic of their own and colleagues through self-expression and intercommunication.

This technique offers an opportunity for the synthesis of varied experiences and information that can be found from lecture halls, laboratories, clinics, and readings. The student will be able to internalize the concepts of individualized learning easily with

confidence because mistakes can be corrected by the other group members of the teachers.

Small group discussions facilitate the development of many skills which are emphasized in innovative medical education and these include: Problem - solving skills; Communication skills; Interpersonal skills; Teamwork and Attitude- shaping (Mutema *et al.*, 1992)

2.7.2.2 Disadvantages

There is a challenge of unequal growth amongst the members as a result of a domineering member who can be aggressive vocal and very active therefore overruling non vocal members.

It is time consuming and there is no guarantee that a task can be accomplished within a specified period of time.

Members of the group must have an insightful and in depth research beforehand in order for the discussion.

In the event the group leader fails to plan the group agenda may not be achieved.

The bigger the group the lesser the efficiency of the group.

In a nutshell small group discussions can facilitate the development of many skills that are emphasized in a creative medical education and this includes problem solving skills; communication skills; interpersonal skills; teamwork and attitude shaping (Mutema *et al*, 1992).

2.7.3 Problem - Based Learning (PBL)

Problem based learning is arguably one of the most creative and innovative methods in medical education although not in education. PBL originated in the constructivist theories of learning (Loyens *et al*., 2006). In this learning approach the learners take a patients problem, a community health problem, or a research problem as stimulus for learning. This learning process enables students to develop problem solving skills through acquiring an interpolated body of knowledge that is associated with the problems. Problem based learning may be incorporated in a number of ways in the various medical education areas such as veterinary science, nursing and dentistry (Savin *et al*., 2004). In the model that is used in medical school, students can be put into groups

of seven to ten under the close supervision of the school or faculty member or any other designated lecturer for instance as student who is a graduate or under graduate. There is normally a limited formal class in the PBL. In PBL, students are challenged to learn how to learn according to Ngeow *et al.* (2001). The teaching strategy involves having students work cooperatively in small groups to seek solutions to real life problems and thereby derive understanding of underlying principles and concepts according to Edward *et al.* (2001), and more importantly develop skills of becoming self – directed learners. According to Northwood *et. al.* (2003), teachers in these situations are facilitators, coaches or 'guides on the side' rather than 'sages on the stage'. In order to nurture problem – solving skills among students, the role of the teacher should be to pose a challenging question or scenario to the students. This will stimulate their thinking to come up with a solution, other than suggesting solutions to them.

2.7.4 Community - Based Education and Service (COBES)

This is a method which requires sending students under supervision to environments in which they are expected to work when they when they graduate. It also requires that students be exposed to this as early as possible during their training. Community – based learning has gained momentum as an innovative educational teaching and learning strategy in medical education since the Flexner report of 1910. It is now recognized as an important addition to teaching and learning strategies in medical education (Boaden *et. al.*, 1999).

According to Magzoub *et al.* (2000), community - based education is a means of achieving community orientation. It refers to teaching and learning activities that take place in a particular community for example a community academic centre. Lemp *et al*. (1999), points out that community- based learning focuses the learning activities extensively in the community and students, members of the community, teachers and representatives of other sectors actively involved throughout the education experience. The students are exposed to real life problems since they learn in the context in which they will provide service after graduation. According to Boaden *et al*. (1999), community involves a potential broadening of perspective. However, Larsen (2000) observes that teaching and learning activities undertaken in a community may or may not meet the criteria for community orientation.

A community is a group living in the same place having a common characteristic. The COBES approach may limit the student's understanding of health problems to given localities / situations. In the event that the student gets an opportunity to work in a totally new environment, different from the earlier experience, it may be difficult to handle the challenge.

2.7.5 Computer - Assisted Instruction

As the name suggests, this is a technologically based instruction that enables the utilization of the computer based knowledge and technology in the teaching and learning process. These assisted instruction many at times refers to the intense rote learning simulation that are offered by tutors or as complementary to the traditional, common teacher directed instructions (Ryan *et al*., 2000). Many students agree to the fact that it is enjoyable when working using computers. This is because computers cannot be equated to patience besides while working with computers students don't tire easily, they won't get frustrated or be angry the computers allow students to work privately; computers are also fun working with because you can entertain yourself. There are many prospects of personalized individualized learning. One can gauge the pace you want to adopt computers being passive cannot report the mistakes committed by students. Computers are also liked by students because they allow one to experiment with different methodologies. Unlike teachers the computers can give instant feedback and they are objective as opposed to the subjective nature of trainers. Computers are also neutral in the sense that they don't recognize race or ethnic background. Computers are liked by students because they can give a sense and touch of control over learning. They can involve all the senses other than taste only. Through the various features that are in build students can be able to correct spelling mistakes and build competence. Most importantly computer can offer means to which you can be able to draw, draft graphs and work rapidly-closer to the rate of human thoughts (Clariana, 1993)

From the foregoing one can say that they are computer managed instruction (CMI) that can be used in school to organize data and aid in decision making in which the computer evaluates students tests performance guides them to appropriate instructional resources and keeps records of their progress.

2.7.6 Computer Assisted Assessment

This is an assessment that is made possible by the computer. As Brown *et al*., 1997 posit, assessing students is a fundamental aspect in the teaching and learning process of the learners. According to the authors, there is significant pressure to ensure that higher institutions of learning evaluate learners in a formal set up this according to Farrel (2002), Lauvillad (2002) can be interpreted to in lie continuous or regular assessment. The information and communication technology (ICT) potential that can be used to automate components of teaching and learning are enormously acknowledged. However, as noted by Conol (2004), Connol *et al*. (2004) this potential has been slow in its implementation.

The computer assisted assessment (CAA) has great merits and strength in easing the assessment load by providing innovation and very important modes of assessment (Brown *et al*., 1997; Bullard McKenna, 2004) Literature indicates that with the continued use of ICT challenges inherent with its usage may be felt.

Bull *et al*. (2004) defines CAA as the application of the computer in the assessment of students learning. Computer based assessments can take varied forms that may include marking of answers or ready in build in the computer application or marking of scripts through the optical mark, machines that marks original answer scripts.

Many disciplines in both social arts, medical and science related fields have adopted CBA to provide a formative feedback and offer summative assessment Clariana (1993) opines that computer based assessments can be used to produce improvement in the students learning outcomes and that this can lead to a positive attitude towards student's learning.

CBT can be monitored through supervision or non-supervision additionally it can be used for a diagnalistic formative or summative assessment. These functions can be carried out using distance learning or locally using intranet or home networking.

Varied strengths and weaknesses for CBT have been outlined by Piat *et al*. (2002) to include the following: -

2.7.6.1 Administrative Advantages

Computer based assessment does not have errors commonly referred to as human errors this is effective in saving time and human resources. Whenever tests are to be reedited then the cost of printing may be saved significantly.

2.7.6.2 Administrative Disadvantages

This system can be costly and time consuming during the implementation stages especially when one has to integrate it with an institutions MLE personnel to manage CBT will need pre-training in how the programme should be designed and programme to run. This means that more financial resources will be used.

A lot of coordination is required for all the stuff who are involved in the designing and implementation of the CBT. Some software cannot run marking that as invisible. A lot of robustness is needed so as to ensure that the CBT does not run into failure or a slow runs.

2.7.6.3 Pedagogical Advantages

Lectures can integrate a hint into a question. The tutors will monitor the status of the students' overtime during the use of this assessment. On the part of the student the system can provide feedback to the student making them to have tabs on what is happening or changing according to their process. Students will receive a spontaneous and detailed report on how they performed. Based on the test result of the new teaching methodology to suit the needs of the students. The feedback can also provide a solution to problems impacting a certain programme or course.

2.7.6.4 Pedagogical Disadvantages

If not well supervised this system can be prone to copy and paste as it is difficult to ascertain the students' identity. The learners need to have knowledge and skills in it. The staff has a tendency to just use MCQs which can be involving, demanding and non-incentives diagnostic and it can be released very easily to the students.

2.7.6.5 Other Advantages

Timely feedback: the teacher can provide feedback; Automatic feedback. Some forms of online assessment answers (multiple choices); Monitoring and tracking of learner's results behavior; Choice of assessment modes such as multimedia and inter activities. Time saving; an assessment can be created using software tools and adapted and reused as needed. They can be distributed and collected using a web based system which saves

development distribution; Reduces resources needed by replacing human resources with Computer resources; Reduces turn round time. As the system enables Assessment to be collected by Computers; Keeping record of results that can be stored centrally and assessed by interested parties, such as students and staff; Increased ease with which data can be used as collected assignment and stored electronically can be analyzed easier and the data can be used in spreadsheet and other statistical packages; Flexible and comfortable environment.

Online tests afford students the opportunity to take tests on their own terms; Time consuming grading can be done by Assessment software; Once taken and graded can be reconfigured for multiple attempts providing for practice; Computers are more accurate at scoring selected response tests than human being are; Computers are more accurate at reporting; Computers can give immediate feedback; Diagnostic feedback can be provided very quickly to each student on those items answered incorrectly if that is the purpose of the test (Livingstone, 2012).

2.7.6.6 Other Disadvantages

A high level of organizations is required across all parties involved in Assessment (academic, support, staff, Computer services and administrators); Assessors and invigilators need training in Assessment design, IT skills and examination management; Hardware and software must be carefully monitored to avoid failure during examination and students require adequate IT skills and experience of Assessment type; Construction of good objective tests require skills and practice and so is initially time consuming and because of this testing of higher other skills is difficult; Computer anxiety; Differences in the degree to which students are familiar with using Computers; Technical malfunction; computer equipment may not always be available or in working order; Cheating will arise; Absence of instructor; instructor is not in demand when has a question about a problem or when a student maybe confused by the language of the problem.

2.7.7 E-learning (electronic-learning / online-learning)

Refers to a learning system that can be obtained through the internet using an electronic device. Online means with an internet connection or via the internet. This is distance learning mode enhanced by use of computer technology.

Electronic-learning platforms include: Massive Online Open Courses (MOOCs); Virtual Learning Environment such as learn or blackboard (VLE); Video streaming services such as YouTube; Virtual instructor –led training (VILT) e.g. WebEx, Webinars; Forums; Podcasts; Discussion (Trumbull *et al*., 2013).

2.7.7 .1 Advantages of Electronic-Learning

Several people can receive educational material simultaneously; People can study without having to physically go to a learning institution i.e. without learning home or work place; Cost effective and Saves time.

2.7.7.2 Disadvantages of Electronic Learning

Online students feedback is limited; E-learning can cause social isolation; E-learning requires strong self- motivation and time management skills; Lack of communication skills development in online students; Cheating prevention during online assessment is complicated ; Online instructors tend to focus or theory rather than practice; E-learning lacks face to face communication; E- learning is limited to certain disciplines; E-learning is inaccessible to the computer illiterate people and Lack of accreditation of quality assurance in online education (Rakes *et al.,* 2015).

2.7.8 Factors that have contributed to the Popularity of E-Learning

When the internet was first started, people were skeptical about this type of education. However, as technology and learning systems improved, studying online became more popular. Today millions of people study online all over the world. Learning institutions have replaced physical books with digital content that students can easily access on their electronic devices. The following factors have contributed to the popularity of e-learning (Peat *et al*., 2002).

2.7.8.1 The Internet

The rise of the intern*et al*lowed organizations to abandon one dimensional practice and utilize the flexibility of e-learning.

2.7.8.2 Development of Multimedia

As E-learning progressed, the ability to integrate elements such as images, videos, audio, and graphics proved to be a more reliable way of keeping learners engaged compared to traditional learning.

2.7.8.3 Affordable Digital Devices

E-learning popularity rises as digital devices become more affordable.

2.7.8.4 Well-built Learning Management Systems

LMS's have become more sophisticated, moving from locally installed to cloud based systems.

2.7.9 Independent Study

This is where students master the area being studied, while at the same time they develop the ability to work on their own and to take responsibility for their own learning. Besides, this learning conducted by learners with minimal support from the teacher. This promotes the aspect of independent minded students.

2.7.10 Individual Learning (IL)

This is also referred to as self-directed learning. The basic assumption for this method is that students know themselves best and can, therefore, determine their needs and seek guidance whenever they need it. Learning for the sake of one's own knowledge by conducting research, reading articles and books, or employing other platforms is termed as self-learning or self-directed learning (Bransford *et al*., 2000).

This kind of learning has several advantages including the following; Students can select one's field of study, work at their own individual pace, can learn at the time and place of their choice; Students can request teaching whenever necessary and students can omit any parts they already know; Teachers can prepare a standardized body of information and Students are exposed to a standardized body of information; The method can provide for creativity and independent thought on the part of the student and it can help achieve the desired competence; Students have the privilege of assessing their own performance, enabling them to rate themselves, figure out where they went wrong, and take the required steps to rectify their errors It takes into consideration students' individual differences and can provide immediate feedback to the teacher (Mello *et al*., 2014).

On the other hand, this method has some disadvantages like being an uneconomical way of using resources and takes time on the part of the teacher to prepare materials for individual learning; It needs administrative staff; Information usually comes from a single source and may be a one-way learning process and there is no teamwork and no

inter - personal relationships between students. Although students are individuals who understand themselves better, when it comes to learning, one cannot be self- sufficient with knowledge. There will always be a gap that may require to be filled by someone else's experience. Hence the need for self- directed- guided learning.

2.7.11: SPICES

This is an instruction strategy that refers to Student - centered, Problem based, learning integrated approach, Community-based Education and service, Electives and Systematic Approach as proposed by Harden, (Harden *et. al.*, 1984).

2.7.11.1 Student- Centered

In student - centered learning, what the student learns matters, rather than what is taught. Students are given more responsibility for their own education. Students spend different amounts of time studying a unit depending on their learning needs, abilities and interest. Feedback is given to students and further studies are organized to meet the student's needs and interest. This mode of instruction requires of the instructor to prepare the learning materials tailored to meet the needs of the learners.

2.7.11.2 Electives

A method of teaching which allows students to identify areas of learning which are of interest to them and then supporting them to realize set goals. It is no longer possible for students to study in depth all topics in the curriculum (Ballimore, 1998). Electives are forms of Special Study Modules (SSMs) or similar strategies where students are given opportunities to study areas of their particular interest concurrently developing skills in critical appraisal, self-assessment and time management. This is an enrichment option in learning. Harden *et al.* (1984), argue that the most important out - come of an elective is often the change of the student's attitudes towards their studies and professional practice. This is a good strategy that develops from broad to narrow. It fosters specialization which allows for in-depth understanding of a chosen study area. Students are more motivated to learn when they are interested in the subject matter.

2.7.11.3 Systematic Approach to Teaching and Learning

This is the last component in the SPICES teaching and learning orientations. As Kimeu (2002) puts it from literature review, Systematic approach requires students to receive essential components of the course, list of skills and competences to be mastered and list of conditions they are expected to see and examine early in the planning of the

programme. In systematic approach students keep a logbook or portfolio of the clinical experiences as they rotate in all selected thematic areas. All Students rotate in these areas as a learning strategy.

Harden *et al*. (1984) favours a move towards systematic approach in curricula development and implementation of teaching and learning when they point out that students' experiences are enhanced as they interact with a variety and range of health problems. Competencies are rationalized as students identify which competencies are useful and necessary as guided by the teacher. Time is well utilized as students do not need to spend time in areas in which they are already competent.

These Innovative Instructional Methods enhance individualized learning but at the same time deny the student the benefit of group learning which promotes interaction.

2.7.12 Field Visits

Courses for health professionals often include field experience. In this case students go away from the training school to actually do the work for which they are being trained (Shojaeezadeh, *et al.*, 2018).

2.7.12.1 Advantages

It provides the actual situation in the field; something that cannot be learnt in school. Students can observe and /or participate in the use of theory through first-hand experience in an actual field situation. It provides a situation for creative and independent thought on the part of the student. It provides an opportunity for developing interpersonal relationship between students, teachers and field staff. It can help promote the desired competence and attitudes. It provides time for questions and discussions. Information comes from multiple sources.

2.7.12.2 Disadvantages

It is not an economical way of using manpower and resources. If it is not well supervised it might become just like a picnic; It creates an administrative problems in arranging programmes; It may confuse students because there is a usually a wide gap between field practice and academic theory.

2.7.13 Demonstrations

This is a strategy in which an instructor instructs through presentations of procedures, stages or steps to a group of individuals in a particular setting. Traditionally this method

is disadvantageous in which the teacher is the active provider of knowledge while the student is the passive receiver of the same knowledge.

2.7.13.1 Advantages

Economically, it provides a means in which the human personnel and the other material resources can be utilized especially when these aspects are in limited supply.

Students are in a position to understand the subject matter effectively through the demonstrations that they can be able to see in the class. This method provides a two way interface of information through the audio and visual.

This strategy is effective in pacing students work rate. It gives a platform in which the students can be able to reproduce an assignment in a more organized manner. Within a short period of time a student can be able to reproduce quite a broad spectrum of knowledge.

2.7.13.2 Disadvantages

It provides a one way teaching and learning process in the instruction room. As indicated earlier, students' passivity is on the high level in this method. Students don't engage in any activity that may make them active. In terms of repeating a particular aspect of teaching, demonstrations are not well placed to do this. It is a play on mode that cannot be rewound for clarification.

In terms of feedback, the instructor is not well placed to receive the feedback instantly.

Unless learners are provided the chance to participate in the demonstrations, it will be difficult to assess the learners competence.

2.7.14 Projects

A project can be referred to as a mission or obligation that is given to students individually, or students who are provided or in a big group to perform out a particular task independently outside the classroom jurisdiction.

It is upon the students to organize themselves and implement the project by submitting an approved report to the teacher. Projects vary in terms of difficulties ranging from simple projects that can be done within a week to projects which may be complex that may run for more than one month exam ending up in one year.

2.7.14.1 Advantages

Projects provide a chance for students to showcase prowess in different abilities that they have. The product that is implemented produces a feedback on students' progress to the instructor. The project provides opportunities for interpersonal interaction among students.

This strategy is essential in providing learners with the opportunity to learn at their own pace. It gives a platform for students to engage from the same department.

2.7.14.2 Disadvantages

Projects are time consuming and some can bring about administrative or logistical aspects when preparing the programmes.

Most of these projects end up being incomplete especially when students are not given sufficient time to carry out the project. This may end up making the students to do substandard projects.

2.7.15 Role Play

This is an old method of teaching but increasing in popularity hence its inclusion among innovative medical education methods. Depending on the objectives of a session, a tutor or students, assign each other different roles. By acting out these roles, students learn various correct functions and responsibilities intended for the session. Active participation and team work are among the major benefits of this method. Clear statements of the goals and objectives of the sessions are however necessary.

2.7.16 Competence Based Learning

Though an ancient method of teaching, it has gained popularity in the recent times hence its inclusion as an innovative method in medical instruction. Tutors normally assign different roles to the students based on the objectives of the lessons. Students will afterwards be called upon to dramatize these roles by performing the functions and responsibilities inherent in these objectives. This method has been touted to give active participation to the students and also encourage teamwork amongst learners. However for this to be achieved successfully it is essential that proper guidelines and instructions are given beforehand. Emphasis in competency based learning is on how learners are going to perform in regards to the broad knowledge, attitudes, skills and the appropriate method of professional training.

2.7.17 Supporting Clinical Learning with Logbooks

Undergraduate students together with postgraduate students use clinical logbook in order to support teaching and learning. This method provides learners and instructors with a record of their achievement and progress in various and disciplines and subjects that they are undertaking. These records may entail observations and the tasks that were undertaken. Students in the process of using this strategy will be able to safe keep the record in order to trail their progress . It is however prudent for the instructor to have a supervisor who will be required to sign off the record. Though the logbooks are the manual analogue papers that are used to record the activities Mackway- Jones *et al.* (1999) posits that there are computer based applications that have been used to record the activities.

The logbooks give students an opportunity to keep track of the involvements that they have engaged in. Thereafter an instructor can conduct an assessment of the progress against a marking scheme that is provided in the logbook. Instructor may indicate that they have checked and observed a procedure such as lumbar puncture or maybe they have attended to a diabetic patient. In regards to observation, students are sometimes seen not to be competent in making successful self-assessment due to incompetence and unless strictly guided and supervised the logbook will not be able to demonstrate the acquisition of skills.

As Raghoeber-Kreiger *et al*. (2001) noted this strategy is limited in terms of inter-observer agreements in the logbook records. As the authors noted in a case students in conjunction with two experienced and competent doctors were given similar guidelines and instructions to record observation of a disease that they had encountered for 28 days period. The analysis showed a great variance in what the students reported as compared to what the doctors indicated. Thus, as highlighted the logbook may not be good litmus to indicate student's experiences.

Further evidence from Newble *et al.* (1999) indicated that clinical logbook were not as promising as they were first imagined in terms of motivating students directed learning. The authors reported that students perceived the logbook to lack adequate insight into the fundamental learning activities thereby making impossible for them to adjust into their experience. EC (1993) has revealed that there are wide variations amongst students as regards clinical settings.

2.7.18 Case Study (Design Thinking)

In this strategy instructors normally choose or rather select cases that are medical in nature and use them as a focus for the study. The students will be required to read the cases ineptly, synthesize the cases and analyze the cases. Later on the students will be mandated to make conclusions that will include suggestions and recommendations based on the merits of the evidence they gathered in the case files. Several skills inherent in these methods are developed by the students. These include problem solving skills that entail information searching skills among other skills. The essential concept of the design thinking is that students will be able to study and acquire knowledge that will expose them to real life problems or case analyses using procedures like group interactions (Vlueten, 1997).

Cases are normally sampled in order to be advantageous to the outcomes that are generated in theories. From this the learning outcomes will be effectively achieved.

2.7.19 Illustrated / Overview Lectures

In innovative medical education lectures are to be over- view and spanning the major areas of study. As little time as possible is spent on direct lecture, with opportunities sought to interact with learners whenever possible. Use of handouts, posters, charts and other audiovisuals are encouraged in order to provide illustrations for topics being addressed.

2.7.20 Traditional Instructional Methods

Lectures are seen in the medical education as an overview method innovative instruction. In most cases little time is utilized during direct lecture. The tutors are normally faced with the task of looking for opportunities to involve learners whenever it calls. During lectures, other modes and methodologies that include handouts, charts, audio visual resources, posters and flip charts are adopted in order to provide illustrations for the topic being taught.

2.7.20 .1 Lectures

This is a lesson that a teacher presents orally with very limited student participation if any. Lectures can be presented in a printed form. Non student performance is described as the main tenet of the lecture method in ancient traditional form. Ngatia *et al.* (2009) outlines several merits and dements of the lecture as a traditional instructional method

2.7.20.1.1 Advantages

The staff can effectively utilize time. A broad spectrum of concepts can be deciphered within a short period of time. It is spot on in terms of providing new knowledge and skills.

Lectures can be used successfully in the event books in short supply. This is possible because lectures can engage materials that are unavailable in the books.

Students can be afforded with more time for reading. Lectures can be effective in introducing subjects lectures are enthusiastic in terms of inspiring students.

2.7.20.1.2 Disadvantages

It is a one-way learning process in which students are just listeners. There is no active participation by students or practice of what has been learned.

It is relatively ineffective for changing attitudes. It pays little regard to individual differences of students.

It does not provide immediate feedback to the lecturer. It does not encourage creative activity on the part of students.

It is not capable of helping to achieve all educational objectives. The students tend to regard knowledge as a closed system.

It cannot provide necessary repetition. It cannot teach the skills to be acquired by the students. Students' rate of learning declines as the lecture proceeds. It does not provide for teamwork. Information comes from a single source. It usually provides little time for questions.

2.8 The 21st Century Innovative Instructional Methods

Learners are passive by standers who are not able to participate actively in the teaching and learning process.

Lectures cannot incorporate stimulus variations modes thus impossible to alter attitudes and students individual differences.

There is lack of creativity during the teaching and learning process and feedback is also a problem. Students view lectures as a closed knowledge system that is not open to criticism.

Clarifications are difficult to be achieved in this method.

2.8.1 YouTube

Burke *et al*, (2008) opines that YouTube provides an innovative video technology plartform that can be very relevant in terms of providing supplementary content to students. This, according to the author provides a classroom community that is bound to enrich the learning environment in order to prepare future educators in the medical education field, and then it is imperative that modern and new methodologies are adopted in order to inspire the students. The authors also cite that YouTube is effective in medical health education.

2.8.2 Simulation

Taibi *et al.* (2014) have indicated that though simulation has increasingly become common, most of the educators are not well trained to handle this strategy. In addition, strict guidelines always deter teachers from using this method.

2.8.3 Smart Mobile Devices in Social Net-work Based Health Education Practice

In a study, (Wu TT, 2014) a tablet PC (Portable Computer) and Google+ were introduced to a health education practice course for elucidating capacity and conditions and analyzing the sequence and the frequency of learning behaviors during the social network-based learning process. On the basis of its results, the social network can promote and improve interaction among peers and between professors and students. In addition, all participants in the study including students and educators expressed a positive attitude and satisfaction related to these innovative teaching methods. Nowadays, most of the people have smart mobile devices and spent many times using smart mobile device. According to the importance of social networks, this innovate method is recommended for teaching college health education course.

2.8.4 Patient Feedback by using Patient Perception Questionnaire

In this strategy, a questionnaire developed for patients is normally distributed as they visit facilities. A case to mention is by Boartlett (1984) and Falvo (1980) which indicate

that 588 questionnaires were distributed to patients in a span of 10 months. The conclusion from the survey is that the patients responded well.

2.9 The Top 10 Characteristics of a 21st Century Classroom

Dede (2001) opines that there exist numerous characteristics that distinguish the 21st century classroom to that of the past century according to Dede. This includes:-

2.9.1 Student-Centric

In these classrooms, students play an active role in their learning and teachers serve as mere guides. They are more facilitators of learning than lecturers. They help students think critically and learn by doing and act as a resource while their students discover and master new concepts. Student-centric classroom environments put students' interests first and are focused on each student's needs, abilities and learning styles.

2.9.2 Computing Devices

Computers are readily available in modern classrooms, since they are essential tools for 21st century students and replace the utilities of pen and paper. They not only give students the means to conduct online research and master the technology skills they need, but they also give teachers the opportunity to enhance their lessons (Budin, 1999). The ability to deftly operate a computer is a critical 21st century skill. Computing devices greatly assist in teaching and learning and make them more engaging and effective.

2.9.3 Active Learning

In modern classrooms, students are actively engaged in what they learn. Students participate in more active learning by working in groups or on computers and complete projects and other interesting activities that help them discover new skills. Students can learn actively by talking and listening, writing, reading and reflecting. When students are encouraged to take an active interest in learning, they are more likely to retain the knowledge they've accumulated (Wiske, 2001).

2.9.4 Adaptive learning

Any classroom will always have students of different types of learning abilities. This often makes it difficult for teachers to make sure that all of them understand the concepts equally. The modern approach of adaptive learning gives students the freedom to learn at their own pace and in the way they are most comfortable with. There

are various kinds of software available for adaptive learning that teachers can use to enhance the learning of their students (Dede, 2001).

2.9.5 Invitational Environment

The classrooms should not be cramped or overcrowded. Modern classrooms should have the basic material required for teaching such as, interactive whiteboards and LCD projectors. The BYOD (Bring-Your-Own-Device) approach can be adopted, so that students can bring their laptops or tablets to the classroom for better personalized learning. Teaching with technological material is more effective, stimulates student engagement, eases the work of teachers and makes it easy for students to focus on learning **(**Wiske, 2001).

2.9.6 Students Understand and Follow the Rules and Procedures

The learning environment is carefully planned and well-organized. Class rules, procedures, and notices of upcoming activities are posted in convenient places to help students stay on track. Students are constantly encouraged to remind them of their goals and responsibilities. They follow class routines and understand what they are expected to achieve each day and how they are to go about it.

2.9.7 Mutual Respect

Teachers and students should always have respect for each other. As the new role of teachers is no longer to be the sage on the stage, students should not forget their value as they will always receive guidance from them. Also, teachers should encourage students to speak with confidence and value their opinions. In a well-disciplined environment, students should also co-operate with and respect their classmates.

2.9.8 Students take Responsibility of their Learning

As students are encouraged to actively participate in their own learning, they become responsible for their learning. Self-directed students not only encourage each other, but also work with their teacher to achieve academic and behavioral goals that they themselves have helped establish. Teachers should employ a variety of strategies to promote responsible decision-making and create self-reliant students.

2.9.9 Performance-Based Assessments

Regular performance-based assessments are carried out by teachers through various methods which are not restricted to tests. These can be by conducting quizzes and polls.

Teachers can utilize projects as well as other products and performances as assessments to determine student achievements and needs. Assessments are tailored to the abilities and needs of the students.

2.9.10 Collaborative Learning

Learning through collaboration is one of the most effective forms of learning. Teaching and learning in isolation are very restrictive and hinder progress. Learning in groups enhances the scope of learning and develops critical thinking. Collaborative learning activities include collaborative writing, group projects, joint problem solving, debates and more (Bruce, 1989). Collaborative learning redefines traditional student-teacher relationship in the classroom.

Technology plays a big role in developing all of these characteristics for modern classrooms. These classrooms enhance the learning experience and better prepare students for higher education and workforce (He, 2001).

The application of innovative learning methods and experiences require the teacher to apply teaching skills.

2.10 Teaching Skills

These are tactics used to enable the facilitator carry out their instruction. According to Mutema *et al*. (1992) these skills are: Facilitating the learner to learn by providing necessary learning materials; Advising the learner on important issues like on area of study specialization; Guiding the learner to make appropriate decisions by steering students in the right direction; Informing the learner of important facts or processes; Participating in the learner's learning process by establishing a strong rapport with them to motivate them to learn; Withdrawing from the learning scene to give the learner an opportunity to direct his / her learning. The facilitator should take a back seat occasionally and allow students to discuss or research.

There are a number of traits required of the innovative lecturer which include humility, courage, impartiality, open-mindedness, empathy, enthusiasm, judgement and imagination (Hare, 1993).

The following are recommendations for teachers who would like to engage in Instructional innovation as highlighted by (Chen, 2002).

Updating the teaching concept is the prerequisite of instructional innovation. Concept is the guidance of action. Therefore, instructors have to update their concepts and create new teaching models to meet the demands of innovation. Only when the concept of education has been innovated, can new instructional models be created.

The innovation of teaching content is the key to a successful instruction innovation. As the teaching content will keep changing with the development of modernization, instructors have to keep improving their teaching abilities; only by doing this can they adapt their teaching abilities to the changes and development of education and thereby meet the demands of their students.

Teachers' professional ethics is the motive of instructional innovation. Whether a teacher has good professional ethics will directly influence the quality of that teacher‘s teaching. Being responsible to his career and the quality of his teaching is the basic professional ethic a teacher should have. Treating students with more respect, devoting themselves more to teaching, and thinking more about problems encountered are the ideal goals and inner motives for teachers, as well as the driving force behind instructional innovation.

The good professional quality of teachers is the foundation of instructional innovation. In the teaching process, teachers should seriously study the content of teaching materials and bring them into full play; furthermore, they should create personalized teaching methods, emphasizing the importance of ethics and reality, training students to solve problems with the theories they learned, and improving teaching methods, to best meet the instructional needs of all varying abilities and learning levels.

Innovating the form of teaching is the starting point of instructional innovation. Counseling is an important form of teaching that helps students accept instruction. To heighten students' interests in learning and improve their study effect, teachers have to create new teaching styles, broadening their thought parameters, and bringing knowledge, vividness, interests, and practicability into the classroom.

Developing an all-round education is the main goal. Therefore, it is essential to provide students with a comprehensive education that includes good developmental

opportunities, interpersonal skills, training opportunities that help cultivate students' rational judgment and personal expression abilities, their sense of objective observation and creativity, and perceptual abilities of caring and sacrifice. Only through these crucial improvements to instructional innovation can students have good ethics and a healthy temperament, and become solid individuals with professional knowledge, skills and open minds.

2.11 The Context of Learning

The context of learning influences how students are developed to learn how to learn. Cognitive psychology highlights the importance of learning in the context in which the professional practice will be carried out. It helps in retention and recall of important and relevant information making it useful for application.

According to Schmidt (1993), acquisition of knowledge is indeed an active process, and that learning in a relevant context enables more efficient acquisition and better retention of knowledge. The more a situation in which it is applied, the better the performance of the learner. According to psychology, when new information is stored in the brain, information about the context is stored simultaneously. Retrieval of this information is helped by the context cue. Constructivist theory also explains that students construct knowledge, which they can retain and recall for future application if learning is conducted in the context in which they will work or use in future (Bransford *et al.*, 1999). 'Experiential' learning as explained by Kolb (1984) emphasizes the context of learning to which is relevant in developing key skills in health professionals. It is important therefore that a learning environment is conducive, if possible made to be similar to a real work environment. This necessitates the need for students to be exposed to laboratory / practical sessions, field work and community service, hence the concept of innovative instructional methods of teaching.

According to Falk – Nilson *et al.* (2000), the context of learning is seen in the various aspects of a learning environment that are important in implementing a curriculum. Some of these aspects are the socio – economic environment, the cultural setting within the school and the content of the curriculum. In higher education, these aspects should operate harmoniously in order to provide a learning environment where development of relevant skills in health professionals is strengthened.

The learning environment strengthens skills by giving students support and opportunities for practicing them. Oerman (1994) believes that the goal of professional education is to ensure that students learn, handle ambiguity, think like professionals and develop a sense of responsibility. This will be enhanced if an educational programme for health professions is implemented with the context of learning in mind. The current study sought to determine how the context of learning influences effectiveness of the implementation of Public Health Programme for preparing health professionals.

2.12 The Role of Instructional Media in Implementation of Innovative Instructional Methods

Media is defined as "all means of communication, whatever its format" (Kafu, 1976; Reid, 1994). With respect to education, *media* are the symbol systems that teachers and students use to represent knowledge. Instructional media refers to materials for teaching and learning. This encompasses all the materials and physical means an instructor use to implement instruction and facilitate students' achievement of instructional objectives (Randy, *et al.* 2003). Therefore, for any instructional process to meaningfully take place, instructional media are necessary and must be component of this process.

2.12.1 Types of Instructional Media as Proposed by Kafu (1994)

Instructional media are classified on the basis of;

i) **Origin / nature**; Real Objects, Models, Electronics.

ii) **Human senses**; Visual media materials, Audial, Olfactory, Tactile and Taste materials.

iii) **Time frame**; Traditional and modern innovative media.

iv) **Use**; Projected materials and Non – projected materials.

Other media materials are resource centres, skills laboratories, theatres and human resource which encompass the above four.

2.12.2 Media Portfolios

A portfolio is a collection of student work that illustrates growth over a period of time. Portfolios often include such media as student produced illustrated books, videos, and audio – visual presentations. Use of Portfolio is a good way of developing and accessing the students cognitive, physchomotor, social and even emotional skills.

2.12.3 The Assessment Portfolio

Many educators who feel that standardized assessments and conventional paper and pencil assessments are frustrating are having students demonstrate their achievements by compiling portfolios of their work. The idea of portfolio assessment is to measure students' achievements by their ability to create tangible products exemplifying their accomplishments in terms of analysis, synthesis, and evaluation. The rationale of many educators is in what that assessment of portfolios gives a truer, more rounded view of a learner's strengths and weaknesses (Heinich, 2002).

Portfolio assessment and peer marking promotes self-directed learning and improves the quality of student learning. According to Cole (1995), the greatest benefit of portfolio assessment is to allow students to assume greater responsibility for their learning. Belanoff (1994) states that this modality of assessment motivates students, provides them with feedback, is diagnostic in that it shows students their strengths and weaknesses and finally sets the student's level of attainment at the end of any given course. This is an accepted innovative assessment tool and a way of learning that is utilized in South African education (Cole, 1995).

Students are tasked with collecting, analyzing and select representative samples of their work which are relevant in their course for evaluation purposes. They compile, maintain and submit a personal portfolio according to prescribed guidelines, accompanied by a reflective short essay of roughly 500-1000 words along with their portfolio. The items in the portfolio that they create in the course of the semester, includes what is learned in theoretical lectures as well as practical classes and in some cases during Work-integrated Learning (WIL) which is often over a six month period in industry.

The created portfolio which is labour intensive, makes learning visible. Students collect and assimilate the required work and prepare the evidence of work done and then receive feedback from the lecturer. In many cases, parts of a portfolio may be peer-

marked. The written evidence they present for evaluation speaks volumes about the students' deeper understanding and improved critical thinking skills (Zubizarreta, 2009).

Some of the components of the portfolio could include evidence that research skills are improving, reviewing of academic articles from predetermined academic journals or popular journals is enhanced. Much creativity and innovation is required by students who demonstrate their understanding of their course content. The lecturer must however be careful not to overload the students and provide useful feedback.

2.13 Benefits of Incorporating Instructional Media in Innovative Instructional Methods

The benefits of incorporating instructional media in innovative instructional methods include the following:

The role of media for instructor-directed instructional situations is for supplemental support of the live instructor in the classroom. In other words, media is used to enhance the live instruction. It is most effective when the instructor explains the media and relates them to instructional objectives. In this method an instructor relates and disseminates information to learners. This takes shape in the lecture format, educational television, and various computer formats of instruction.

The concept of advance organizers has developed and is intended to create a mindset for reception of instruction. Advance organizers can help ensure that media play an appropriate role as a supplemental supporter of instruction (Carpenter, 2003).

Easy to access course materials: Course material on a website allows learners to engage in asynchronous learning and study at a time and location they prefer and to obtain the study material very quickly (Lee, 2011).

Student motivation: According to Reiguleth, (2012), who studied the effectiveness of computers used for instruction, students usually learn more in less time when receiving computer - based instruction and they like classes more and develop more positive attitudes towards computers in computer-based classes (Lee, 2011). Students are more motivated to learn when they are interested in the subject matter, which can be enhanced by using new modern technologies in the classroom and targeting the need for screens

and digital material (Reiguleth, 2012) that they have been stimulated by outside of the classroom.

Using on-line resources help students spend more time on specific aspects of what they may be learning in school while at home. These on - line lessons allow for students who might need extra help to understand materials outside of the classroom. The Internet has unlocked a world of opportunity for students. Information and ideas that were previously out of reach are a click away. Students of all ages can connect, share, and learn on a global scale.

Using computers or other forms of modern technology can give students practice on core content and skills while the teacher can work with others, conduct assessments, or perform other tasks (Lai, 2008).

Studies completed in "computer intensive" settings found increases in student-centric, co - operative and higher order learning, students writing skills, problem solving, and using technology (Bransford, 2000). In addition, positive attitudes toward technology as a learning tool by parents, students and teachers are also improved and easily adopted.

Instructional media are useful instruments for unifying and integrating cultures of peoples. They have no cultural barriers and boundaries. They can be used across cultures (Kafu, 1976). The most common use of media in an instructional situation is for supplemental support of the instructor in the class room to enhance learning (Heinich *et al*., 2002).

2.14 Challenges of Instructional Media Use In Innovative Instructional Methods

Challenges of instructional media include Rising Digital Media Development Costs, Advances in computer Technology, Incompatibility, Network, Expertise, Special needs, Space, Time, Complex Media partnership, Dynamism and Emerging issues in Education (Heinich *et al*., 2002).

2.14.1 Rising Digital and Implementation of Innovative Instructional Methods Media Development Costs

Generally, development costs grow parallel to the growth of digital media in order to support multiple learning environments. Digital media designers and programmers are

in high demand and, therefore, expensive to hire. Understanding operations of instructional media programmes and designing curriculum are costly to effect; media development requires adequate investments in terms of finance, expertise, logistics, infrastructure and technical support.

2.14.2 Advances in Computer Technology and Implementation of Innovative Instructional Methods

Advances in computer technology bring new opportunities and challenges to implementation of innovative instructional methods. These methods pose the constraints of selecting appropriate media resources because as technology continues to grow, more and more learning configurations arise, each with its own set of capabilities and constraints.

2.14.3 Incompatibility and Implementation of Innovative Instructional Methods

Instructors may buy or produce instructional media in digital formats that are incompatible and inconsistent with each other. Some instructional technologies cannot be easily understood. The incompatible developments in educational technology and Public Health programme pose a challenge. Again the emergence of incompatible players (professionals and non-professionals) in the development of media resources for Public Health pose a challenge. These, normally, have widely differing interests (educational, commercial and entertainment).

2.14.4 Network and Implementation of Innovative Instructional Methods

Managing instructional media by instructors who adopt innovative methods requires an updated network system which may not be available all the time.

2.14.5 Expertise and Implementation of Innovative Instructional Methods

This refers to experts with specialized training, experience and innovative abilities to develop the instructional media for teaching and learning of Public Health. Lack of enough qualified instructional media technologists poses another challenge for developing and managing instructional media resources. The few who are available are overburdened with the demand for developing modern relevant media for innovative instructional methods.

2.14.6 Special Needs and Implementation of Innovative Instructional Methods

Developing and using instructional media resources for students with special needs is another big challenge. This calls for designers to also be conversant in special education.

2.14.7 Space and Implementation of Innovative Instructional Methods

Developing and using instructional media resources in instruction requires working space to mount, try out and store the materials. The available space may never be adequate because of the changing nature of these items.

2.14.8 Time and Implementation of Innovative Instructional Methods

Developing instructional media resources is a process that requires time. Integrating media resources into health concepts needs adequate time for planning, developing and administration. Instructional media designers may be limited in terms of time to carry out this task.

2.14.9 Complex Media Partnership and Implementation of Innovative Instructional Methods

The development and use of instructional media in teaching and learning of Public Health is a complex process. It requires expertise, management skills, related facilities (infrastructure, time and effort) and resources.

2.14.10 Dynamism and Implementation of Innovative Instructional Methods

Since Instructional media are closely associated with education which is dynamic, they are also dynamic. They change in nature to adjust to the developments both in education and society.

2.14.11 Emerging issues in Education and Society and Implementation of Innovative Instructional Methods

These are expected and unexpected developments in education and society which, in turn create the unpredictable challenges for the designers and users of Instructional media programme as observed by Kafu (2011). Among them is the present over-emphasis on research and theoretical learning that do not lend them to development and use of media resources; the failure to emphasize the teaching of logic / critical thinking as well as concept formation in modern education which require media resource use.

The development and use of instructional media involves a large number of processes and activities that must be clearly understood and appreciated (identification, selection,

development, management, policy formulation and implementation). This is the feature that makes educational media an exclusive field. The development and use of instructional media in teaching and training of health professionals is always a joint effort between the teacher and learners. This is the feature that makes media resources formidable tools in instructional process.

Emergence of a large and often contrasting huge variety of media resources for instruction in medical education. This development creates confusion in the development and of use media resources. The changing perception of education to-day where education is regarded as the end of means rather than means of the end of whatever is pursued. This approach has not considered social capital as a major component of education. The latter is heavily media-based process.

The rise of materialism / consumerism character in modern society. This development makes people to be interested in quick results/returns in whatever they are pursuing rather than being patient. This discourages the development and use of media resources which are normally painstaking process in their development, management and use.

Despite these challenges, innovative instructional methods cannot be implemented without the use of instructional media.

2.15 Summary of the Reviewed Literature

Analysis of the literature review shows that there are various innovative methods that have been used in implementation of academic programmes. The implementation has been influenced by various factors as highlighted from other studies. There are also challenges experienced in the course of implementation of innovative instructional methods.

CHAPTER THREE
RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

This chapter highlights the philosophical paradigm, research design, the study site, study population, sampling procedure, sample size, inclusion and exclusion criteria, research instruments, data collection procedures and methods of data analysis. The chapter gives the framework of how the study was conducted. The purpose of this chapter is to provide proper procedures that were followed in conducting the study.

3.2 Philosophical Paradigm for the Study

The philosophical paradigm of this study was pragmatic as espoused by Leech (2004). Pragmatism focuses on change and solving problems unlike acquiring large amounts of knowledge. Innovative instructional methods advocate for change from idealism which stresses the importance of learning ideas and concepts to pragmatism which lays emphasis on problem solving learner - centred approach.

This philosophy offers the researcher with methodological descriptions and assistance in the development of techniques that are closer to what is in research practice. It helps the researcher to bring together the insights provided by positivists and constructivists research into a workable solution (Leech, 2004). Because of its ability to offer logical and practical alternatives as well as its attempt to legitimize the use of multiple approaches in answering research questions, the researcher found it suitable for the research being undertaken. Similarly, pragmatism, being a liberal system of philosophy and reality is an added advantage to the mixed method research which freely utilizes both quantitative and qualitative approaches.

This study adopted a mixed method approach. In essence, pragmatism opens the door for a mixed method researcher to access multiple methods, different world views and different assumptions as well as different forms of data collection and analysis (Cresswell, 2011).

3.3 Research Design

A Research design is a plan and procedure for conducting research that spans the decisions from broad assumptions to detailed methods of data collection and analysis (Cresswell, 2011). From the definition above, the literature gathered and the chosen philosophical paradigm, the most suitable research design of this study was the mixed

methods approach. The mixed methods approach is a class of research where the researcher mixes or combines quantitative (positivists) and qualitative (constructivists) research techniques, methods, approaches, concepts or language into a single study (Onwuegbuzie, 2004). This design involved collecting both quantitative and qualitative data at the same time, then merging it in order to provide a comprehensive analysis of the determinants of implementation of innovative instructional methods in Public Health Programme.

The quantitative strategy (cross–sectional survey research) was used to gather numeric descriptions of level of knowledge of innovative instructional methods among a sample of students and lecturers. The qualitative strategy (phenomenological research) was used to identify students and lecturers experiences about determinants of use of innovative instructional methods. The qualitative strategy complemented the quantitative strategy. The triangulation of all data, both qualitative and quantitative led to a credible understanding of the study. This design was chosen as its overall strength is greater than either qualitative or quantitative research (Cresswell *et al*., 2007).

3.4 Location of the Study

The study site was School of Public Health, College of Health Sciences Moi University. The College of Health Sciences, Moi University, is situated in Eldoret town, Uasin Gishu County, Kenya. Uasin Gishu County has three districts, namely; Uasin Gishu West, Wareng and Eldoret East. Uasin Gishu County has a cold climate and has varied physical features among them river Sossian, Turbo Hills, Ziwa Plain, Moiben river Valley and Kesses Swamp. There are different types of Vegetation in Uasin Gishu County like Kaptagat forest, Soy Grassland and Kesses swamp among others.

3.5 Target Population

The target population was undergraduate Public Health students, the lecturers, Heads of Departments and the Dean School of Public Health in College of Health Sciences of Moi University. A total of one hundred and twenty (120) students comprising forty one (41) fourth year students, thirty nine (39) third year students, forty (40) second year students and thirty (30) lecturers and six (6) members of the management team were included in the study. All these formed a total target population of one hundred and fifty six (156). The full time lecturer population and undergraduate students formed the target population since the total population was small.

3.6 Key Informants

The key informants were the Dean School of Public Health, Heads of various departments and the administrator of the school. These respondents are key informants because they are decision makers of the school and therefore have the required information for the study.

3.7 Inclusion Criteria

The Inclusion criteria were all full time lecturers who facilitate Public Health Programme, second, third and fourth year students of Public Health and the management team of the school of Public Health willing to participate in the study.

3.8 Exclusion Criteria

This included those who were eligible for the study, that's Lecturers and students who did not consent based on their own reasons. Non - academic staff in the department of Public Health and first year undergraduate students were also excluded. Non – academic staff were excluded as they are not directly involved in the teaching of students as the lecturers. They did not meet the inclusion criteria of being full time lecturers. First year undergraduate students were also excluded since at the time of data collection, they had just joined University and therefore were not yet exposed to innovative instructional methods. They could therefore not understand the concept of innovative instructional methods to give informed responses.

3.9 Sampling Method

The method used was purposive sampling. This involves selecting a specific group that has particular characteristics suitable for the study. Purposive Sampling was used to enable the researcher get the required representation where the Public Health Programme is implemented. Census method was used where the total enumeration of the study population was included.

3.10 Sampling Procedure

This refers to the steps followed in using the sampling method. Public Health Students, their lectures and management team of the School of Public Health were specifically selected. Stratified sampling was then done. This sampling involves putting the population in different strata based on some common characteristics. The common characteristics in this case were the year and department of study. The student population was first stratified per department then stratified per year of study. Census

(total enumeration) which included all the second, third and fourth year students together with all the lecturers was then employed. Total enumeration was done in order to increase level of accuracy for generalization since the target population was small.

3.11 Sample Size

The sample size is defined as a portion of the target population that is selected for the study. Normally it should be representative of the target population. This was a total of one hundred and three (103) students comprising of thirty three (33) fourth year students, thirty eight (38) third year students and thirty two (32) second year students, a total of twenty six (26) lecturers and six (6) members of management team. This gave a sample size of one hundred and thirty five (135).

3.12 Data Collection Methods

The research instruments that were used included; questionnaire, interview and observation checklist.

3.12.1 Questionnaire

A questionnaire is an investigation tool that consists of inquiries designed in line with the study objectives to help the researcher collect data for analysis and thereafter guide in writing of the findings. Two questionnaires were formulated by the researcher for use by the respondents. The questionnaire for lecturers consisted of six sections; Part1, 2, 3, 4, 5 and 6 (Appendix 2). Part 1 consisted of the background of the respondent's gender, age, school, department of affiliation, position in the department, and level of qualification and teaching experience of the lecturer. Part 2,3,4,5 and 6 had both close-ended and open –ended questions for use in collecting information from the lecturers on the study being undertaken.

The items on the questionnaires were derived from the reviewed literature. In some of the items in part 3 for the Lecturer respondent, was required to rate each item using the likert four point scale on the degree of extent of use of media and of the methods in teaching and evaluation of the Public Health Programme. The questionnaire for students comprised of five sections; Part1, 2, 3, 4 and 5. Part 1 consisted of the background of the respondent's gender, age, school, department of affiliation and year of study. Part 2, 3, 4 and 5 consisted of both close-ended and open ended questions for students' respondents (Appendix 3). In some of the items in part 2 and part 3 of the student questionnaire , the respondent was required to rate each item using the likert

four point scale on how often the innovative methods were used in teaching of Public Health Programme. Under part 3, the likert scale was used to indicate the availability and the adequacy of instructional materials used in teaching and learning of Public Health Programme.

3.12.2 Interview

The interview schedule for Heads of Departments and the Dean only consisted of two segments. Part one consisted of general information on designation of the respondent and the number of years served in that position. The subsequent section had a likert scale, close- ended and open- ended questions for use in collecting information from the interviewees on the study being undertaken. The Heads of Departments and the Dean were interviewed on one on one basis to obtain more information that helped the researcher to understand the concept of implementation of innovative instructional methods in Public Health Programme.

3.12.3 Observation Checklist

This had only one section with five items to collect information on type of physical facilities, location of facilities, adequacy of facilities, condition of facilities and appropriateness of the facilities.

3.13 Validity and Reliability of the Research Instruments

3.13.1 Validity of the Research Instruments

Validity is defined by Mayor (2006), as the general and reasonable level of accepting the instrument to perform a task. Two approaches of content Validity and Face Validity were used. Content validity refers to how accurately a measuring tool captures the various aspects of the concerned study while Face Validity refers to the extent to which a test is subjectively viewed as covering the concept it is to measure. The questionnaire designed to collect information on implementation of innovative instructional methods in Public Health Programme was content and face validated by the supervisors mentioned in this study through estimation of content and face validity. Thereafter, modification and necessary adjustment was done to the questionnaire in order to suit the content validity. The suitability of the items ad appropriateness of the language was determined by the supervisors' advice and input. To provide means of validation during the work of data collection and analysis, triangulation was employed (multiple sources of data, different data collection methods, and multiple methods of analysis).

3.13.2 Reliability of the Research Instruments

According to Role (2007), reliability is the degree to which an instrument is dependable. To test for the reliability of the research questionnaire that was used in the study on implementation of innovative instructional methods in Public Health Programme, the questionnaire was administered to some lecturers and some students in the school of Hospitality and Tourism of University of Eldoret for Pilot Study. This school in University of Eldoret was selected as the school adopts the Problem –based teaching / learning approach. PBL is one of the innovative methods. The necessary adjustments were made on the questionnaire following the responses collected to ensure reliability of the research tool.

3.14 Data Collection Procedure

Pre-tested structured and unstructured questionnaire were administered to the lecturers and the students by the researcher to gather quantitative data. A survey questionnaire was used to inquire about the level of knowledge of innovative instructional methods and determinants of implementation. Survey is a measurement tool widely used in education (Chen *et. al.*, 2003). Structured interviews were conducted among the Heads of Departments and the Dean, School of Public Health to gather qualitative data. A structured observational check list was used to assess the adequacy of facilities and resources for use in innovative instructional methods. Consensus among other authors of implementation exists that observational data represent the most reliable method for assessing implementation (Durlak, 1998; Dusenbury, Brannigan, Hansen, Walsh, *et al.*, Falco, 2005; Moncher *et al*., 1991).

3.15 Data Analysis

Since the research design of this study was mixed methods type, the data collected from the research was analyzed using both quantitative and qualitative techniques. Data was recorded using Microsoft Excel software package. The data collected was then coded accordingly in order to facilitate analysis. Quantitative data was summarized using frequency counts and tables then analysed using linear regression statistical method. Qualitative data was grouped into broader categories, content coded for open - ended questions and analysed using descriptive statistics. Interview was summarized using summary form and described to give meaning. Data from observation checklist was summarized for easy understanding.

3.16 Localization of the Research

The study was conducted in Moi University, a Kenyan Univesity. English language was the medium of communication. This study adhered to Moi University, College of Health Sciences research guidelines.

3.17 Ethical Considerations

This refers to precautions taken to ensure anonymity of the respondents and confidentiality of the research. Participants' written informed consent was sought. Participants were not required to disclose their personal identity. Participation was voluntary. All the obtained information was handled confidentially. Approval to conduct the research was secured through Institutional Research and Ethics Committee (IREC), college of Health Sciences, Moi University. The study was started only after approval by IREC. Permission to collect data was sought and granted from the School of Public Health, Moi University. Study findings will be disseminated to participants and interested parties through academic forums like conferences and workshops. A written bound thesis will be availed in Moi University Library.

3.18 Chapter Summary

This chapter explained the frame - work of the study by discussing the philosophical paradigm, research design, the study site, study population, sampling procedure, sample size, inclusion and exclusion criteria, research instruments, data collection procedures and methods of data analysis.

CHAPTER FOUR
DATA ANALYSIS, PRESENTATION AND INTERPRETATION

4.1 Introduction

This chapter presents the results of data analysis, presentation and interpretation. The chapter first presents the research results on the demographic characteristics of the respondents. This is then followed by the presentation of the data analysis according to the objectives of the study. The findings are discussed under the following titles: Level of knowledge of Innovative Instructional Methods; Application of Innovative Instructional Methods in Implementation of Public Health Programme; Factors that influence the use of Innovative Instructional Methods in the Public Health Programme; Challenges faced in the use of Innovative Instructional Methods in the Implementation of the Public Health Programme, and the Interventions in the use of Innovative Instructional Methods in the Implementation of the Public Health Programme.

4.2 Results of Demographic Characteristics

4.2.1 Demographic Characteristics of Lecturers

The study included thirty (30) lecturers to take part in the study. However, only twenty six (26), participated by filling the questionnaire. Four (4) respondents did not avail the questionnaires back. This gave a response rate of 86.6% among the lecturers. To begin with, the study sought to establish the demographic characteristics of lecturers. The characteristics sought were details like sex, age, Department in which they taught the level of educational qualifications and their teaching experience in years. The findings of the study as regards sex of the respondents were as shown in Table 4.1 below.

Table 4.1: Sex Distribution of Lecturers

Gender	Frequency	Percentage
Male	14	52.8
Female	12	47.2
Total	**26**	**100**

As indicated in Table 4.1, 14(52.8%) of the lecturers were male while 12(47.2%) were female. As such there were more male than female lecturers in the School of Public Health at the time of the study. This could be attributed to applicants who apply for vacant teaching positions when advertised in the school of Public Health. Possibly more men apply and therefore more are hired than the female. Female candidates should be encouraged to apply for gender balance among the staff within the school.

The study also sought to establish the age distribution among lecturer – respondents. Their responses were as indicated in Table 4.2 below.

Table 4.2: Age Distribution of Lecturers

Age	Frequency	Percentage
25-31	1	3.8
32-38	4	15.4
39-43	7	26.9
46-52	5	19.2
53-59	4	15.4
60-66	4	15.4
67-73	1	3.8
Above 73	0	0.0
Total	**26**	**100.0**

As indicated by Table 4.2, of all the lecturers, majority, 7(26.9%), were aged 39-43 years. This was followed by 46- 52 (19.2%) age bracket. Three groups aged 32-38 years, 53-59 years and 60-66 years had four members each (15.4%). The rest of the lecturers, 1(3.8%) in each group, were aged 25-31 years and 67-73 years. The ages are well spread from 25-31 to 67-73. Majority 26.9% are at the prime working age (39-43) who could contribute immensely to the growth of the school. However, only 1% represents 67-73 of whom vast academic experience to share with the other staff. This small percentage could disadvantage the school as they may not be able to share their vast experience with all members of the academic staff. None of the full – time lecturers was above 70 years of age. This is in line with the University policy on retirement at 70 years.

All the lecturer respondents worked in the School of Public Health, but in different Departments. The research sought to establish the distribution of lecturer respondents according to their respective departments. The findings were as indicated in Table 4.3 below.

Table 4.3: Distribution of Lecturers across Departments

Department	Frequency	Percentage

Nutrition	6	23.1
Epidemiology and Biostatistics	5	19.2
Environmental health	9	34.6
Health policy	6	23.1
Total	**26**	**100.0**

The results in Table 4.3 indicate that majority, 9(34.6%), of the lecturers who took part in this study came from the Department of Environmental Health. A good number of them worked in the Departments of Nutrition, 6(23.1%) and Health Policy, 6(23.1%). The remaining 5(19.2%) lecturers worked in the Department of Epidemiology and Biostatics. This could be a reflection of the courses offered in the school of Public Health and hence the number of lecturers per department. More courses and therefore more students are in the department of Environmental Health. This is explained by the fact that the school of Public Health at its establishment in 1998 focussed on offering a four year university degree programme leading to the award of Bachelor of Science in Environmental Health. The small percentage 19.2% of lecturers in the department of Epidemiology and Biostatistics indicates fewer students take courses in that department. The other three departments (Nutrition, Health Policy, Epidemiology and Biostatistics were introduced later hence the few numbers.

The study further sought to determine the academic qualifications of the individual lecturers who took part in the study. Their responses to this issue were as shown in the Table 4.4 below.

Table 4.4: Level of Academic Qualification

Level of qualification	Frequency	Percentage
Bachelors	1	3.8
Masters	11	42.3
PhD	14	53.8
Total	**26**	**100.0**

As the findings in Table 4.4 reveal, over half, 14(53.8%), of the lecturers were Ph.D. holders. A good number, 11(42.3%), of them held master's degrees and only 1(3.8%) was a Bachelor's Degree holder. More than half (53%) of academic staff being Ph.D. holders is in line with the policy of higher education on academic staff which puts

emphasis on Ph.D. The 1% Bachelors could be a research assistant in the school since most courses in the School of Public Health involve research.

Having established their academic qualification, the study sought to identify the teaching experience in years of the lecturers. Their responses to this item were as indicated in Table 4.5.

Table 4.5: Teaching Experience of Lecturers in Years

Teaching experience	Frequency	Percentage
3 years	2	7.7
4 years	2	7.7
6 years	2	7.7
9 years	3	11.5
10 years	3	11.5
13 years	3	11.5
14 years	2	7.7
18 years	2	7.7
19 years	1	3.8
20 years	1	3.8
21 years	1	3.8
23 years	2	7.7
26 years	1	3.8
40 years	1	3.8
Total	**26**	**100.0**

From the results presented in the Table 4.5, the majority, 3(11.5%), of the lecturers had served in their present positions for 9 years, 10 years and 13 years. In addition, at least 2(7.7%) of the lecturers in each case indicated that they had served for 3 years, 4 years, 6 years, 14 years, 18 years and 23 years. Lastly 1(3.8%) lecturer each indicated that they had served for 19 years, 20 years, 21 years, 26 years and 40 years. All the lecturers have a teaching experience of above 3 years, therefore the school of public health has an experienced academic staff who are in a better position to implement innovative instructional methods, save for their willingness to embrace the methods. With nine (9) out of the twenty six (26) lecturers having served for between 9 and 13 years, is a good indicator of the school of Public Health having experienced staff members.

4.2.2 Demographic Characteristics of Students

The respondents were one hundred and three students. All the students were from the School of Public Health.

4.2.2.1 Sex of the Respondents

The study sought to establish the distribution of students according to their sex. When the relevant questionnaire item was analyzed the results presented in Table 4.6 were established.

Table 4.6: Sex Distribution of Students (N = 103)

Gender	2nd Yr	3rd Yr	4th Yr	Total	Percentage
Male	15	15	14	**44**	42.7
Female	17	23	19	**59**	57.3
Total	**32**	**38**	**33**	**103**	**100.0**

The findings in Table 4.6 show that most 59 (57.3%) of the student - respondents were female while the rest 44 (42.7%) were male. Further, this implied that there were more female than male respondents in the study. These numbers reflect a gender shift in enrolment from more male in the past to more female currently. Further to this, public health as one of the fields of study in health, attracts more female students than the male. This trend should however not be encouraged as it may lead to gender imbalance in Public Health profession in the future. There is need for numbers to reflect a balanced distribution.

4.2.2.2 Age Bracket

The students were asked to indicate their ages based on the age ranges provided. This was aimed at establishing whether all the students were within age bracket of completing high school or others were adult learners. Their responses were as summarized in Table 4.7.

Table 4.7: Age Distribution of Student – Respondents

Age	2nd Yr	3rd Yr	4th Yr	Total	Percentage
18-24	29	31	20	**80**	**77.67**
25-31	3	7	13	**23**	**22.33**

Table 4.36 shows that the majority 80 (77.67%) of the student respondents were age group range 18-24 years, 23 (22.33%) were aged between 25 and 31 years. None of the

students were aged between 32- 38 years and 39-45 years. These findings show that most of the students were in the age range of 18-24 years. This group falls within the stipulated age bracket of undergraduate students within the Kenyan Education system. The 22.33 % of age bracket 25-31 represents the mature entry students, which is allowed in higher institutions of learning in Kenya. This age bracket of students could have gone back to advance their studies from diploma to degree.

4.2.2.3 Students' Year of Study

The study sought to establish the distribution of the student - respondents based on their years of study and when data collected on the relevant item was analysed, the results are presented in Table 4.8.

Table 4.8: Year of Study of Student Respondents

Year of Study	Frequency	Percentage
Second	32	31.1
Third	38	36.9
Fourth	33	32.0
Total	**103**	**100.0**

The findings show that, of the student - respondents, 31.1% were second-years, 36.9% were third-years and 32.0% were fourth-years. This shows generally there was a higher response rate among the third year group of students than in the other two classes. The distribution of students among the classes does not reflect a steady upward trend. The decline could reflect shift in preference of course or limited admission due to the school policy. The school could look into the possible cause of the decline in number of students from thirty eight (38) to thirty three (33) to ensure student enrollment increases yearly. Public Health is an important field of study that promotes the health of populations; therefore more students should be encouraged to study this course.

4.3: Level of Knowledge in Innovative Instructional Methods

The first objective of the study was to assess the level of knowledge in innovative instructional methods among the respondents. To achieve this objective, the lecturer - respondents were first asked to indicate the types of innovative instructional methods that they were aware of from among a list provided. The scores from their responses were as indicated in Table 4.9.

Table 4.9: Lecturers' level of knowledge in Innovative Instructional Methods

Innovative Instructional Method	Frequency	Percentage
Small Group Tutorial (SGT)	26	100.0
Small Group Discussions (SGDs)	26	100.0
Problem-Based Learning (PBL)	26	100.0
Community-Based Education and Service (COBES)	26	100.0
Computer-Assisted Instruction (CAI)	16	61.5
Computer-Assisted Assessment (CAA)	14	53.8
E-Learning	23	88.5
Self-Directed Learning (SDL)	22	84.6
Independent Study (IS)	19	73.1
Electives	26	100.0

Based on the results presented in Table 4.9, all the 26(100.0%) of the lecturers indicated that they were aware of the following innovative instructional methods: Small Group Tutorial (SGT), Small Group Discussions (SGDs), Problem-Based Learning (PBL), Community-Based Education and Service (COBES) and Electives. Majority was aware of: E-Learning, 23(88.5%); Self-Directed Learning (SDL), 22(84.6%) and Independent Study (IS), 19(73.1%). A good number, 16(61.5%), of the lecturers were aware of Computer-Assisted Instruction (CAI) and slightly more than half, 14(53.8%), of the lecturers were aware of Computer-Assisted Assessment (CAA).

Innovative instructional methods are therefore, not new to the lecturers as all of them were aware of them. Innovative Instructional Methods have been in use even in other academic programmes. The lecturers may have come across some of the methods like Small Group Tutorials (SGTs) and Small Group Discussions (SGDs) during their study years. Furthermore, those who may have not come across them would have been inducted in the methods upon joining the college of Health Sciences, School of Public Health of Moi University. From the background information, SPICES model and COBES programme have been mandatory approaches of teaching at the School of Public Health, Moi University.

Table 4.10: Statistical Analysis to determine the level of knowledge of Innovative instructional methods among lecturers

Variable	p-Value

Computer Assisted Instruction	.001
Computer Assisted Assessment	.030
E-Learning	.276
Self-Directed Learning	.000
Independent Study	.733

Multivariate analysis was performed to assess the relationship between years of experience and level of knowledge of innovative instructional methods. Statistical significance was found in Computer Assisted Instruction, Computer Assisted Assessment and Self-Directed Learning at p-value of 0.001, 0.030 and 0.000 respectively at p of 0.05. There was no statistical significance between E-learning and Independent study p-value of 0.276 and 0.733. Other variables like Small Group Tutorial, Small Group Discussion, Problem Based Learning, COBES and Electives could not be computed because the variables were constants.

Further analysis was done to assess the relationship between lecturer's age and their level of knowledge of innovative instructional methods. There was statistical significance between Computer Assisted Instruction and Self Directed Learning with a p-value of 0.048 and 0.009 respectively at p of ≤ 0.05.

As a follow-up question, the lecturer respondents were asked to indicate other instructional methods that they knew about. Their responses to this item were as summarized in Table 411.

Table 4.11: Other Instructional Methods Lecturers were aware of

Other methods	**Frequency**	**Percentage**
Demonstrations	14	53.8
Lectures	18	69.2
Experiments / practical sessions	12	46.2
Skits / drama	11	42.3
Field Study	16	61.5
Self-appraisal	11	42.3
Project report writing	12	46.2

Simulation	11	42.3
Research	11	42.3
Interactive sessions	11	42.3
Question and answer method	13	50.0

As indicated in the research findings in the Table 4.11, majority, 18(69.2%), of the respondents were also aware of lectures as another method of instruction. Many, 16(61.5%), of them indicated field study. A good number, 14(53.8%), of the lecturers indicated demonstrations and half, 13(50.0), indicated question-and-answer as other methods they were aware of. Some, 12(46.2%), of the lecturers in each case indicated that they were aware of: practical sessions and project report writing. Similarly, a significant number of lecturers, namely 11(42.3%) in each case, said they knew about the following methods: skits or drama, self-appraisal, simulation, research and interactive sessions. These are all other methods known to the lecturers. Apart from innovative methods, lecturers could be using some of these methods in instruction especially the ones they are most familiar with.

Therefore, Innovative Instructional Methods are not the only methods used in implementation of Public Health Programme. Whether it is a school policy to use these methods, the lecturers do not restrict themselves to these methods. Hence, an intergrated strategy of both innovative and other methods is more practical.

To further probe their understanding of the nature of innovative instructional methods, the lecturers were asked to indicate their responses based on the variables provided, that is, whether Innovative Instructional Methods were: traditional or modern, learner - centred or facilitator - centred. The results were as presented in Tables 4.12, 4.13, 4.14 and 4.15.

Table 4.12: Traditional vs. Modern

Response	**Frequency**	**Percentage**
Traditional methods	0	0.0
Modern methods	26	100.0
Total	**26**	**100.0**

As shown in Table 4.12, all the twenty six (100.0%), of the lecturers described innovative instructional methods a**s** being modern. None of them said the methods were

traditional by nature**.** Therefore innovative methods are modern instructional methods as being opposed to traditional, Being modern then calls for use of modern strategies in their implementation.

Table 4.13: Learner - centered vs. Facilitator – Centered

Response	Frequency	Percentage
Learner-centered	26	100.0
Facilitator-centered	0	0.0
Total	**26**	**100.0**

Table 4.13 shows that, according to the entire twenty six (26) lecturers - respondents, (100.0%), innovative instructional methods are learner - centred as opposed to being facilitator - centred. This agrees with the findings by Chen (2002) who says that these are methods which are becoming increasingly popular in instruction and their main characteristic is the transfer of responsibility of learning from the teacher to the learner (student-centred). This learner - centred approach of learning that is emphasized by innovative instructional methods allow the students to discover ideas on their own and add to the knowledge they possess as they actively learn. These same sentiments are echoed by Zhu, (2010) who pointed out the role of the instructor to be a facilitator. Learner - centred approach is relevant to the teaching and training of Public Health as Public Health Practitioners are required to be innovative in way of identifying a public health concern and being innovative enough in coming up with an applicable solution.

Table 4.14: Applicability of Innovative Instructional Methods

Response	Frequency	Percentage
Large student population	8	30.8
Small student population	18	69.2
Total	**26**	**100.0**

The study found that majority, 18(69.2%), of the lecturers believed that innovative instructional methods were most applicable with small student populations. This

finding as shown in table 4.14 agrees with those established by Mutema *et al*. (1992) who noted that one characteristic of innovative instructional methods is that they favor the teaching of students in small groups and in tutorial rooms as opposed to many students in lecture halls. The best teacher to student ratio is 1:1 for tutorial and 5-10 students for discussion group (Ngatia *et al*., 2009). However, 8(30.8%) of the lecturers believed that the methods were most applicable with large student populations. This could be one of the factors that determine use of innovative instructional methods. A large student population cannot actually allow for use of Innovative Instructional Methods which mostly call for close student attention. Therefore, large student population poses a challenge to implementation of Innovative Instructional Methods.

Analysis of applicability of innovative instruction methods was done and results are presented in the table below. The results were significant at p value of 0.005 at $p \leq 0.05$.

Table 4.15: Statistical Analysis of Applicability of Innovative Instructional Methods to a given Student Population

	Yes	**No**	**Marginal Row Totals**
Large student population	8 (13) [1.92]	18 (13) [1.92]	26
Small student population	18 (13) [1.92]	8 (13) [1.92]	26
Marginal Column Totals	26	26	52

The chi-square statistic is 7.6923. The *p*-value is .005546. This result is significant at $p < 0$ .05.

Table 4.16: Students Allowed Learning on their own

Response	**Frequency**	**Percentage**
Yes	16	61.5
No	10	38.5
Total	**26**	**100.0**

As shown in table 4.16, the majority, 16(61.5%), of the lecturers affirmed that innovative instructional methods require the facilitator to withdraw at some point during the learning process to allow students to learn independently on their own. This is in line with Constructivism learning theory which this study was anchored on.

Constructivism promotes a student's free exploration within a given framework or structure (Lombardi, 2011).The teacher acts as a facilitator who encourages students to discover principles for themselves and to construct knowledge by working answering open – ended questions and solving real-world problems. To do this, a teacher encourages curiosity and discussion among the students as well as promotes their autonomy. On the other hand, a sizeable number, 10(38.5%), of the lecturers disagreed with this view. The thirty eight point five percent (38.5%) who think students should be not be left on their own at some point to learn may not be aware of the aspects of innovative instructional methods. The 61.5 % who believe students could be left on their own at some point to learn advocate for innovative instructional methods. Hence they could be using innovative instructional methods in implementation of the public health programme.

Lastly, under the first objective, the lecturers were asked to indicate which among the listed innovative instructional methods allowed students to identify areas of learning which were of interest to the students. The lecturers' responses to this item were as summarized in Table 4.17.

Table 4.17: Innovative Instructional Method that allows Students to identify areas of learning which are of interest to them

Response	Frequency	Percentage
Electives	17	65.4
Problem - Based Learning	14	53.8
Self-discovery	12	46.2
Self-directed learning	12	46.2
Practical sessions	11	42.3
Demonstrations	11	42.3

Research - based assignments	11	42.3
Tutorial assignments	11	42.3

As shown by the findings presented in Table 4.17, according to the lecturers, electives mostly, 17(65.4%), allowed students to identify areas of learning which were of interest to them. Most, 14(53.8%), of the lecturers said Problem-Based Learning (PBL) allowed students to identify areas of learning which were of interest to them. A similar number, 12(46.2%), of lecturers said this effect was achieved through self-discovery and self-directed learning methods. Other lecturers, 11(42.3%) in each case, identified the following innovative instructional methods: practical sessions, demonstrations, research-based assignments and tutorial assignments.

Electives was identified by a high percentage of lecturers as the method most preffered in allowing students identify areas of interest to them. This is because practically, the school policy gives the students a chance to choose a unit of study during their last academic year. The unit chosen is per the students' preference. This preference goes hand in hand with Ballimore, (1998) view that it is no longer possible for students to study in depth all topics in the curriculum. This in an enrichment option in learning as according to Harden *et al.* (1984), the most important outcome of an elective is often the change of the student's attitudes towards their studies and professional practice. It is actually the elective method that can allow students to identify the area of learning that is of interest to them. In this case, students choose a particular unit that they can focus on and this allows for specialization.

The other methods that had 42.3 % responses are general, being applied by all students across all units of study and therefore do not call for selection.

The Dean and Heads of Departments were interviewed to assess their level of knowledge on innovative instructional methods. To achieve this objective, the respondents were asked to indicate the extent to which themselves, lecturers and the students knew about innovative instructional methods. From the interview, four (4) out of the six (6) interviewees knew about innovative instructional methods to some extent, while two (2) knew about the methods to a great extent. Two (2) interviewees indicated the students knew about innovative instructional methods to some extent while four (4) thought the students knew about these methods to a great extent. Three (3) of the

respondents in each case indicated that the academic staff knew about innovative instructional methods. None of the interviewees did not know about existence of innovative instructional methods amongst themselves, the students and academic staff. These findings indicate a high level of knowledge of innovative instructional methods among the Heads of the various Departments and the Dean school of Public Health. Therefore innovative instructional methods are not a new phenomenon in the school of Public Health.

To further probe the use of innovative instructional methods in various Departments and in the school of Public Health, the respondents were asked to indicate their responses based on the variables provided. The results of the analyses are presented in Tables 4.18, 419.

Table 4.18: Shift from Traditional Methods to Innovative Methods

Response	Frequency	Percentage
Yes	6	100
No	0	0
Total	**6**	**100.0**

As shown in Table 4.18, all, 6(100.0%) members of the management team agreed there had been a shift from traditional methods of teaching to modern innovative instructional methods in Public Health Programme. None of them said there was no shift from traditional methods of teaching to modern innovative methods of teaching. Therefore there has been a shift from traditional teaching methods to innovative teaching methods in the school of Public Health.

Table 4.19: Flexibility and Adaptability of Innovative Instructional Methods in teaching Public Health Programme

Response	Frequency	Percentage
Yes	4	66.0
No	2	34.0
Total	**6**	**100.0**

Table 4.19 shows that 4, (66.0%) members of the management team respondents, indicated that innovative instructional methods were flexible and adaptable as opposed

to 2 (34%) who said they were not adaptable and flexible. This indicates that innovative instructional methods are flexible enough and hence can be adopted even in the teaching of Public Health Programme. Most of the innovative instructional methods for example independent study and e-learning allow students to study at the time and place of their choice thus being quite flexible and adaptable.

4.4 Application of Innovative Instructional Methods in Implementation of Public Health Programme

The second objective of the study was designed to assess the application of innovative instructional methods in the implementation of Public Health Programme in the School of Public Health. To achieve this objective, a number of variables were explored in the study. The first item in the questionnaire under this objective sought the lecturers' views on whether or not innovative instructional methods were used in implementation of Public Health Programme. The responses to this item were as summarized in Table 4.20 below.

Table 4.20: Innovative instructional methods as used in implementation of Public Health Programme

Response	Frequency	Percentage
Yes	26	100.0
No	0	0.0
Total	26	100.0

As indicated in Table 4.20, all the lecturers, 26(100.0%), affirmed that innovative instructional methods were used in implementation of Public Health Programme. Hence, Innovative Instructional Methods are not a new idea in the School of Public Health. This, therefore, leads to the question of what determines the use of innovative instructional methods in implementation of Public Health Programme that this study sought to address.

The second item under the same objective asked the lecturers to list some of the innovative instructional methods used in teaching of Public Health Programme. The methods they listed were as summarized in Table 4.21.

Table 4.21: The Innovative Instructional Methods used in Teaching of Public Health Programme

Response	Frequency	Percentage
PBL	21	80.8
COBES	20	76.9
SGTs	14	53.8
SDL	13	50.0
SGDs	19	73.1
Tutorials	12	46.2
Electives	14	53.8
E-learning	13	50.0
Project writing	11	42.3
Students' presentations	11	42.3
Overviews	11	42.3
Field study	12	46.2
Video Link	11	42.3
Independent study	11	42.3
Visual aids	11	42.3
Internet search	13	50.0

From the results in the Table 4.21, majority, 21(80.8%), of the lecturers indicated that Problem - Based Learning (PBL) were the most frequently used methods in teaching of public health programme. This was followed by Community - Based Education and Service (COBES) at 20(76.9%) and then Small Group Discussion (SGDs) at 19(73.1%). These results show that the three methods of PBL, COBES and SGDs were the most popularly used according to the lecturer respondents. Savin *et al*. (2004) observe that Problem Based Learning (PBL), may be implemented in a variety of ways and it is now extensively practiced in medical education and other health-related disciplines including veterinary medicine and nursing. Problem-Based Learning is not totally a new method of teaching. Public Health, being a health related discipline, adopts this approach that allows a student to take a community health problem as stimulus for learning. This is in line with Edward *et. al.* (2001) who had a view of students seeking solutions to real life problems and, thereby, deriving understanding of underlying principles and concepts.

In addition, many of the lecturers said Small Group Tutorial (SGTs) and electives were used, with each of these methods being indicated by 14 (53.8%) of the lecturers. At least half, 13(50.0%), of the lecturers, in each case, reported that Self - Directed Learning (SDL), e-learning and internet search were commonly used innovative methods. A significant proportion of the lecturers, 12(46.2%) in each category, said tutorials and field study were used. Lastly, 11(42.3%) lecturers in each case indicated the following methods as most commonly used in teaching of public health programme: project writing, students' presentations, overviews, video links, independent study and visual aids. These methods are popular as both the lecturers and students are familiar with them. The methods that fall under the 11(40.3%) category, that is Project writing, Students presentations, Video link, Independent Study and Visual Aids methods are not used a lot, could be due to large student population. These methods are most practical with small student population. Another reason would be limited availability of the needed modern ICT equipment and there being not applicable to all courses. Project writing is mostly used as an instructional method for some particular courses in the fourth year of study.

Following the above item, the lecturers were asked to indicate which among the innovative instructional methods were most used in teaching of Public health programmes. Their responses were as presented in Table 4.22.

Table 4.22: Most Used Innovative Instructional methods in Public Health Programme

Response	Frequency	Percentage
PBL	17	65.4
COBES	15	57.7
SDLs	12	46.2

SGTs	12	46.2
SGDs	13	50.0
Tutorials	11	42.3
Electives	11	42.3

The research findings in Table 4.22 show that most, 17(65.4%), of the lecturers indicated that problem-based learning was most used in teaching of public health programmes. The views of this finding is in agreement with the views of Lambert *et al.* (2004) and Schmidt (1993), who observe that Problem Based Learning (PBL) is the most famous implementation of constructivists' theory. Given the constructivist nature of the Problem Based Approach (PBL) approach, there is a larger retention of knowledge and students enjoy their learning experience far more than in traditional approaches-course content is understood more thoroughly. Bauer *et al.* (2008) found that students enjoyed the real world of work issues and teamwork aspect of Problem Based Learning (PBL).

A good number of the lecturers, 15(57.7%), also said COBES was the most used method. Half of the lecturers 13(50.0%) indicated use of SDGs. Based on these results, it is clear that PBL, COBES and SDGs were the most used methods. The rest of the innovative instructional methods were scored as follows: SDLs, 12(46.2%); SGTs, 12(46.2%); tutorials, 11(42.3%) and electives, 11(42.3%).

Similarly, Lambert *et al.* (2004) observes that PBL 'is the most famous implementation of constructivists' theory'. This is so because PBL emphasizes on identifying a study problem and addressing it. This is in line with constructivist theory that focuses on student discovery of knowledge for them.

Table 4.23: Statistical analysis of most used Innovative Instructional Methods

Model	**Coefficients**				
	Unstandardized Coefficients		**Standardized Coefficients**	**T**	**Sig.**
	Beta	**Std. Error**	**Beta**		
(Constant)	.944	.573		1.649	.119

PBL	1.278	.537	.563	2.379	0.030
COBES	-015	.842	.000	.000	1.000
SGT	1.000	.842	.390	1.188	.252
SDL	.500	.687	.220	.728	.477
SGD	.500	.842	.205	.594	.561
Tutorials	-016	.842	.000	.000	1.000
Electives	-3.000	.842	-1.384	-3.565	.003
Independent Study	.500	.842	.229	.594	.561

There was a statistical significance between use of electives and PBL at the different departments of p value of 0.003 and 0.030 respectively. According to the beta coefficients, use of PBL was the strongest independent variable followed by small group tutorial as the most used innovative instruction method.

The lecturers were also asked to indicate other methods that they had used or witnessed being used in the implementation of the Public Health Programmes. Their responses were as presented in Table 4.24.

Table 4.24: Other Methods used in Teaching of Public Health Programme

Response	Frequency	Percentage
Field study	13	50.0
Lecture method	17	65.4
Question-Answer method	16	61.5
Demonstrations	11	42.3
Seminars	11	42.3
Workshops	11	42.3
Research based	11	42.3
Overviews	12	46.2

The presentations in Table 4.24 show that according to the lecturers, other methods that were most commonly used in the implementation of the Public Health Programmes were: the Lecture method, 17(65.4%); Question-and-answer method, 16(61.5%) and field study, 13(50.0%). The following methods were also mentioned: Overviews was indicated at 12(46.2%) and Demonstrations, Seminars, Workshops, Research based learning, each of which was indicated by 11(42.3%) lecturers. These findings imply that lecture method which is among the traditional methods of instruction is still widely used in teaching of Public Health programme though there is emphasis on innovative

instructional methods. From the literature review, the several advantages of lecture method including providing an economical way of using staff time, offering a wide field of knowledge in a short time and being an alternative method of teaching when books are in short supply contribute to its wide use. The large class sizes have led to an increased movement towards a mainly lecture methodology for teaching which has led to far less interaction between students and lecturers and learning quality is thus compromised (Kezar *et al*., 2006). This persistence of other methods is due to there being most established and widely used. There are no laid down rules prohibiting use of these methods hence no stern measures could be taken to discourage their use.

The study sought to assess among the students the application of innovative instructional methods in the implementation of Public Health Programme. In line with this, the study first sought to identify the innovative methods that have been used in the teaching and learning of Public Health Programme. The students were provided with a list of innovative instructional methods to indicate their rating on those that had been used most often. The results were as presented in Table 4.25.

Table 4.25: Innovative Methods that have been used most often in Public Health Programme

Innovative instructional method	2nd yr	3rd yr	4th yr	Total	Percentage
Small Group Discussions (SGDs)	28	36	30	**94**	91.3
Small Group Tutorial (SGT)	25	34	31	**90**	87.4
Problem-Based Learning (PBL)	26	37	33	**94**	91.3
Community-Based Education and Service (COBES)	28	27	33	**88**	85.4
Computer-Assisted Instruction (CAI)	18	18	18	**54**	52.4
Computer Assisted Assessment (CAA)	18	16	16	**50**	48.5

E-Learning	21	24	21	**66**	64.1
Self-Directed Learning (SDL)	25	34	33	**92**	89.3
Independent Study (IS)	23	27	32	**82**	79.6
Electives	21	29	30	**80**	77.7

From Table 4.25, it is clear that, according to the majority (91.3%) of the student - respondents Small Group Discussion (SGDs) and Problem-Based Learning (PBL) are the methods mostly used in instruction of Public Health Programme. Of the students, 89.3% said Self-Directed Learning (SDL) had been used, 87.4% said Small Group Tutorial (SGTs) had been used, 85.4% said Community-Based Education and Service (COBES) had been used, 79.6% said Independent Study (IS) had been used, 77.7% said Electives had been used, 64.1% said E-learning had been used, 52.4% said Computer-Assisted Instruction (CAI) had been used and 48.5% said Computer Assisted Assessment (CAA) had been used.

According to the students, Small Group Discussion and Problem Based Learning are the most used innovative methods used in the Public Health Programme. These two methods have a similar high percentage which goes in line with the argument of Edward *et. al.* (2001) who said that Problem Based Learning as a teaching Strategy involves having students work cooperatively in small groups to seek solutions to real life problems and thereby derive understanding of underlying principles and concepts and more importantly develop skills of becoming self- directed learners. Indeed it is evident that self – directed learning follows with 89.3% of the students indicating that it is used in the Public Health Programme. This approach requires learners to seek to learn on their own with the facilitators simply guiding them.

Computer Assisted Instruction and Computer Assisted Assessment have lower percentages compared to the other methods. These two require the availability of Computers in good working condition and the staff have also to be well versed with their use. Limited numbers of computers as learning resources cannot allow many facilitators to use this method in instruction. Availability of computers that are not functional, limited availability of network, all contribute to less use of CAI and CAA as methods of instruction. Inadequate knowledge on use of computer programmes designed for instruction limits their usage.

The student respondents were further asked to list other teaching and learning methods that had been used other than the listed ones in teaching and learning of the Public Health Programmes. The methods that were mentioned by the students included those indicated in Table 4.26.

Table 4.26: Students' responses on Other Methods of Teaching in Public Health Programme

	2nd yr	3rd yr	4th yr	Total	Percentage
Practical sessions	12	22	24	56	54.4
Lectures	25	23	20	68	66.1
Assignments (take-away, class assignments)	11	13	26	50	48.5
LCD – projections /Slides	13	17	19	49	47.5
Field study	17	16	17	50	48.5
Lecture overviews	16	19	21	56	54.4
Handout notes	15	22	26	63	61.1
Use of internet / emails to send notes	11	11	12	34	33.0
Library use	21	15	11	47	45.6

The findings showed that lectures were the most (66.1%) used of these other methods. This was followed by handout notes (61.1 %) and question – answer method (58.3%), lecture overviews (54.4%), practical sessions (54.4 %). Other methods included educational trips (45.6%), assignments (i.e. take-away assignments and classwork) (48.5%) and field studies (48.5%) and library use (45.6%), slides (47.5%), use of internet (33.0 %).

Lecture method has a high total percentage as it used in instruction across all the years. This method has been in use for a long time. Probably the facilitators were taught using this method and could be more comfortable using such a method that they are familiar with. Lecture method forms a basis for other methods as it is through this method that the content is explained; It can include material that is not readily available in textbooks and it can save a student's time by summarizing a field of study.

Other methods like Practical sessions and Field study then follow. Internet has less use across all the classes. This could be attributed to the cost involved in and accessibility of internet services. Internet use if well accessed could enhance adoption of innovative

instructional methods as it provides quick access to information presented in a variety of formats; pictures, videos, power point among others.

The students were asked to state the frequency of use of the other methods they had listed. The ratings were as presented in Table 4.27.

Table 4.27: Frequency of Use of Other Methods

Innovative instructional method	Not at All			Rarely			Often			Very Often		
	2nd yr	3rd yr	4th yr	2nd yr	3rd yr	4th yr	2nd yr	3rd yr	4th yr	2nd yr	3rd yr	4th yr
Practical sessions							16	22	16		16	
Lectures							19	19	18	17		17
Assignments (Take-away, class assignments)							17		16			17
PowerPoint presentations									16			16
Educational trips								18	16			17
Motivational Talks							16					
Field study							17	16	17			
Question and answer method							17	16				
Teacher-student directed learning										16		
Lecture overviews							16		18		17	18
Handout notes								16			16	
Use of internet/emails to send notes									16			
Library use											17	
Slides											16	

On the lecture method, 54.4% said that they were often used and 33.0% said they were used very often. Therefore, the lecture method was the most used of the other methods identified by the students.

Practical sessions were also used more often. Of the students, 36.9 said practical sessions were often used, 15.5% said they were used very often and 15.5% said they were rarely used. Public Health Programme in its adoption of the Problem- based learning approach places the reason for needing to know something. That is, its practical application first which ultimately stimulates the student to learn. This is in line with Maudsley's views of 2001. Lecture overviews were the next most used of these other methods with 33.0% and 34.0% saying that they were used often and very often, respectively.

Handout notes were also commonly used as 15.5% of the students reported that they were used often and very often in each case. Hand - outs are printed notes prepared by facilitators and given to students. This is a popular method used. As much as its use enhances understanding of the content, this method is more facilitator - centred than student - centred which contradicts Innovative Instructional Methods. Assignments were often and very often used according to 32.0% and 16.5% of the students, respectively. Assignments always form part of the teaching / learning process. This is done through extra work on content covered or to be covered being given to students by the lecturers. It allows for students to study on their own being one of the main features of innovative instructional methods. Assignments enable the facilitator to gauge the learners' understanding of the concepts and give them feedback on their academic progress.

PowerPoint presentations were the least used as only 15.5% of the student respondents said they were often used and very often used in each case. Power Point presentation requires the use of computer or laptop and LCD projectors. Availability of few LCD projectors does not allow for much use of power presentation as an innovative method of instruction. Educational trips were also often used according to 33.0% and another 16.5% who said they were used very often. The students also indicated that field study was often (48.5%) used. Community - Based Education and Service (COBES) approach which is a mandatory requirement of the School of Public Health requires sending students under supervision to communities (environment) in which they are expected

to work when they graduate. This therefore explains the use of field study at 48.5%. Question and answer method was also used often according to 32.0%.This method cuts across all instructional methods whether innovative or non- innovative. It is used to complement and therefore enhance the teaching / learning process. Only 15.5% of the students said teacher-student directed learning was used very often. A similar portion of the students (15.5%) also said that the internet or email of notes was used often. This shows that these methods were not very popular. Library use (16.5%) and slides (15.5%) were also used very often.

Overally, other methods mentioned apart from Innovative Instructional Methods are used. This indicates that Innovative Instructional Methods have not fully taken root in the school of Public Health though they have been embraced.

The second objective of the study also to establish the extent of the use of innovative instructional methods in the implementation of the Public Health Programme. The lecturers were consequently asked to indicate the extent of the use of the listed innovative instructional methods. The findings were as presented in Table 4.28.

Table 4.28: The Extent of Use of Innovative Instructional Methods in Teaching of Public Health Programme

Response	Frequency	Percentage
Not at all	0	0.0
Least extent	0	0.0
Some extent	15	57.7
Great extent	11	42.3
Total	**26**	**100.0**

From Table 4.28, majority, 15(57.7%), of the lecturer respondents reported that innovative instructional methods were used to some extent while 11(42.3%) of them said the methods were used to a great extent. From this finding, it is worth noting that innovative instructional methods were at least put to use by the lecturers. Therefore, it is important to determine what influences the extent of use of innovative instructional methods in implementation of public health programme. In order to determine this, the lecturers were further asked to give their explanations for extent of use they indicated in the above item.

Those who indicated that the innovative instructional methods were used to some extent gave the following explanations: Lack of familiarity with innovative instructional methods; not all lecturers and departments use them; Lecture method has become the norm; they are not the only methods in use; not all innovative instructional methods are solely used; some innovative methods only suit certain units; not all innovative instructional methods are used in teaching Public Health Programme; other methods are used to enhance student interaction; competition with world technology and new innovations and being a school requirement.

The lecturers responses on the other side who said that innovative instructional methods were used to a great extent gave the following explanations for their responses: Methods make learning student - centred; to enhance understanding of teaching content; Innovative Instructional Methods are quite handy;; these are the most common methods in the School of Public Health; All lecturers are properly inducted to Problem – Based Learning compared to other methods; Problem - Based Learning is most suited to teaching Public Health Programme, given that public health affects all people. The lecturers' responses on the other side bring out reasons as to why innovative instructional methods should actually be used in implementation of Public health programme.

To further assess the application of innovative instructional methods in the implementation of Public Health Programme in the School of Public Health, the Dean and Heads of Department views on this were sought. The responses to this item by the Dean and Heads of Departments are shown in Table 4.29.

Table 4.29: Innovative instructional methods as used in implementation of Public Health Programme

Response	Frequency	Percentage
Yes	5	83.0
No	1	17.0
Total	6	100.0

As indicated in Table 4.29 above, all, 6(83.0%), of the respondents affirmed that innovative instructional methods were used in implementation of Public Health Programme.

The study also sought to establish among the Heads of Departments and the Dean, the extent of use of innovative instructional methods in the implementation of the Public Health Programme. In relation to this, respondents were asked to indicate the extent of use of the listed innovative instructional methods. The respondents' responses are presented in Table 4.30.

Table 4.30: The Extent of Use of Innovative Instructional Methods in Teaching of Public Health Programme

Response	Frequency	Percentage
Least extent	1	16
Some extent	3	50
Great extent	2	34
Total	**6**	**100.0**

Half, 3(50%), of the respondents reported that innovative instructional methods were used to some extent while only 16% of them said the methods were used to a least extent. These responses indicate that the innovative instructional methods were at least put to use by the lecturers as there was even no response for the methods not being used at all.

The study further sought to establish whether lecturers incorporated instructional media resources whenever they used innovative instructional methods. As shown in table 4.30, the majority, 20 (76.9%) of the lecturers said instructional media resources were used alongside with innovative instructional methods. Nevertheless, 6 (23.1%) of them said instructional media resources were never used along with innovative instructional methods. For implementation of any one instructional method, even in traditional methods, media resources are always used. This is so because media refers to all means of communication. Therefore the respondents who indicated media resources as never used may not understand what media implies.

Table 4.31: Use of Media Resources in Innovative Instructional Methods

Response	Frequency	Percentage
Yes	20	76.9
No	6	23.1
Total	**26**	**100.0**

The lecturers who responded in the affirmative that media resources were used in innovative instructional methods were further probed to indicate some of the media resources that had been used in the implementation of the Public Health Programme. Their responses to this follow-up item were as summarized in Table 4.32.

Table 4.32: Media Resources applied with Innovative Instructional Methods

Response	Frequency	Percentage
Internet	14	53.8
Laptop / computers	20	76.9
LiquidCrystal Display (LCD) projectors	25	96.2
White boards and markers	14	53.8
Flip charts	13	50.0
e – learning	11	42.3
Laboratory specimens	12	46.2
Videos	11	42.3
Pictures, pamphlets, posters	11	42.3

As shown in the Table 4.32, most of the lecturers, 25(96.2%), said LCD projectors or power points were used along with innovative instructional methods. A reasonably large number of them, 20(76.9%), also said computers were used. Over half of the respondents, 14(53.8%), said internet was used and a similar number of lecturers mentioned whiteboards and whiteboard markers as the media resources used with innovative instructional methods. However, half, 13(50.0%), of the lecturer respondents indicated flip charts were used, 12(46.2%) indicated laboratory specimens were used while a consistent number of 11(42.3%), in each case, indicated the use of e-learning tools, videos and pictures, pamphlets and posters. e– learning is applicable mostly with distance learning. However, Public Health is not yet offered through e – learning in Moi University.

Laboratory specimens are selectively used for some courses. Videos, Pamplets, charts, posters may not be appealing to students hence not popularly used. LCD projector is the most popularly used media resource by the lecturers given that it blends the traditional lecture and demonstration methods that were used together with innovative

instructional methods. The LCD projector as a media resource can be conveniently used in the instruction of all the courses in the public health programme. This medium is a modification of flip chart. The other media with less than 50% could be attributed to their limited accessibility.

The study further sought to establish the extent of use of media resources in innovative instructional methods in teaching of the Public Health Programme. The respondent's responses were as presented in the Table 4.33.

Table 4.33: Extent of Use of Media Resources in Innovative Instructional Methods

Response	Frequency	Percentage
Not at all	0	0.0
Least extent	5	19.2
Some extent	14	53.8
Great extent	7	26.9
Total	**26**	**100.0**

Majority of the lecturers, 14(53.8%), said that media resources were used to some extent alongside other innovative instructional methods. On the other hand, 7(26.9%) said the media resources were used to a great extent while only 5(19.2%) said the media were used to a least extent. These findings show that media resources were used in innovative instructional methods though not to a great extent. This could be attributed to lecturers not being trained in media education.

The lecturers were further asked to give explanations for their responses on the extent of use of media resources in innovative instructional methods. Those who said media resources were used to a least extent gave the following explanations: Media resources are not popular to use; Media resources not enough; Media resources are not readily available. Not all users are conversant with media resources; Media resources are inadequate and large numbers of students.

The lecturer - respondents who said media resources were used to some extent gave the following explanations: Limited quantity of media resources; Lecturers not conversant with varied forms of media resources and their use in instruction; Inadequate support

personnel such as technicians; Cost of media resources and limited facilities for large student populations.

Lastly, those who said media resources were used to a great extent gave the following explanations: Most topics require the use of instructional media to foster learners' understanding of content; they help make teaching easier; Media resources promote quick access to information, retrieval and manipulation to information and more information is available in media publications. Media resources are a tangible form through which learning can take place. Through these resources learners understand the concepts via audio – visual means. This greatly enhances learning. These explanations are in line with the view by Kafu (1976) and Lee (2008) that as advanced organizers, media resources play an appropriate role as a supplemental supporter of instructional methods. In support of these view, Heinich *et al*. (2002) states that the most common use of media in an instructional situation is for supplemental support of the instructor in the classroom to enhance learning. Similarly, Lee (2011) indicated that course material on websites or the intern*et al*lows learners to engage in asynchronous learning and study at a time and location they prefer and to obtain the study material very quickly. Lee also says that students are more motivated to learn when they are interested in the subject matter, which can be enhanced by using technologies in the classroom and targeting the need for screens and digital material. In line with this, Lai (2008) argues that computers or other forms of technology can give students practice on core content and skills while the teacher can work with others, conduct assessments, or perform other tasks. The lecturers were also requested to list the teaching skills they used in innovative instructional methods. Their responses to this item were as summarized in Table 4.34.

Table 4.34: Teaching Skills used by Facilitators in Innovative Instructional Methods

Response	Frequency	Percentage
Management skills	11	42.3
Questioning skills	16	61.5
Discussion skills	11	42.3
Practical skills	12	46.2
Communication skills	18	69.2
Writing skills	11	42.3
Presentation skills	12	46.2

Mentoring skills	12	46.2
Research skills	11	42.3
ICT skills	14	53.8
Listening skills	11	42.3

The results as presented in Table 4.34 show that the majority, 18(69.2%), of the lecturers used communication skills with innovative instructional methods. An equally large proportion, 16(61.5%), of the lecturers used questioning skills with innovative instructional methods, while slightly over half, 14(53.8%), of the lecturers indicated ICT skills. A total of 12(46.2%) lecturers indicated, in each case, practical skills, presentation skills and mentoring skills. Lastly, 11(42.3%) of the lecturers in each case indicated the following skills: Management skills, discussion skills, writing skills, research skills and listening skills.

These findings concur with those of Mutema *et al*. (1992) who note that the application of innovative learning methods and experiences require the teacher to apply a number of teaching skills. These skills include: facilitating the learner to learn; advising the learner on important issues; guiding the learner to make appropriate decisions; informing the learner of important facts or processes; participating in the learner's learning process, and withdrawing from the learning scene to give the learner an opportunity to direct his learning.

The study further sought to establish the extent to which innovative methods were used by lecturers in evaluation during implementation of the Public Health Programme. To achieve this objective, the lecturers were asked to indicate whether or not they knew about any innovative methods used in evaluation of Public health programme. Their responses were as indicated in Table 4.35.

Table 4.35: Lecturers' awareness on Innovative Methods used in Evaluation of Public Health Programme

Response	**Frequency**	**Percentage**
Yes	22	84.6
No	4	15.4
Total	**26**	**100.0**

The research results presented in Table 4.35 indicate that the majority, 22(84.6%), of the lecturers were aware that some innovative methods were used in evaluation of Public health programme while only 4 (15.4%) did not have such knowledge.

Those who said they knew that some innovative methods were used in evaluation of Public health programme were probed further to indicate some of these methods used in evaluation of public health programme. Their responses were as presented in Table 4.36.

Table 4.36: Innovative Methods used in Evaluation of Public Health Programme

Response	Frequency	Percentage
Report writing	16	61.5
Project documentation	16	61.5
Oral assessment	13	50.0
Field assessment	12	46.2
Practical examinations	11	42.3
Self-assessment especially by lecturers	11	42.3
Peer assessment	12	46.2
Multiple choice questions (MCQs)	13	50.0
Short-answer questions (SAQs)	12	46.2
Objective Structured Practical Examination	12	46.2
Student-tutor assessment	11	42.3
Long essay questions (LEQs)	12	46.2
Group and Individual presentations	11	42.3
Laboratory reports	12	46.2

As shown in Table 4.36, report writing and project documentation were each indicated by majority, 16(61.5%), of the lecturers as the innovative methods most frequently used in the evaluation of public health programme. This can be explained by the mandatory Problem - Based Learning (PBL) and Community Based Education and Service (COBES), approaches used in implementation of the public health programme. These two require students to document their projects and write a report. These were followed by oral assessments and multiple choice questions (MCQs) each of which was mentioned by half, 13(50.0%), of the lecturer respondents.

The other methods mentioned by 12(46.2) lecturers in each case were: field assessments, peer assessments, short-answer questions (SAQs), Objective Structured Practical Examination (OSCPE), long-essay questions (LEQs) and laboratory reports.

The rest of the methods, indicated by 11(42.3%) lecturers each, were: practical examinations, lecturers' self-assessment, student-tutor assessments, group and individual presentations.

Report writing and project documentation have a higher percentage as compared to other methods this is attributed to the public health programme course requirements. The field studies carried out requires a report to be written at the end. When students go to the field they pick on a project and therefore, have also to document their findings. The methods with less than 50% frequency are applied only in some courses like electives. All in all the evaluation methods used should focus on all the skills including communication, writing and practical skills. This gives an overall view of the student's preparedness in handling public health issues.

The students were also asked to identify the methods used in the assessment of innovative instructional methods. Their responses were as summarized in Table 4.37 below.

Table 4.37: Methods used in the Assessment of Innovative Instructional Methods

Innovative instructional method	2nd Yr	3rd Yr	4th Yr	Total	Percentage
Small Group Tutorial (SGT)	23	28	29	80	77.7
Small Group Discussions (SGDs)	26	25	28	79	76.7
Problem-Based Learning (PBL)	24	32	27	83	80.6
Community-Based Education and Service (COBES)	25	36	28	89	86.4
Computer-Assisted Instruction (CAI)	19	16	16	51	49.5
Computer Assisted Assessment (CAA)	19	16	17	52	50.5
E-Learning	20	18	18	56	54.4
Self-Directed Learning (SDL)	22	26	26	74	71.8
Independent Study (IS)	22	23	27	72	69.9
Electives	22	26	25	73	70.9

As indicated in Table 4.37, Community Based Education and Service (COBES) is the most used method in assessment at 86.4% followed by Problem - Based Learning (PBL). Public Health Programme deals with issues that affect human population at different levels including community level. The students as they undertake their studies

are send to the communities for experience on handling Public health issues. Most of their assessment is based on the activities done and reports written while undertaking their attachment in the communities.

Computer Assisted Instruction (CAI) and Computer Assisted Assessment (CAA) were the least used in assessment with 49.5% and 50.5% respectively. These two call for availability of modern technologies like computers and their related soft - wares for all the facilitators and the technical knowhow of handling them. The needed computers may not be available let alone being enough. The facilitators may not be very conversant with the special programmes required for this kind of assessment. That is lecturers may lack the required expertise.

Besides this, the students were asked to identify other methods used in the evaluation of innovative instructional methods in their school their established views were as presented in Table 4.38.

Table 4.38: Other Methods used in the Evaluation of Innovative Instructional Methods

Suggestions Per Year	**2nd Yr**	**3rd Yr**	**4th Yr**	**%**
Class presentations	15	21	17	51
Report writings and presentations (project)	13	16	17	45
Research	13	16	16	44
Practical tests	16	18	20	52
Examinations (end of semester and end of year)	22	26	17	63
Continuous assessment tests (both take-aways and sit-ins)	20	25	17	60
Assignments	15	19	16	49
Questionnaires	13	16	17	45
Tutorial assessment sheet	11	14	15	39

From Table 4.38, examinations (End of Semester and End of Year) and Continuous Assessment Tests (both take away and sit - ins) are the other most used methods across all the classes in the evaluation of innovative instructional methods. This can be attributed to the fact that they are the conventional methods of assessment in universities. Tutorial assessment sheets are the least used methods of assessment at this level as they are more used at graduate level.

Though Continuous Assessment Tests (CAT), End of Semester Exams (ESE) and End of Year Exams (EYE) are considered conventional methods of assessment, they are not innovative in nature. Hence the need to devise innovative methods of assessment and incorporate them in the evaluation programmes.

The lecturer - respondents were further asked to indicate the extent to which the innovative methods were used in the evaluation of the Public health programme. Their ratings were established as presented in Table 4.39.

Table 4.39: Extent of Use of Innovative Methods in Programme Evaluation

Response	Frequency	Percentage
Not at all	0	0.0
Least extent	8	30.8
Some extent	12	46.2
Great extent	6	23.1
Total	**26**	**100.0**

As indicated in the Table 4.39, all the respondents agreed that innovative methods were at least used in the evaluation of the Public health programme but in varied degrees. Of the lecturer - respondents 12(46.2%) said the methods were used to some extent, 8(30.8%) said the methods were used to a least extent and (23.1%) said they were used to a great extent.

Those who said the innovative methods of evaluation were least used said traditional assessment methods like Continuous Assessment Tests (CATs) are preferred and innovative assessment methods are not taken seriously. The respondents who said the methods of evaluation were used to some extent said the methods were meant to give feed - back that is accurate and other methods of assessment are ideal. This view corroborates the findings of Potter *et al.* (2002) that in order to accurately measure implementation, programmers need to focus on three key areas: programme foundations, the implementation system, and programme monitoring. Lastly, those who said the innovative methods of evaluation were used to a great extent said most evaluations require technology to produce reliable out - comes and it is in keeping with the current trends. All in all, the use of Innovative Methods in evaluation depends on familiarity of the method with users and practical application of the method. If

Innovative Instructional Methods are used in teaching, similarly, Innovative approaches should be used in evaluation.

The lecturers were further probed to give explanations for the ratings they gave above. Their explanations were as follows; Those who said the innovative methods of evaluation were least used gave the following explanations: Traditional assessment methods like Continuos Assessment Tests (CATs) are preferred; Innovative assessment methods are not taken seriously; Innovative assessment methods may not be applicable to some units; Most students are evaluated on practical basis as per the course requirements; Established methods are preferred for example, end of semester and end of year exam because of institutional policies and practices.

The lecturer - respondents who said the innovative methods of evaluation were used to some extent gave the following explanations: To give feedback that is accurate; other methods of assessment are ideal. Innovative assessment methods only complement these ones; Most of the assessors are still stuck in the old methods, e.g. end of semester exams; Various levels of knowledge attitude and practice (KAP) are assessed, needing variety of methods; Most study results are based on field research; Innovative assessment methods not known by many lecturers; Popularity of or familiarity with traditional methods; Multiple Choice Questions (MCQs) are time consuming to construct and that it is not a must to use innovative methods to assess. Most of these responses do not fully support use of Innovative Methods of evaluation.

Lastly, those who said the innovative methods of evaluation were used to a great extent said it is in keeping with the current world technology and education trends. Evaluation cannot be complete without use of Information Communication Technology (ICT) which is a common phenomenon in all aspects of modern society.

4.5 Factors that Determine the Use of Innovative Instructional Methods

The third objective of the study was to identify the factors that determine the use of innovative instructional methods in the implementation of the Public Health Programme. To achieve this objective, the lecturers were first asked to list the minor and major factors they knew that influence the use of innovative instructional methods. The findings on this item are presented in Table 4.40.

Table 4.440: Factors that Influence the Use of Innovative Instructional Methods

Response	Frequency	Percentage
Minor Factors		
Attitude	15	57.7
Course requirements	11	42.3
Policy of the use of innovative methods	11	42.3
Learning environment	11	42.3
Experience	12	46.2
Availability of media resources	11	42.3
Time	11	42.3
Lack of commitment of lecturers	13	50.0
Inadequate lecture rooms	12	46.2
Lack of exposure in the use of the methods	12	46.2
Timetabling problems (e.g. clashing)	12	46.2
Lack of transport to the fields	11	42.3
Lack of feedback from students	11	42.3
Availability of personnel	11	42.3
Major Factors		
Knowledge level of innovative instructional Methods	13	50.0
Complexity of use of methods	11	42.3
Past successes of use in instructional methods	11	42.3
Limited/lack/inadequate media resources	14	53.8
Unavailability of media resources	15	57.7
Time	11	42.3
High students to lecturer ratio	15	57.7
Large student population	15	57.7
Lack of commitment	11	42.3
Different types of learners	11	42.3
Work overload	11	42.3
Cost of buying the instruments for use	12	46.2
Inadequate learning rooms	11	42.3
Lack or poor planning	11	42.3
Availability of facilities	12	46.2
School policy	12	46.2

4.5.2 Minor Factors

Table 4.41: Statistical analysis of factors that determine the implementation of Innovative Instructional Methods in Public Health Programme

Factor	P-value
Attitude	0.637
Course requirements	0.021
Policy of the use of innovative methods	0.049
Large student population	0.000
Experience	0.097
Availability of media resources	0.169
Time	0.021
Lack of commitment	0.003
Inadequate lecture rooms	0.097
Lack of exposure in use of methods	0.604
Timetabling problems	0.169
Lack of transport	0.000
Feedback from students	0.049

The following factors came out as statistically significant after linear regression was done: Course requirements, Policy on the use of innovative methods, High student to lecturer ratio, Time, Lack of commitment and Lack of transport.

However, large student population and Lack of transport came out as the strongest with a P value of 0.000. This can be interpreted to mean large student population and lack of transport really determines the implementation of innovative instructional methods. The determination in this case would be negative since large student population cannot be effectively handled through innovative instructional methods that are characterized by small student population. Innovative instructional methods like Community Based Education and Service (COBES) and Field Study require of the students to go to the communities / field in the course of their study. Lack of transport hampers this from taking place.

Factors such as disciplinary differences, year of study, and amount of instructional variety were posited as possibly affecting students' willingness to engage with nnovative instructional methods. Adequate finance is another very important resource

needed to facilitate implementation of the instructional method. The programme will require adequate funding to sustain its activities.

Table 4.42: Major Factors

Factor	P-value
Knowledge levels of innovative model	0.169
Complexity of use of methods	0.021
Past success of use in instructional methods	0.087
Limited media resources	0.271
Unavailability of media resources	0.087
Time	0.049
High Student to lecturer ratio	0.000
Lack of commitment	0.049
Different type of learners	0.021
Work overload	0.049
Cost	0.003
Inadequate learning rooms	0.049
Poor planning	0.049
Availability of facilities	0.003
School policy	0.003

The following factors came out as statistically significant after linear regression was done. They were each used as the dependent variable against department as the independent variable: Complexity of use of methods, Time, Large student population, Lack of commitment, Different types of learners, Work overload, Cost, Inadequate learning rooms, Poor planning, Availability of facilities and School policy.

However, High Student to lecturer ratio came out with the strongest significance with a P value of 0.000. Studies indicate that “resource out - lay or initial investment can often be used to predict implementation of an instructional method’’ (Fullan *et al.*, 1975). Resource availability over both the long term and short term basis are important to the effective implementation effort, such as a Health Curriculum which has at its center, a resource – based activity oriented program. There has to be proper resource procurement, resource organization and maximal use of resources. The availability and

quality of resource material and the availability of appropriate facilities have a great influence on curriculum implementation. Adequate finance is another very important resource needed to facilitate implementation of the instructional method. The programme will require adequate funding to sustain its activities.

Among the minor factors provided by respondents, the most indicated one 15(57.7%) was that of attitude of the lecturers and students towards innovative methods. Half, 13(50.0%), of the lecturers indicated lack of commitment. Other minor factors, each of which was indicated by 12(46.2%) lecturers, were: High student - lecturer ratio; experience; inadequate lecture rooms; lack of exposure in the use of the method, and timetabling problems such as clashing.

The other minor factors, which were also indicated by 11(42.3%) of the lecturers, were: Course requirements; policy on the use of innovative methods; learning environment; availability of resources; time; lack of transport to the fields; feedback from students, and availability of personnel. Human resource including teachers, technical and administrative and support staff form another important support needed for implementation. There should be sufficient staff to deliver and support the delivery and assessment of the curriculum. Staff should be appropriately skilled (in pedagogical and technical areas), be qualified enough and be aware not only of their own areas of the curriculum but also of the curriculum as a whole in order that they can contextualize the learners' learning experiences (Fullan, 1995).

There is need for time for teachers to familiarize themselves with new materials and methods and to reflect and work on problems of implementation both individually and collectively (Fullan *et al*., 1975). More time is needed to plan, develop teaching materials, try out new techniques and rethink instructional practices. Teachers need enough time to develop their own understanding of the subject they are required to teach.

Attitude, though a minor factor plays a crucial role in use of innovative instructional methods. A positive attitude among the lecturers and students would support the implementation of innovative instructional methods but a negative attitude would challenge the use of innovative instructional methods in public health programme. Lecturer's attitudes whether positive or negative, towards innovative instructional

methods would impact on student's attitudes as adults have an influence on those who look up to them.

Time is also very important as echoed from Fullan *et al*. (1975) who suggested that teachers need time to familiarize themselves with new materials and methods and to reflect and work on problems of implementation both individually and collectively. Proper planning of the available time would enhance implementation of innovative instructional methods as the facilitator would adequately prepare the teaching and learning materials.

Of the major factors that influence the use of innovative instructional methods, 15(57.7%) lecturers in each case indicated unavailability of media resources and High Student to lecturer ratio. Majority of lecturer - respondents, 14(53.8%) indicated limited or lack of media resources. A 50% response of the lecturers indicated knowledge level of innovative instructional methods as a factor that influences use of the method. Prior knowledge from previous courses significantly influenced student achievement. Procedural knowledge was especially related to student achievement. Instructors and students had mainly positive reactions towards the prior-knowledge tests. Students' prior knowledge should be taken into consideration in instructional design and curriculum planning. (Chang Zhu *et al.*, 2013)

A good number, 12(46.2%), of the lecturers each indicated the following as major factors: Lack of motivation to use the methods; cost of buying the instruments for use; availability of facilities, and school policy. Lastly, 11(42.3%), of the lecturers each gave the following as major factors: Complexity of use of methods; past successes of use in instructional methods; time; lack of commitment; different types of learners; work overload; inadequate learning rooms, lack or poor planning. Teaching rooms, office space, social and study space – there should be adequate provision to accommodate learners at all stages of the program as well as social and study space for students to spend time outside the classroom. There should also be sufficient space for teachers to prepare teaching and meet with students.

Teaching rooms, office space, social and study space – there should be adequate provision to accommodate learners at all stages of the program as well as social and

study space for students to spend time outside the classroom. There should also be sufficient space for teachers to prepare teaching and meet with students.

Media resources are an important requirement in the use of innovative instructional methods. Media, which is a form of communication, enhances the teaching and learning process Therefore their limited numbers could adversely hinder the use of these methods in implementation of public health curriculum.

From the definition of innovative instructional method which refers to pedagogical practices that promote active and independent learning processes and encourage project based learning, it is clear that innovative instructional methods work well with small number of learners. Therefore, large student population as indicated by more than half of lecturers can be a big concern which can influence use of innovative instructional in a negative way. Generally, this model of instruction is suitable for small classes.

In order to establish factors that determine the use of Innovative Instructional Methods in Public Health Programme, the students were asked to indicate the extent of availability and use of instructional materials in implementation of Public Health Programme. Their responses are indicated in Table 4.43.

Table 4.43: Extent of Availability and Use of Instructional Materials in Implementation of Public Health Programme

Instructional Resources	Available			Not available			Adequate			Not Adequate			Used			Not used		
	2nd Yr	3rd Yr	4th Yr	2nd Yr	3rd Yr	4th Yr	2nd Yr	3rd Yr	4th Yr	2nd Yr	3rd Yr	4th Yr	2nd Yr	3rd Yr	4th Yr	2nd Yr	3rd Yr	4th Yr
Human (Lecturers)	20	25	21				11	17	12	8	8	8	14	21	15			
Teaching/Learning Rooms	20	24	16				9	10	7	9	16	16	13	19	12			
Laboratories	19	24	16				8	12	8	10	15	14	11	18	12			
Library	21	23	20				13	18	14	6	9	8	11	19	11	7	6	9
Textbooks	19	19	16	6	6	7	8	10	8	9	20	12	12	16	11	6	8	9
Human (Resource persons)	16	12	20	7	9	6	10	14	12	9	10	11	10	10	12	9	10	6
Overhead projector	21	21	19				10	16	12	20	17	19	14	18	13			
Handouts	16	22	15				8	14	12	10	14	8	13	20	10			
Internet services	15	18	18	10	8	7	9	12	11	10	15	8	11	18	13	8	6	9

From Table 4.43, all the listed instructional materials were available and used in the implementation of Public Health Programme, though most were not adequate. Some students across all the classes indicated that they do not make use of the Library, textbooks and resource persons. This could be attributed to the limited sitting space available in the Library and outdated text books. They preferred searching for information from the internet which they said was faster and gave more current information and where there is no space challenge. Overhead projector was the main instructional material that was not adequate. This could limit the use of innovative instructional methods like overview lecture method, project presentation and demonstration among others that require the use of an Overhead projector.

Table 4.44: Statistical Analysis on Availability of Instructional Materials Vs. Year of Study

Variable	P value
Teaching rooms	0.385
Laboratories	0.441
Library	0.887
Textbooks	0.663
Overhead projector	0.661
Handouts	0.567
Internet access	0.781

This Table shows the most available materials are the teaching rooms with the least available being the lecturers. Availability of many teaching rooms is a good indicator for implementation of innovative instructional methods. Many rooms would allow for students to sit in small groups for discussion or tutorial sessions with the facilitator. In Programme implementation, the central government must also provide physical facilities such as classrooms, laboratories, workshops, libraries and sports fields in order to create an environment in which implementation of an instructional method can take place (Nkomo , 1995). The availability and quality of resource material and the availability of appropriate facilities have a great influence on curriculum implementation.

Table 4.45: Statistical Analysis on Adequacy of Instructional Materials vs. Year of study

Variable	P value
Lecturers	0.634
Teaching rooms	0.144
Laboratories	0.744
Library	0.838
Textbooks	0.979
Human resource	0.869
Overhead projector	0.642
Handouts	0.510
Internet access	0.899

This table shows the most adequate materials are the teaching rooms with the least adequate being the textbooks. For the officially designed curriculum to be fully implemented as per plan, the government or Ministry of Education should supply schools with adequate resource materials such as text - books and stationery in order to enable teachers and learners to play their role satisfactorily in the curriculum implementation process.

Table 4.46: Statistical Analysis on Use of Instructional Materials vs. Year of Study

Variable	P value
Lecturers	0.575
Teaching rooms	0.490
Laboratories	0.481
Library	0.270
Textbooks	0.606
Human resource	0.659
Overhead projector	0.798
Handouts	0.162
Internet access	0.534

This Table shows the most used materials are the handouts with the least used being the projector Handouts are printed notes to be used by lecturers and students. These are popularly used because they contain a wide range of information from all disciplines,

are relatively permanent and allow the student to independently study. Independent Study is one of the innovative instructional methods.

Table 4.47: Other Factors that Influence Use of Innovative Instructional Methods

Factor	**2nd Yr**	**3rd Yr**	**4th Yr**	**%**
Emergency situations, e.g. outbreak of contagious disease	15	17	16	47
ICT-related issues (being ICT savvy, modern equipment, PowerPoint)	16	19	16	50
Time allocation in the time-table, time-table clashes	17	16	16	48
Monitoring or supervision	16	17	15	47
Time available	17	16	16	84
Type of course or content	16	15	17	47
Students' attitudes towards innovative methods	16	16	18	49
Attitudes of lecturers towards innovative methods	15	16	18	48
Varied levels of knowledge on innovative methods	16	17	16	48
Lecturers' preferences	16	17	18	50
Students' preferences	16	16	17	48
Need for field experience	13	16	19	47

The lecturer - respondents were further asked to explain how the above major and minor factors affected the use of instructional methods in the implementation of Public Health Programme. Their responses are presented in Table 4.48.

Table 4.48: How Minor and Major Factors affect the Use of Innovative Instructional Methods

Response	Frequency	Percentage
Hamper/interfere with implementation of instructional methods	18	69.2
Lowers student motivation	11	42.3
Slow down implementation	11	42.3
Lack of technical skills reduces progress in use of IIM	12	46.2
Large numbers of students make it difficult to effectively manage classes and resources	12	46.2
Non-compliance with the policy on IIM	12	46.2
Past successes in use of IIM and availability of resources enhances students' mastery of content	11	42.3
Conducive environment contributes to better delivery of learning through instructional methods	11	42.3
Trained personnel contributes to successful application of methods	11	42.3
Contributes to poor training outcomes, e.g. improperly trained graduands	13	50.0
Poor attitudes toward the methods among lecturers and students leads to low usage	11	42.3
Lack of facilities hinders application of methods and delivery of content	13	50.0

From the results in Table 4.48, the majority, 18(69.2%), of the lecturer - respondents indicated that factors generally interfered with the effectiveness of implementation of instructional methods. Other explanations given by the respondents included: Lack of resources and trained personnel which contribute to poor training out – comes such as production of improperly trained graduands, 13(50.0%); lack of facilities which hinder application of methods and delivery of content, 13(50.0%); lack of technical skills that reduce progress in use of innovative instructional methods, 12(46.2%); large numbers of students make it difficult to effectively manage classes and resources, 12(46.2%); non-compliance with the policy on innovative instructional methods, 12(46.2%), leads

to laxity in use of the methods; negative factors lowers student motivation, 11(42.3%); slow down implementation, 11(42.3%); past successes in use of innovative instructional methods and availability of resources enhances students' mastery of content, 11(42.3%); conducive environment contributes to better delivery of learning through instructional methods, 11(42.3%); trained personnel contribute to successful application of methods, 11(42.3%), and poor attitudes toward the methods among lecturers and students leads to low usage, 11(42.3%).

The findings about past successes in use of innovative instructional methods and availability of resources enhancing students' mastery of content are also highlighted by Lee (2008) who stresses on the availability of instructional media as one of the factors that contribute to satisfaction among learners.

All in all, both the minor and major factors influence use of innovative instructional in implementation of public health programme. Most of the factors tend to hinder use of innovative instructional methods in implementation of public health programme. Among the many extrinsic factors identified that may impede curriculum change are adequacy of resources, time factor, school ethos and professional support. The intrinsic factors are; professional knowledge, professional adequacy and professional interest and motivation (Fullan *et. al.,* 1977).

These factors help to shape the teaching and learning context in which innovative instructional methods are applied. According to Scmidt (1993), acquisition of knowledge is indeed an active process, and that learning in a relevant context enables more efficient acquisition and better retention of knowledge.

The researcher observed physical facilities within the school of Public Health and summarized the findings as follows; the facilities which included classrooms, laboratories, administrative and departmental offices were not quite adequate. Some of the rooms were shared among departmental members; classrooms were used interchangeably among students. Most of the facilities were located within the school of Public Health premises save for the library that was outside the school of Public Health compound. All the facilities were in good condition except for some buses that appeared old. The facilities were appropriate for the implementation of Public Health Programme.

The Dean and Heads of Departments were interviewed in order to identify the factors that determine the use of innovative instructional methods in the implementation of the Public Health Programme. To achieve this objective, the respondents were asked to mention some of the factors they knew that influenced the use of innovative instructional methods. The research findings to this item included the attitudes of students and lecturers, lack of commitment, high students to lecturer ratio; experience; inadequate lecture rooms; lack of exposure in the use of the method, clashing time – tables, course requirements; policy on the use of innovative methods; learning environment; availability of resources; time; lack of transport to the fields; feed- back from students and availability of personnel.

The following are some of the important factors to lecturers involved in implementation of innovative instructional method Staff development meetings to include the members of the development team; Information on any revisions being planned in their subject; Participation in decision making about learning outcomes of the course; Staff development meeting with the curriculum team to give feedback;

4.5.3 Challenges in the Use of Innovative Instructional Methods in Implementation of Public Health Programme

The fourth objective of the study sought to identify the challenges experienced in the use of innovative instructional methods in the implementation of Public Health Programme. In relation to this objective, the lecturers were asked to state whether there were some challenges experienced in the use of innovative instructional methods. The established responses from these respondents are presented in Table 4.49.

Table 4.49: Whether there are some Challenges experienced in the use of Innovative Instructional Methods in the Implementation of the Public Health Programme

Response	Frequency	Percentage
Yes	26	100.0
No	0	0.0
Total	**26**	**100.0**

As indicated in Table 4.49, all the lecturer – respondents 26(100.0%) indicated that there were challenges in the use of innovative instructional methods in the

implementation of the Public Health Programe. When asked to state some of the challenges experienced, respondents stated the challenges presented in Table 4.50.

Table 4.50: Some of the Challenges experienced in the Use of Innovative Instructional Methods

Response	Frequency	Percentage
Limited exposure to innovative instructional methods	18	69.2
Limited experience in the use of instructional methods	12	46.2
Limited/inadequate instructional resources	16	61.5
Lack of transport to the field	12	46.2
Limited facilities, e.g. rooms, internet access	14	53.8
Occasional power failures	12	46.2
Shortage of trained personnel	13	50.0
Lack of commitment among lecturers and students	12	46.2
Timetabling, e.g. clash of classes in the same venue	11	42.3
Large student populations	15	57.7
Lack of regular training or in-service training among facilitators	11	42.3
Lack of regular review of problems	11	42.3
Limited LCD projectors	11	42.3
Student absenteeism	11	42.3
Lack of knowledge of ICT	11	42.3
Inadequate financial facilitation	11	42.3
Overworked lecturers	11	42.3

Table 4.50 clearly shows that limited exposure to innovative instructional methods was mentioned by a majority, 18(69.2%), of the lecturers as a challenge in the use of innovative instructional methods. If the lecturers are not introduced to the methods and inducted to use them, they face a challenge trying to adapt to them. In the course of their teaching if emphasis is not laid on using them, they may choose the methods that they are familiar with. Lack of awareness and knowledge ability on innovative instructional methods also hinder implementation of innovative instructional methods. Similarly, the acceptance of these methods could have been slow.

Limited or inadequate instructional resources were the second most noted problem as indicated by 16(61.5%). Other challenges noted included large student populations, 15(57.7%), limited rooms and facilities, e.g. internet access and 14(53.8%), shortage of

trained personnel, 13(50.0%). Innovative Instructional Methods were introduced in the school of Health Sciences in the 1990's and student admissions were strictly controlled. With the current increased enrolment student, innovative instructional methods may not be easily applied unless lecturer numbers are also increased. A total of 12(46.2%), in each case, indicated limited experience in the use of innovative instructional methods. New or inexperienced teachers could find it difficult to cope with the nature of implementation, perhaps feeling a need for more detailed direction as to what they should teach. Staffs who have been teaching perhaps for many years in a more traditional way might be apathetic or resistant to the idea of wholesale change. Lack of skills among the implementers hinders implementation of a method.

Lack of transport to fieldwork and lack of commitment among lecturers and students each had 46.2% response of the challenges experienced. Other challenges, each of which was indicated by 11(42.3%) of the lecturers, were: timetabling challenges for example clash of classes in the same venue. The timetable could be seen as a particular constraint to implementing a given policy. This could happen in the event of time allocations and venues for lessons clashing due to limited facilities.

Lack of regular training or in-service training among facilitators; lack of regular review of problems; limited financial facilitation, and overworked lecturers each had a 42.3% response. These findings agree with those of South (2000) who identifies the following as the main challenges to implementation of innovative instructional methods namely: core cost, storing, provision of infrastructure, creating meta-data for each object and maintaining standards of learning objects. Besides this, the lecturers were further asked to rate these challenges from the most to the least serious ones. Table 4.51 summarizes the ratings by lecturer- respondents.

Table 4.51: Rating of the Challenges of Implementing Innovative Instructional Methods from the Most Serious to Least Serious

Challenges	Most serious		Least serious	
	Frequency	Percentage	Frequency	Percentage
Large classes	13	50.0		
Limited funding	13	50.0		
Lack of facilities, e.g. rooms, research centre	13	50.0	11	42.3
Negligence and laissez faire attitude of lecturers	11	42.3		
Fewer members of staff			11	42.3
Limited exposure to innovative instructional methods	11	42.3		
Lack of transport for field work			11	42.3
Lack of technical knowledge on the use of innovative instructional methods			12	46.2
Limited LCD projectors	11	42.3		
Lack of commitment			11	42.3
Limited knowledge of ICT	11	42.3		

As shown in Table 4.51, the most serious challenges were mainly large classes, 13(50.0%); limited funding, 13(50.0%); lack of facilities for example rooms, research centre, 13(50.0%) and lack of technical knowledge in the use of instructional methods (46.2%). Other factors listed as most serious at 11(42.3%) each were lack of training for personnel; negligence and laissez faire attitude of lecturers; limited exposure of lecturers to innovative instructional methods; limited LCD projectors; lack of commitment by lecturers and limited knowledge of ICT. Limited exposure to innovative instructional methods and lack of technical knowledge on the use of innovative instructional methods is a challenge emanating from the training and development of the staff. Innovative Instructional methods may not have been part of

the curriculum of the facilitators; therefore they could not have had enough exposure in them. An induction to the staff once is not enough to enable the facilitators be confident with the methods.

Large student population being rated as most serious has implications on use of innovative instructional methods. These methods are learner - focused, therefore when the population is large the facilitator may not give adequate attention to individual learners. Limited funding is also another serious challenge. The innovative methods require varied learning materials. Less financial allocation cannot allow for adequate acquisition of the learning materials.

The lecturers listed the following, both as serious and less serious challenges: Fewer members of staff, 11(42.3%), and lack of transport facilities for field work, 11(42.3%). Other pointed out challenges included, lack of facilities such as rooms, research centre, at 13(50.0%), and 11(42.3%) respectively. Limited number of staff falls under least serious challenges in the sense that it may not be the numbers that determine the use. Even few members of staff if well conversant with these methods of teaching could use them effectively. On the other hand large numbers of staff if not well conversant with them methods could fail to utilize them.

Table 4.52: Statistical analysis of challenges faced in the use of Innovative Instructional Methods in Public Health Programme

Model	Coefficients				
	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	2.309	.745		3.100	.005
Personnel Challenges	-2.000	1.263	-.926	-1.583	.128
Infrastructure Challenges	.600	.720	.270	.833	.414
Limited Knowledge	-014	1.547	.000	.000	1.000
Financial Challenges	1.545	1.143	.707	1.353	.191

Multivariate linear regression analysis was done to predict the relationship between challenges faced in the use of innovative instructional methods and the various departments. There was no statistical significance between the dependent and independent variables. However looking at the beta coefficients shows financial challenges as the strongest independent variable with 0.707 beta value. A standardized beta coefficient compares the strength of the effect of each individual independent variable to the dependent variable. The higher the absolute value of the beta coefficient, the stronger the effect.

The student - respondents were asked to indicate whether implementation of Public Health Programme using Innovative Instructional Methods was faced with challenges. Their responses are indicated in Table 4.53.

Table 4.53: Whether there are challenges in use of Innovative Instructional Methods

	2nd Yr.	**3rd Yr.**	**4th Yr.**	**%**
Yes	28	33	30	88
No	4	5	3	12

There are challenges in use of Innovative Instructional Methods as shown by 88% of the students' respondents. Only 12% indicated that there were no challenges in use of Innovative Instructional Methods. This number may not be quite clear on what challenges there could be experienced in use these methods. Otherwise, the use of Innovative Instructional Methods is faced with many challenges.

Table 4.54: Statistical Analysis of Challenges Faced By Students in the Use of Innovative Instruction Methods

Chi-Square Tests			
	Value	**Df**	**Asymp. Sig. (2-sided)**
Pearson Chi-Square	.288[a]	2	.866
Likelihood Ratio	.292	2	.864
Linear-by-Linear Association	.247	1	.619
N of Valid Cases	103		

A chi square test was done to determine the measure of association between year of study and whether there are challenges in the use of innovative instructional methods and the P-Value was 0.866. This result was not statistically significant at $p < 0.05$.

Table 4.55: Some of the Challenges faced in use of Innovative Instructional Methods

Challenge	2nd Yr	3rd Yr	4th Yr	%
Cost issues	17	18	16	50
Lecturers' lateness to class	16	17	18	50
Inadequate learning resources	16	18	16	48
Poor time management	16	16	17	48
Inadequate allocated time	16	17	17	49
Lack of knowledge or experience in the methods	18	17	16	50
Large class sizes	17	16	17	49
Less human resource personnel	16	16	18	49
Students' preference of familiar methods	16	16	17	48
Inadequate physical facilities (labs, classrooms)	16	20	18	52
Inadequate modern equipment	16	19	17	50
Lack of funding for field trips (transport)	16	18	17	50
Methods not familiar to students	19	16	15	49
Methods not practical	17	16	15	47
Inadequate textbooks in the library	15	18	18	50
Adapting to communities outside	16	17	15	47
Exposure to diseases and poor conditions	18	16	17	50
Poor internet services, Poor Wi-Fi connection	19	17	20	54

From table 4.55, several challenges faced in use of innovative instructional methods as viewed by students were highlighted. Among these challenges, Poor internet services, poor WI – Fi connection and physical facilities were among the main challenges faced. There is therefore need to address these challenges so as to improve the implementation of Public Health Programme using innovative methods.

Table 4.56: Statistical Analysis of Challenges Faced By Students across Years of Study in Implementation of Public Health Programme

Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	51.608[a]	2	.000
Likelihood Ratio	65.279	2	.000
Linear-by-Linear Association	39.712	1	.000
N of Valid Cases	103		

Symmetric Measures

			Value	Asymp. Error[a]	Std.Approx. T[b]	Approx. Sig.
Interval Interval	by	Pearson's R	.624	.067	8.024	.000[c]
Ordinal Ordinal	by	Spearman Correlation	.625	.072	8.055	.000[c]
N of Valid Cases			103			

A cross tabulation was done for chi square test and correlations to determine the measure of association between year of study and whether there are challenges in the use of innovative instructional methods. The P-Value of 0.000 for chi square shows there is a strong statistical significance at $p < 0.05$. Moreover the Pearson r and spearman correlation also show strong relationship between the variables at P value of 0.624 and 0.625 respectively. Logistic regression was also done to predict if challenges affect the use of innovative instructional methods and there was also a strong significance at P-value of 0.000 which confirms the presence of challenges in the use of innovative instructional methods.

The student - respondents were further asked to rate the listed challenges from the worst to the least challenge. The rated challenges are indicated in Table 4.57.

Table 4.57: Rating the Listed Challenges from the Least Challenge to the Most Challenge

Which is the worst challenge	2nd Yr	3rd Yr	4th Yr	%
Cost issues	17	16	18	50
Lecturers' lateness to class	16	17	18	50
Inadequate learning resources	16	18	16	49
Poor time management	16	16	17	48
Inadequate allocated time	17	16	17	49
Lack of knowledge or experience in the methods	16	16	16	47
Large class sizes	17	16	17	49
Less human resource personnel	16	17	15	47
Students' preference of familiar methods	16	16	17	48
Inadequate physical facilities	18	17	19	52
Inadequate modern equipment	16	18	17	50
Lack of funding for field / educational trips	16	18	17	50
Methods not familiar to students	19	16	17	50
Methods not practical	17	16	15	47
Inadequate textbooks in the library	15	17	15	46
Adapting to communities outside	16	17	15	47
Exposure to diseases and poor conditions	13	15	14	41
Poor internet service	19	17	18	52

From Table 4.57 above , poor internet service and inadequate physical facilities like lecture rooms, tutorial rooms and laboratories had the highest number of respondents as a challenge. Exposure to diseases and poor conditions was rated least as a challenge. All the other challenges had relatively similar number of respondents.

Internet service is one of the key elements in the use of Innovative Instructional Methods. Poor accessibility of the internet can therefore be a major challenge as indicated by student – respondents. Inadequate physical facilities like tutorial rooms are also a major challenge as thy limit where students can meet for small group discussions and tutorials which are among Innovative Instructional Methods. Exposure to diseases and poor conditions may only be experienced in some instances during fieldwork.

Furthermore, the students were required to suggest causes of the challenges. Their responses are as shown in Table 4.58.

Table 4.58: Causes of the Challenges Experienced in Use Of Innovative Instructional Method

Cause of Challenge	2nd Yr	3rd Yr	4th Yr	%
Excessive workload for lecturers	19	20	18	55
Poor management of time	19	18	17	52
Poor learning environment	16	18	16	49
Poor understanding of the methods	15	16	18	48
Improper induction on methods	19	17	17	51
Lack of follow-up on implementation of policy	16	17	16	48
Limited funding	18	19	21	56
Poor attitudes towards the methods among students	13	16	19	47
During exam times, students occupy most of the teaching rooms	14	16	15	44
Limited space in the college to facilitate building of more learning rooms and expanding the library.	15	16	17	47
Environmental factors, especially during field study	13	19	18	49
Proximity of ICT department to classrooms and laboratories	13	17	16	45

The major cause of the challenges was limited funding followed by excessive workload on lecturers. The students could have attributed some of the challenges noted in Table 4.55 like inadequate physical facilities in the library and limited or lack of funding for educational trips to limited funding. Most student respondents cited limited funding as this cause generally affects provision of learning materials and facilitation of students' and lecturers' field studies. Excessive workload on lecturers hinders application of innovative instructional methods as the lecturers may not have adequate time to prepare and, therefore, may resort to traditional methods like lecture method.

The causes are not limited to one source but emanate from students, lecturers, Administrators and the learning environment. Therefore, all these people have a role to play and can contribute either positively or negatively in the use of innovative instructional methods. But most importantly are the administrators who should understand the causes from the various sources of the challenges and address them in

order to facilitate the implementation of innovative instructional methods. These sentiments are echoed from Zhu (2014) who indicated that leadership has a great role to play in learning institutions. If the leadership initiates formulation of and implementation of Innovative Instructional Methods, then it can succeed. On the other hand, if administrators do not support Innovative Instructional Methods, then its adoption may not be realized.

The lecturers were further asked to identify the possible causes of the challenges they identified as affecting the use of innovative instructional methods and when the collected data was analyzed, the observations were as shown in Table 4.59.

Table 4.59: Lecturers' Responses on Possible Causes of the Challenges

Response	Frequency	Percentage
Poor preparation among tutors	11	42.3
Poor planning	17	65.4
Poor monitoring by Quality Assurance Department	15	57.7
Lack of trained personnel	11	42.3
Resistance to change	11	42.3
Limited in-service / refresher courses on ICT	11	42.3
Lack of commitment from staff to implement IIM	12	46.2
Poor use of available resources	11	42.3
Inadequate resources	15	57.7
Poor remuneration of staff	11	42.3
Lack of exposure to IIM	11	42.3

Majority, 17(65.4%), of the lecturers identified poor planning as a major cause of the challenges facing the use of innovative instructional methods in Public Health Programme. Other causes, each mentioned by 15(57.7%) lecturers, were poor monitoring by Quality Assessment Department and inadequate resources respectively. A total of 12(46.2%) lecturers attributed the challenges to general lack of commitment from staff to implement innovative instructional methods. The rest of the lecturers, 11(42.3%) in each case, identified poor preparation among tutors; lack of trained personnel; resistance to change; limited in-service/refresher courses on ICT; poor use of available resources; poor remuneration of staff and lack of exposure to innovative instructional methods as other causes.

Poor planning causes a challenge to implementation as there would be no clear roadmap to follow in the use of innovative instructional methods. In order for an instructional a method to be used effectively, there should be proper monitoring to inform its implementation and also point out any shortcomings. Poor monitoring by Quality Assessment Department poses a challenge as the facilitators would not discover or be informed of their mistakes in order to improve the use of innovative instructional methods.

Resistance to change from conventional instructional methods to innovative instructional methods causes a challenge to use of innovative instructional methods which calls for a shift from traditional instructional methods to innovative instructional methods. People resist change in implementation because they do not understand it; they simply do not follow what is being introduced. They do not understand where they are going. They are not clear as to what is required of them. People resist if they do not have the competencies to cope with the changes. It is natural for persons to resist if they do not have the knowledge and skills to cope with the changes. Nobody wants to be told that they are incompetent. People resist if there is a lack of incentives or benefits; If teachers are unconvinced that the new programme will make things better for students (in terms of learning) or themselves (such as greater recognition, respect or reward), they are likely to resist the suggested change.

During interview, the Dean and Heads of various departments were asked to mention some of the challenges experienced when using innovative instructional methods in teaching Public Health Programme. The mentioned challenges included inadequate instructional resources, large student populations, limited rooms and facilities, poor internet access and shortage of trained personnel. Some respondents indicated limited experience in the use of instructional methods, lack of transport to fieldwork and lack of commitment among lecturers and students.

4.6 Interventions in the Use of Innovative Instructional Methods in Implementation of Public Health Programme

The last objective of the study was to identify the needed interventions to support effective use of innovative instructional methods in the implementation of Public Health programmes. In this respect, the lecturers were first asked to give their views on

whether or not there were some interventions required to improve the use of innovative instructional methods in teaching of Public health programmes. The collected data is presented in Table 4.60.

Table 4.60: Need for Interventions to improve the use of Innovative Instructional Methods in Public Health Programme

Response	Frequency	Percentage
Yes	26	100.0
No	0	0.0
Total	**26**	**100.0**

The results in Table 4.60 shows that all, 26(100.0%), the lecturers believed that there were interventions that could be put in place to improve the use of innovative instructional methods in the implementation of the Public Health Programme. From this response, it is clear that all lecturers are aware of the needed interventions to improve the use of innovative instructional in teaching. Whenever there are challenges in carrying out a certain activity, in this case the implementation of innovative instructional methods in Public Health Programme, ways and means have to be sought to address those challenges.

The lecturers were also asked to state some of the interventions they are aware. Their responses are presented in Table 4.60.

Table 4.61: Possible Interventions to support Innovative Instructional Methods in teaching Public Health Programme

Response	Frequency	Percentage
Budgeting for resources to all departments	11	42.3
Proper planning and prioritization	13	50.0

Control student admission	11	42.3
Curriculum review	11	42.3
Introduce management course	11	42.3
Timely disbursement of funds	11	42.3
Harmonizing college activities	11	42.3
Recruitment of more staff	11	42.3
Increasing transparency	12	46.2
Timely payment of fees by students	11	42.3
Reinforce policy	12	46.2
Conduct training workshops to enhance capacity building	22	84.6
Improving and maintenance of facilities	12	46.2
Employment of technocrats to use the methods	11	42.3
Review meetings on implementation	11	42.3
Use Open Distance Education Learning (ODEL)	11	42.3
Get feedback from students on preferred practical innovative methods	11	42.3
Provide tutorial rooms	11	42.3
Allocate more funds to purchase facilities	11	42.3
Involve heads of department in school resource allocation	11	42.3
Remunerate tutors according to their input	13	50.0
Clear and regular assessment	11	42.3
Purchase modern ICT equipment	11	42.3

As shown in the Table 4.61, a great majority, 22 (84.6%), of the lecturers suggested the need to conduct training workshops to enhance capacity building in instructional technology as an intervention to improve the use of innovative instructional methods. These findings are in line with the work of Kafu (1976) and Fullan (1991) who demonstrated that sustained interaction and staff development are crucial in implementation of a programme. There needs to be training during, not just prior to implementation (Fullan *et al*., 1975). Ongoing professional development and training

is crucial for helping teachers implement strategies that need new skills in teaching or assessment.

This ongoing professional development helps provide those with capacity to implement and support the efforts of education reform. This can be addressed through teacher training workshops. Examples of successful implementation tell us that, in addition to the necessity of support for teachers during initial implementation, there is need for continuous interaction with peers and consultants during the process of implementation. Those individuals and groups who are to implement the innovation need to be involved in meaningful decision-making about the innovation plan (Fullan, 1993).

Two interventions were each identified by half, 13(50 %) of the lecturer – respondents namely proper planning and prioritization and remuneration of tutors according to their input. People resist if there is a lack of incentives or benefits; if teachers are unconvinced that the new programme will make things better for students (in terms of learning) or themselves (such as greater recognition, respect or reward), they are likely to resist the suggested change. Therefore if the lecturers can be well remunerated, as per their input regarding the use of innovative instructional methods, they can support the implementation of the programme hence overcoming the challenge of resistance.

A total of 12(46.2%) of the lecturers, in each case, suggested the following interventions, namely: Increasing transparency; improving and maintenance of facilities, and follow-up on policy implementation/reinforce policy implementation. reinforce policy; Policy refers to a rule or plan of action, especially an official one adopted and followed by a group or an organization. In this context, it is the standards or rules that all members of the school (School of Public Health) must follow. Policy guiding the implementation of innovative instructional methods in Public Health Programme should be strictly adhered to by all the stakeholders in the school of Public Health. Whenever there is laxity, then there is need by the administrators to reinforce its implementation. This can also be done through regular review meetings.

The rest of the suggested interventions, each of which was mentioned by 11(42.3%), were: curriculum review; introduction of management course; timely disbursement of funds; timely payment of fees by students; budgeting for resources in all departments and involving heads of department in school resource allocation; control of student

admissions; recruitment of more staff; harmonization of the college activities; use of Open Distance Learning (ODEL); purchase modern Information Communication Technology (ICT) equipment; get feedback from students on preferred practical innovative methods; clear and regular assessment; proper resource allocation and allocation of more funds to purchase facilities;

Curriculum review: A curriculum is a collection of lessons, assessments and other academic content taught in a school or in a specific course or program. It refers to a comprehensive multitude of learning experiences provided by school to its students. Curriculum implementation, therefore, refers to how the planned or officially designed course of study is translated by the teacher into syllabuses, schemes of work and lesson plans. Curriculum implementation must be done the way it was designed to be done. That is, with fidelity; in a consistent manner; and with challenges to students to facilitate the development and use of higher level thinking abilities. Content and skills should be taught and assessed through research-based curricula. The initial curriculum should not be permanent but should be reviewed from time to time to bring in new academic content and address the learners' expectations in line with changes in education and changes in society at large.

Introduction of management course: A management course prepares one for leadership. This intervention was proposed by the lecturer respondents bearing in mind that apart from their teaching role, they also have a management responsibility. They have to manage the students, support staff and more so the financial, physical and time resource to be utilized in the implementation of innovative instructional methods in Public Health Programme. Therefore the introduction of management course as an intervention is quite handy to equip the lecturers and administrators with management skills, presentation skills, team building skills, problem solving skills and more importantly financial management skills.

Timely disbursement of funds: This intervention will address the challenge of delayed acquisition of instructional materials needed in the implementation of innovative instructional methods in Public Health Programme.

Timely payment of fees by students as an intervention will allow the school to budget and make purchases of the teaching and learning resource materials on time.

Budgeting for resources in all departments and involving heads of department in school resource allocation: This will take care of all departmental needs as identified by the Heads of Departments to facilitate implementation of innovative instructional methods in Public Health Programme.

Provide tutorial rooms: One of the innovative instructional methods is Small Group Tutorial. Students need to be in small groups in various independent rooms during lesson time to be to be guided by the facilitator. This calls for provision of tutorial rooms.

Harmonization of college activities: When this is done, the challenge of clashing venues and timetables will be sorted out. This will allow for proper implementation of innovative instructional methods in Public Health Programme.

ODEL: Open Distance Education Learning is one of the innovative instructional methods that are applied through use of modern Information Communication Technology (ICT). This intervention when adopted can address challenges of more student population versus less teaching staff. Students, more so, mature entry students who may be working but wish to study can be encouraged to enroll in ODEL.

Purchase modern ICT equipment: From the literature review, ICT has been used often as a tool to support innovative teaching (McPherson *et. al.*, 2004). The potential for Information and Communication Technology (ICT) to automate aspects of learning and teaching is widely acknowledged, although promised productivity benefits have been slow to appear (Conole, 2004; Conole *et. al.*, 2004). The availability and quality of resource material and the availability of appropriate facilities have a great influence on curriculum implementation.

In specific relation to ICT, a crucial factor contributing to the promotion of the innovation is the availability of infrastructure resources: hardware, in terms of the number of computers in the school available for students and teachers for educational purposes, and the quality and functioning of equipment (speed of processors, OS-operating systems, peripherals and access to the Internet); as well as available software, general and educational (Venezky *et al*., 2001). However, availability of ICT alone is insufficient and must be accompanied by technical as well as pedagogical support

(Pelgrum *et al.*, 1999). Employment of technocrats to use the methods was also one of the interventions mentioned by the lecturers.

Feedback from students on preferred practical innovative methods: Student expectations are neglected, yet crucial aspect in relation to the success of some innovations (Fulan, 1991). The learner factor influences teachers in their selection of learning experiences. Given that the learner is the central figure in the curriculum implementation process, feedback from students on preferred practical innovative methods is very key as an intervention to support this process.

Clear and regular assessment: Assessment in the form of examinations influences curriculum implementation tremendously. Student assessment results from both formative and summative assessments should be analyzed regularly in order to evaluate whether individual assessments are performing reliably and validly and also whether minimum set standards are being achieved. The assessment results inform both learners, the facilitators and the administrators whether the innovative instructional methods used in the implementation of the Public Health Programme are adoptable or not.

Proper resource allocation: No meaningful teaching and learning takes place without adequate resource materials. Other studies indicate that "resource outlay or initial investment can often be used to predict implementation of an instructional method'' Kafu, 1976 and Fullan *et al*., 1975. The availability and quality of resource material and the availability of appropriate facilities have a great influence on curriculum implementation. Resource availability over both the long term and short term basis are important to the effective implementation of an instructional method, in this case implementation of innovative instructional method in Public Health Programme.

Allocate more funds to purchase facilities: Adequate finance is another very important resource needed to facilitate implementation of the instructional method. The programme will require adequate funding to sustain its activities.

Control of student admissions: This intervention though mentioned by 42.3% of the lecturer respondents, may not be a big concern, according to the researcher. Although implementation of innovative instructional methods calls for small student population, the school of Public Health already has a small student population as shown by the

figures in this study. In fact there is need to increase student population for the school to expand as long as more staff are recruited.

Table 4.62: Statistical analysis of identified possible interventions in implementation of Innovative Instructional Methods in Public Health Programme

Model	Coefficients				
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	2.111	.731		2.890	.009
Financial Intervention	.778	1.060	.343	.734	.472
Personnel Interventions	1.000	1.422	.450	.703	.490
Infrastructural Intervention	-015	1.232	.000	.000	1.000
Knowledge Intervention	-1.667	.768	-.769	-2.170	.042
Policy Based Intervention	-015	1.422	.000	.000	1.000

Multivariate linear regression analysis was done to predict the relationship between interventions faced in the use of innovative instructional methods and the various departments. There was a statistical significance on Knowledge Intervention of p value 0.042 at $p \leq 0.05$ and the dependent variable. The other variables were not statistically significant. However looking at the beta coefficients, results show personnel interventions as the strongest independent variable with 0.450 followed by financial interventions at 0.343.

4.7 Interventions in use of Innovative Instructional Methods

Student - respondents were asked to indicate whether there are interventions to be put in place in use of Innovative Instructional Methods. Table 4.63 shows the responses to this item.

Table 4.63: Whether there are Interventions that can be put in Place

Response	**2nd Yr**	**3rd Yr**	**4th Yr**	**%**
Yes	24	32	26	80
No	8	6	7	20

Out of the total number of student respondents (103), 82 of them (80%) indicated there are interventions that can be put in place to improve implementation of innovative instructional methods while 20% of the respondents indicated there were no interventions. Therefore there are interventions that can be put in place to improve implementation of innovative instructional methods in the School of Public Health.

The students were asked to suggest possible interventions that could be put in place to improve implementation of innovative instructional methods. Their responses are listed in Table 4.64.

Table 4.64: Possible Interventions that can be used to Improve Implementation of Innovative Instructional Methods

Possible intervention	2nd Yr	3rd Yr	4th Yr	%
Establish more learning rooms	15	16	16	46
Training of lecturers, human resource persons and lab assistants on the use of innovative methods	17	19	18	52
Improving the learning conditions	16	18	17	50
Review implementation of instructional methods used	17	21	19	55
Revision of the public health course	16	18	21	53
Proper time management	19	19	20	56
Introduce more electives in learning	15	16	19	49
Proper induction of first-year students	21	17	18	54
Emphasize policy implementation on the methods	16	18	19	51
Motivate students to embrace innovative methods	16	17	16	48
Enough resource allocation to support effective implementation of innovative methods	17	17	17	50
Engage students in discussion rather than overly using lectures	17	18	16	50
Exchange programmes (bench-marking)	15	17	17	48
Set up programmes to reinforce application of the innovative methods	16	16	18	49
Provide enough books for every course	15	20	16	50
Provide full-time access to the internet and Wi-Fi	20	19	21	58
Provide more human personnel (facilitators) for common courses	16	17	15	47
The university should set aside specific teaching rooms for students of different years	13	16	15	43
Increase practical sessions	15	18	17	49
Introduce e-learning	17	18	21	54

The student - respondents gave several suggestions of interventions that can be put in place to improve innovative instructional methods as shown in table 4.64. Notable among the interventions was provision of full time access to the internet and WI- FI (58%); proper time management (56%); review of implementation of innovative instructional methods used (55%); proper induction of first year students (54%); proper induction of first year students (54%); introduce e-learning (54%); revision of the public health course (53%); training of lecturers, human resource persons and

laboratory assistants on the use of innovative instructional methods (52%); emphasize policy implementation on the methods (51%); improve the learning conditions(50%); engage students in discussions rather than overly using lectures (50%); enough resource allocation to support effective implementation of innovative instructional methods (50%) and provide enough books for every course (50%); Other suggested interventions were: introduce more electives in learning (49%); set up programmes to reinforce application of the innovative instructional methods (49%); increase practical sessions (49%); exchange programmes / benchmarking (48%); motivate students to embrace innovative instructional methods (48%); provide more human personnel /facilitators for common courses (47%); establish more learning rooms (46%) and the university to set aside specific teaching rooms for students of different years (43%).

Provision of full time access to the internet and Wireless Fidelity (WI- FI): Internet and Wireless Fidelity access enables students to carry out research and get the much needed information easily and quickly. Provision of internet and Wireless Fidelity services within the school would allow students to do their work together from the school premises. This then would promote other innovative instructional methods like Small group discussion and e – learning. Team work among the students will also be greatly enhanced.

Proper time management: It is interesting to note that many students (56%) indicated the need for proper time management as an intervention to be used to improve implementation of innovative instructional methods. If students can manage their own time well for example by being punctual and settling down for the lessons in time, this can greatly improve implementation of some of the innovative instructional methods like Small Group Tutorial which calls for a lot of time from the facilitator to be able to attend to various small groups within a given time.

Review of implementation of innovative instructional methods used: There are several innovative instructional methods as discussed in the literature review. Each of the methods has advantages and disadvantages. The methods are applied differently to different learning situations. These methods therefore need to br regularly reviewed to suit the changing learning environments. Review of implementation of the methods would address changes in technology, education and the society at large.

Proper induction of first year students: This intervention was suggested by the second, third and fourth year students who were first years previously. This could be an indicator of a gap that needs to be filled. First year students do not have background knowledge about innovative instructional methods, yet these are the methods to be used in their instruction for the four year study period. It would be prudent therefore for them to be properly inducted and allowed time to understand these innovative instructional methods. The administration in the School of Public Health needs to liase with Medical Education experts on this issue. Proper induction of firs year students would form a firm foundation for implementation of innovative instructional methods in Public Health Programme.

Introduce e-learning: E-learning (electronic-learning / online-learning): This refers to a learning system that can be obtained through the internet using an electronic device. Electronic-learning platforms include: Massive Online Open Courses (MOOCs), Virtual Learning Environment such as learn or blackboard (VLE), Video streaming services such as YouTube, Virtual instructor - led training (VILT) e.g. WebEx, Webinars, Forums, Podcasts and Discussion. E-learning as an innovative instructional method will be of a big advantage to the students and even the facilitators as it is cost effective and saves time.

Revision of the public health course: The initial curriculum of the Public Health course that was adopted when the School of Public Health, Moi University was started in 1998 may require revision. This is in line with the rapid societal changes and educational changes coupled with technological changes. Revision of the Public Health Course as an intervention would make it more relevant and applicable to the current world public health problems.

Training of lecturers, human resource persons and laboratory assistants on the use of innovative instructional methods: Research on implementation has demonstrated that sustained interaction and staff development are crucial (Fullan, 1991). There needs to be training during, not just prior to implementation (Fullan *et al.*, 1975). Continuous training is extremely important for effective implementation after adoption. Ongoing professional development can be addressed through teacher training workshops.

Emphasize policy implementation on the methods: Policy refers to a rule or plan of action, especially an official one adopted and followed by a group or an organization. In this context, it is the standards or rules that all members of the school (School of Public Health) must follow. This intervention having been suggested by the students may point to what they could have observed among the facilitators and students themselves in the course of the implementation. It could be that the innovative instructional methods are not fully embraced as expected by the school policy. Policy guiding the implementation of innovative instructional methods in Public Health Programme should therefore be strictly adhered to by all the stakeholders in the school of Public Health. Whenever there is laxity, then there is need by the administrators to reinforce its implementation. This can also be done through regular review meetings.

Improve the learning conditions: A conducive learning atmosphere enhances the learning process. Such conditions include both the physical environment and social environment. This intervention can be anchored on the constructivist view of learning reflected in the developmental theories of Bruner (Bruner, 1961), Dewey (Dewey, 1997), Piaget (Piaget1972) and Vygotsky (Vygotsky, 1978) among others. In *cognitive constructivism*, which originated primarily in the work of Piaget, an individual's reactions to experiences lead to (or fail to lead to) learning. In *social constructivism*, whose principal proponent is Vygotsky, language and interactions with others (family, peers, and teachers) play a primary role in the construction of meaning from experience. Meaning is not simply constructed, it is co-constructed (Biggs, 1996).

Engage students in discussions rather than overly using lectures: Small group discussion is an appropriate technique for encouraging students to analyze synthesis and evaluate the knowledge that they acquire (higher order cognitive skills). Singh, Bharat (1995) compared the effectiveness of discussion method and traditional method at B.ED level and result showed that discussion method was more effective. Students would prefer discussion innovative instructional method as it provides them with opportunities to interact with the instructor and fellow students; it allows students to become active participants in the learning process rather than passive recipients of information from one source. Work becomes more interesting and there is greater motivation to learn. The students would help each other with difficult points.

Provide enough books for every course: the government or Ministry of Education should supply schools with adequate resource materials such as text - books and stationery in order to enable teachers and learners to play their role satisfactorily in the curriculum implementation process. Introduce more electives in learning: Elective is a method of teaching which allows students to identify areas of learning which are of interest to them and then supporting them to realize set goals. The students would have put fourth this intervention bearing in mind that "It is no longer possible for students to study in depth all topics in the curriculum" (Ballimore, 1998). This is an enrichment option in learning. Harden *et al.* (1984), argue that the most important out - come of an elective is often the change of the student's attitudes towards their studies and professional practice. Set up programmes to reinforce application of the innovative instructional methods: Such programmes would include academic shows for students to display various areas of study using innovative instructional methods, seminars, workshops, essay competitions with topics on innovative instructional methods among others. Enough resource allocation to support effective implementation of innovative instructional methods: The availability and quality of resource material and the availability of appropriate facilities have a great influence on curriculum implementation. Increase practical sessions: More practical sessions for the students would mean more adoption of innovative instructional methods which are practical in their nature. Examples of such methods that can be used are Problem Based Learning, Community-Based Education and Service and e-learning that would practically require use of Information Communication Technology.

Exchange programmes / benchmarking: These are programmes where students, staff and other stakeholders visit a learning institution of the same status that offers Public Health Programme, with similar instructional methods, in this case innovative instructional methods. The main objective of the visit is comparison on how the implementation is carried out and learning new ideas on the same. This intervention suggested by the students can help improve implementation of innovative instructional methods in Public Health Programme.

Motivate students to embrace innovative instructional methods: The centrality of the learner is one of the key features in implementation of an innovative instructional method. Teachers should blend education and change, periodically discuss the meaning

of activities with students, work on the skills students need to participate in new educational reforms and consider the relationship between old and new (Fullan, 1991). Motivation both intrinsic and extrinsic can go a long way in developing a positive attitude among learners towards innovative instructional methods in implementation of Public Health Programme. Provide more human personnel / facilitators for common courses: Human resource including teachers, technical and administrative and support staff form another important support needed for implementation. There should be sufficient staff to deliver and support the delivery and assessment of the curriculum. Establish more learning rooms: The appropriate authority must also provide physical facilities such as classrooms, laboratories, workshops, libraries and sports fields in order to create a conducive environment in which implementation can take place.

The university to set aside specific teaching rooms for students of different years: there should be adequate provision of teaching rooms and office space to accommodate learners at all stages of the program as well as social and study space for students to spend time outside the classroom. There should also be sufficient space for teachers to prepare teaching and meet with students. Many researchers claim that without major change in the school structure (allocation of classes and teaching units) and in the learning processes (teaching and assessment methods) no significant change in educational process can occur (Sizer, 1993; Tyack *et. al.,* 1995).

Table 4.65: Statistical Analysis of the Relationship between Interventions and the Year of Study of Students

Model	Coefficients			T	Sig.
	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta		
(Constant)	3.078	.258		11.918	.000
Personnel Based	.139	.691	.087	.201	.841
Infrastructure	.611	1.020	.385	.599	.551
Knowledge	-1.028	.814	-.647	-1.263	.210
Financial	.583	.628	.367	.928	.356
Policy	-.355	.480	-.222	-.739	.461

Multivariate linear regression analysis was done to predict the relationship between interventions proposed in the use of innovative instructional methods and the year of study. There was no statistical significance between the dependent and the independent

variables, however looking at the beta coefficients shows infrastructure interventions as the strongest independent variable with 0.385 followed by financial interventions at 0.367.

Further to this, the students were asked to give reasons for the suggested interventions. The reasons given are summarized in Table 4.66.

Table 4.66: Students' Reasons for putting interventions in place

Reasons for the suggested interventions	**2nd Yr**	**3rd Yr**	**4th Yr**	**%**
To ensure the achievement of the desired goals and objectives of the public health programme	17	18	21	54
To improve delivery of content using innovative methods	16	17	16	48
To correct or address challenges in implementation	19	18	21	56
To improve the use of innovative methods	16	18	16	49
To suggest steps to make corrections	16	17	19	50
To help improve the effectiveness of innovative instructional methods in teaching and learning of public health programme	15	16	16	46
Exchange programmes will help acquaint students with innovations in other institutions to enable them to emulate	16	17	19	50
Improve internet connection to ease research and access to useful information	15	18	19	50
To ensure there is safety in application of innovative methods	16	16	17	48
To reduce the time wasted by class representatives looking for unoccupied rooms to conduct classes	21	19	18	56
To make the learning process easy	14	19	17	49
To improve students' efficiency in their careers afterwards	13	16	19	47
To promote easy understanding of subject content	18	16	17	50
To promote hands on mastery of skills	17	16	18	50

From Table 4.66, there are several reasons for putting interventions in place which can be grouped under those aimed at achievement of goals and objectives of Public Health Programme; To ensure the achievement of the desired goals and objectives of the Public Health Programme; to improve delivery of content using innovative methods; to make learning process easy; to promote easy understanding of subject content; to promote hands on mastery of skills.

Those geared towards correcting existing inefficiencies; to correct or address challenges in implementation; to improve the use of methods; to suggest steps to make corrections; to help improve the effectiveness of innovative instructional methods in teaching and learning of Public Health Programme; exchange programmes to help acquaint students with innovations in other institutions to enable them emulate; to reduce the time wasted by class representatives looking for unoccupied rooms to conduct classes; to improve students' efficiency in their careers afterwards.

Those aimed at improving facilities; to improve internet connection to ease research and access to useful information.

Those geared towards ensuring safety in application of the methods; to ensure there is safety in application of innovative instructional methods.

All the reasons given point at improving the innovative instructional methods and enhancing the overall implementation of the Public Health Programme.

Lecturers were further asked to explain why the specific interventions they suggested were the most appropriate. Their responses were as summarized in Table 4.67.

Table 4.67: Lecturers' Reasons for putting in Place Interventions for Implementation of Innovative Instructional Methods

Response	Frequency	Percentage
To address shortcomings faced in using innovative methods	13	50.0
To improve innovative instructional methods	18	69.2
For modernization purpose	11	42.3
ODEL can cater for large numbers of students	11	42.3
To improve skills of learners or graduates	11	42.3
To expose tutors on the methods	11	42.3
To improve implementation of innovative methods	13	50.0

The main explanation given by the majority, 18(69.2%), of the lecturers for the need of the suggested interventions was to promote quality and use of innovative instructional methods in Public Health Programme. Half, 13(50.0%), of the lecturers, in each case, said the interventions they suggested would help address shortcomings faced in using innovative methods and improve implementation of innovative instructional methods..

The rest of the lecturers, 11(42.3%) in each case, gave the following explanations for the interventions they had proposed. For modernization of the Public Health Programme; in the case of Open Distance Education Learning (ODEL), to manage large numbers of students; to promote the competence of learners or graduates and to expose tutors to the new innovative instructional methods. These interventions if put in place probably could help address challenges facing the implementation of innovative instructional methods and promote the use of these methods in instruction of Public Health Programme.

The student respondents were also asked to say how the interventions were to be adopted. This was aimed at informing the research how the interventions were to be realized in order to contribute towards improving Innovative Instructional Methods. The responses given are shown in Table 4.68.

Table 4.68: Students' Responses on Adoption of Interventions

Strategy	**2nd Yr**	**3rd Yr**	**4th Yr**	**%**
Through e-learning	**16**	**17**	**19**	**50**
Implementation of benchmarking reports	**15**	**18**	**16**	**48**
Abiding by the set regulations and standards	**16**	**17**	**19**	**50**
Step-by-step across every academic year	**21**	**17**	**19**	**55**
Regular review of the public health course	**19**	**18**	**21**	**56**
Collaborative stakeholder (lecturers and students) involvement	**15**	**16**	**19**	**49**
Train the lecturers to use the new methods before training students	**15**	**16**	**17**	**47**
The head of the Faculty of Public Health and other schools should hold regular meetings to discuss the issues affecting the implementation of innovative methods	**17**	**21**	**18**	**54**

From Table 4.68, notable among the adoption strategies was regular review of the public health course to address upcoming issues. The second one was step by step adoption across all the academic years. This would allow for specific methods for specific classes depending on the courses offered at that particular time of the academic year. The third was that the head of faculty of Public Health and other schools to hold regular meetings to discuss issues affecting the of innovative methods; Most respondents were of the opinion that regular review meetings can actually identify

the challenges faced by all stakeholders in the programme. Through regular review meetings, simple challenges identified would be addressed before developing into complex issues to be handled.

E - Learning. This strategy requires the use of support educational technologies like the laptops which in turn need accessibility to the internet and power source. Accessibility could be limited to some few rooms where the students take the lessons. Limited access to e - learning may only allow use among a few facilitators and students. Therefore, adopting this kind of strategy will disadvantage those who cannot access internet services. There is need for capacity - building in development of human resource and other relevant facilities.

Lastly, the lecturer - respondents were asked to explain how these interventions should be implemented. Their responses to this item were as indicated in Table 4.69.

Table 4.69: Lecturers' responses on Adoption of the interventions in implementation of Public Health Programme

Response	Frequency	Percentage
Through university policy	15	57.7
Consultative meetings	11	42.3
At the start of every semester/new academic year	12	46.2
Reinforce implementation	11	42.3
Avail experts	11	42.3
Involve all stake holders	11	42.3
In phases across the academic levels	11	42.3
During recruitment of lecturers/induction of new lecturers	13	50.0
During intake stage of students	11	42.3

As shown in Table 4.69, majority, 15(57.7%), of the lecturers said that the interventions should be made part of the university policy for easy implementation. This would be adopted by all the stakeholders in the school. Half, 13(50.0%), of the lecturers said the interventions should be adopted during recruitment of lecturers or through induction programmes for new lecturers. New members of staff will need to learn the methods to be used in their instruction of students. Twelve (46.2%) of them said the interventions should be implemented at the start of every semester or new academic year. This would

take care of specific courses offered at that particular time of the academic calendar. The rest of the lecturers, 11(42.3%) in each case, suggested the following strategies for adoption of the proposed interventions: use of consultative meetings; reinforcement of the implementation of innovative instructional methods; availing experts; involving all stake - holders that is, facilitators, learners and administrators involved in use of Public Health Programme; implement the interventions gradually across the academic levels and during in - take stage of students.

The proposed adoption modes of interventions are drawn from the discussed challenges and the causes of those challenges in the use of innovative instructional methods. All the interventions if systematically adopted can positively influence the use of these methods in the implementation of the Public health programme.

As regards the possible interventions to support Innovative Instructional Methods, a great majority of the respondents that is, Heads of Departments suggested the need to conduct training workshops to enhance capacity building as an intervention to improve the use of innovative instructional methods. Two interventions, namely proper planning and remuneration of tutors according to their input, were each identified by some of the respondents. Others suggested the following interventions, namely: Increasing transparency; improving and maintenance of facilities, and follow-up on policy implementation/reinforce policy implementation.

The other suggested strategies included budgeting for resources to all departments; control student admissions; curriculum review; introduce management course; timely disbursement of funds; harmonizing college activities; recruitment of more staff; timely payment of fees by students; reinforce policy; employment of technocrats to use the methods; review meetings on implementation; use Open Distance Education Learning (ODEL); get feedback from students on preferred practical innovative methods; provide tutorial rooms; allocate more funds to purchase facilities; involve heads of department in school resource allocation; clear and regular assessment, and purchase modern Information Communication Technology (ICT) equipment.

On the interviewees' role on implementation of innovative instructional methods, the interviewees mentioned administration and supervision as their main roles.

4.8: Summary

This chapter has presented the results of the research, interpretations and discussion of the study. The results from the lecturer respondents and those from the student respondents were presented concurrently. Similarly, results drawn from the interview schedule and observation checklist were incorporated in the presentation. The first data showed the demographic characteristics of the respondents. This was followed by an analysis of the results based on the objectives of the study. The next chapter will present the conclusions and recommendations of the study.

CHAPTER FIVE
CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the conclusions and recommendations of the research findings. The value of this chapter is to highlight the most important findings and give recommendations based on the study. The chapter will first state the conclusions, then the recommendations. The conclusions and recommendations are as per the research findings.

5.2 Conclusions from Findings

The conclusions are outlined based on the objectives as follows;

5.2.1 Level of Knowledge on Innovative Instructional Methods

The analysis of the collected data demonstrates that all the lecturer respondents, 26(100%) were familiar with innovative instructional methods: Besides, all the lecturer respondents, 26(100%) well described innovative instructional methods as being modern as opposed to being traditional. Further, all of them 26(100%) also said innovative instructional methods were learner - centered as opposed to being facilitator - centred. In addition, the majority of the lecturer respondents 18(69.2%) believed that innovative instructional methods were most applicable with small student populations than the conventional large classes. Lastly, most of the lecturer respondents 16(61.5%) indicated that innovative instructional methods required the facilitator to withdraw at some point during the learning process to allow students to learn on their own.

5.2.2 Application of Innovative Instructional Methods in Implementation of Public Health Programme

On the use of innovative methods in implementation of Public Health Programme**,** most of the lecturers indicated that Problem Based Learning (PBL) 21(80%), Community Based Education and Service (COBES) 20 (76.9%), Small Groups Discussion (SGDs) 19 (73.1%), Small Group Tutorial (SGTs) 14 (53.8%), Electives 14 (53.8%) and Self Directed Learning (SDL) 13(50%) were most used. On their part, most of the students identified Small Group Discussions (SGDs) 94 (91-3%), Problem Based Learning (PBL) 94(91.3%), Small Group Tutorials (SGTs) 90 (87.4%), Self Directed Learning (SDL) 92 (89.3%) and Community Based Education and Service (COBES) 88 (85-4%) as the most used.

Majority of the lecturer respondents 22(84.6%) indicated there were some innovative methods used in evaluation of public health programme while some 4(15-4%) said they did not have such knowledge. Some of the methods said to be used in evaluation by the lecturers included: report writing 16(61-5%), project documentation 16(61-5%) multiple choice questions (MCQs) 13(50%), field assessments 13(50%), peer assessments 12(46.2%), short-answer questions (SAQs) 12(46.2%), Objective Structured Practical Examination (OSCPE) 12(46-2%), long-essay questions (LEQs) 12(46.2%), laboratory reports 12(46.2%), group and individual presentations 11(42.3%), practical examinations 11 (42-3%), lecturers' self-assessment 11(42.3) and student-tutor assessments 11(42.3%).

5.2.3 Factors that Determine the Use of Innovative Instructional Methods in Implementation of Public Health Programme

The following factors came out as statistically significant (P-value indicated) after linear regression was done: High student to lecturer ratio (0.000), lack of transport (0.000), school policy (0.003), availability of facilities (0.003), cost of materials (0.003), lack of commitment (0.003), complexity of methods (0.021), different types of learners (0.021), course requirements(0.021), time factor (0.021). High student to lecturer ratio (0.000) and lack of transport (0.000) were the most significant factors that determined the use of instructional methods in implementation of Public Health Programme.

5.2.4 Challenges in the Use of Innovative Instructional Methods in Implementation of Public Health Programme

All of the respondents, that is, lecturers, students, Dean and Heads of Departments affirmed that there were challenges experienced in the use of innovative instructional methods. The most serious challenges with a response rate of above 50% were: Inadequate physical facilities (52%), poor internet service (52%), large classes (50%); lack of research centre (50%); limited funding (50%), Unfamiliar methods to students (50%), Inadequate modern equipment (50%), lack of funding for field work (50%), lecturers' lateness to class (50%), cost issues (50%).

5.2.5 Interventions in the Use of Innovative Instructional Methods

From the analysis of the collected data , all of the respondents believed that there were interventions that could be put in place to improve the use of innovative instructional methods in the implementation of the Public Health Programme. The

following were identified as the main interventions with response rate above 50% that could be put in place to support effective use of innovative instructional methods in the implementation of Public Health Programme: conduct training workshops to enhance capacity – building(84.6%) ; follow-up on policy implementation (51%); allocate more funds to purchase facilities (50%)) Improve learning conditions(50%), review implementation of instructional methods used (55%),revision of Public Health course (53%), proper time management (56%), proper induction of first year students (54%),engage students in discussions (50%), provide enough books for every course (50%),provide full time access to the internet and WI-FI (58%) and introduce e-learning (54%).

The main reason as to why the interventions were necessary was to help address shortcomings faced in using innovative instructional methods. From the study, it was emphasized that the interventions should be implemented through university policy.

5.3 Recommendations

The main focus of medical education is to enhance quality of health care in the society by providing highly competent health care professionals. Quality learning depends on quality of teaching that will be influenced by the type of instructional methods used in implementation of the education programme. To ensure that innovative instructional methods are used in implementation of the public health programme, this study recommends the following;

That both the facilitators and students embrace Innovative Instructional Methods they are aware of. Innovative methods to be fully used in implementation of public health curriculum. The Public Health Programme to intergrate both traditional methods and innovative methods in evaluating their students.

That the School of Public Health to address the main factors like funding that hinder use of innovative instructional methods in implementation of public health programme.

That the stakeholders (Administrators and lecturers) to embrace the interventions suggested from the study in order to improve the use of innovative instructional methods and quality of their graduands.

5.4 Suggestions for Further Research

This study focused on implementation of innovative instructional methods in Public Health Programme and interventions in Moi University. Further research ought to be carried out to establish challenges in the application of innovative skills among Moi University Public Health graduands in their work places.

5.5 Summary

This chapter has presented the conclusions and recommendations of the research findings. Chapter one discussed the background of the study. Chapter two discussed the general and other literature related to the study. Chapter three explained the methodology that was adopted for conducting the study. Chapter four discussed the results, their interpretation and discussion while chapter five highlighted the conclusions and recommendations of the study.

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APPENDICES

APPENDIX 1: STUDY INFORMATION SHEET (CONSENT)

Appendix 1: Study information sheet and consent form

Part 1: Study Information Sheet

Dear Participant,

Study Title: Determinants of Implementation of Innovative Instructional methods in Public Health Programme and possible interventions in Moi University.

Part 2: Consent of Participant

I have read or have had read to me the description of the research study from the information sheet. The researcher has explained the study to me and answered all the questions I asked. I have been told of the possible benefits (if any) and been informed of the confidentiality of the study. I freely volunteer to take part in this study.

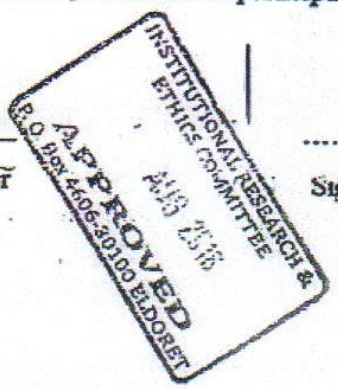
....

Signature of Participant Date

I have explained this study to the above participant and have sought his/ her understanding for informed consent.

Mary N. Wanyonyi

Name of researcher



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Signature of researcher Date

APPENDIX 2: QUESTIONNAIRE FOR LECTURERS

Date: .....

Please tick [√] **in the appropriate box**

Part (I): Demographic Data

1. Sex of respondent: 1. Male ☐ 2. Female ☐

2. Age of respondent: 1. 25 - 31 ☐ 2. 32 - 38 ☐
3. 39- 45 ☐ 4. 46 - 52 ☐ 5. 53-59 ☐
6. 60- 66 ☐ 7. 67 - 73 ☐ 8.Above 73 ☐

3. School .....

4. Department of affiliation .....

5. Position in department .....

5. Level of qualification.....

6. Teaching experience .....

Part 2: Level of Knowledge on Innovative Instructional Methods

7. The following are innovative instructional methods. Please tick √ against the methods that you are familiar with.

Innovative Instructional Method	
Small Group Tutorial (SGT)	
Small Group Discussion (SGDS)	
Problem – Based Learning (PBL)	
Community – Based Education and Service (COBES)	
Computer Assisted Instruction (CAI)	
Computer Assisted Assessment (CAA)	
E- Learning	
Self –Directed Learning (SDL)	
Independent Study (IS)	
Electives	

8. Please list other instructional methods that you know.

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Please tick √ against one of the responses below that you agree with.

9. Innovative instructional methods are

a) Traditional methods ☐

b) Modern methods. ☐

10. Innovative instructional methods are

a) Learner centered. ☐

b) Facilitator centred. ☐

11. Innnovative instructional methods are applicable where there is

a) Large student population ☐

b) Small student population. ☐

12. Innovative instructional methods require the facilitator to withdraw from the learning scene at some point to allow students learn on their own.

Yes ☐ No ☐

13. Which innovative instructional method allows students to identify areas of learning which are of interest to them?

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Part 3: Application of Innovative instructional Methods in implementation of Public Health Programme.

14. Do you think Innovative Instructional Methods are used in implementation of Public Health Programme?

Yes ☐ No ☐

15. If Yes, please list some of the Innovative Instructional Methods used in teaching of Public Health Programme.

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16. Which one among the methods is the most used innovative instructional method in Public Health Programme ?

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17. Please list other instructional methods used in teaching of Public Health Programme.

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18. To what extent are Innovative Instructional Methods used in teaching of Public Health Programme?

Not at all ☐
Least extent ☐
Some extent ☐
Great extent ☐

19. Why do you think so?

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20. Are media resources used in Innovative Instructional Methods in teaching of Public Health Programme?

Yes ☐ No ☐

21. If yes, please list some the media resources applied in Innovative Instructional Methods in teaching of Public Health Programme.

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22. To what extent are media resources used in Innovative Instructional Methods in teaching of Public Health Programme

Not at all ☐

Least extent ☐

Some extent ☐

Great extent ☐

23. Why is it so?

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24. Do you know any Innovative Assesment Methods used in evaluation of Public Health Programme ?

Yes ☐ No ☐

25. If yes, which are some of the Innovative Assesment Methods used in evaluation of Public Health Programme ?

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26. To what extent are Innovative Assesment Methods used in evaluation of Public Health Programme?

Not at all ☐
Least extent ☐
Some extent ☐
Great extent ☐

27. Why is it so?

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28. Please list teaching skills used by facilitators in innovative instructional methods.

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Part 4: Factors that determine use of Innovative Instructional Methods in Public Health Programme.

29. Please list some of the factors you know that influence use of innovative instructional Methods in Public Health Programme by classifying them into minor and major factors.

a) Minor

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b) Major

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30. In general, in what ways do these factors affect the use of Innovative Instructional Methods in Public Health Programme?

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Part 5: Challenges in use of Innovative Instructional Methods in Implimentation of Public Health Programme.

31. Are there some challenges experienced in use of Innovative Instructional Methods in teaching of Public Health Programme?

Yes ☐ No ☐

32. If yes, please list some of the challenges faced in use of Innovative Instructional Methods in teaching of Public Health Programme?

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33. How would you rate the listed challenges beginning with the most serious one?

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34. In your own opinion, what causes these challenges?

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Part 6: Interventions in use of Innovative Instructional Methods in Implimentation of Public Health Programme.

35 . Do you think there are some interventions that can be put in place to improve the use of Innovative Instructional Methods in teaching of Public Health Programme?

Yes ☐ No ☐

36. If yes, what are some of the possible interventions that can be adopted in the use of Innovative Instructional Methods in teaching and learning of Public Health Programme?

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37. Why do you think such interventions should be put in place?

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38. In your own opinion, how should these interventions be adopted?

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Thank you for completing this questionnaire.

Kindly sms 0720443570 to collect the questionnaire or leave with the secretary at your department.

APPENDIX 3: QUESTIONNAIRE FOR STUDENTS

QUESTIONNAIRE TO STUDENTS

Date: .....

Please tick [√] in the appropriate box

Part (I): Demographic Data

1. Sex of respondent: 1. Male ☐ 2. Female ☐
2. Age of respondent: 1. 18-24 ☐ 2. 25 - 31 ☐ 3. 32 - 38 ☐ 4. 39- 45 ☐
3. School .....
4. Department of affiliation .....
5. Year of study .....

Part 2: Application of Innovative Instructional Methods in Implementation of Public Health Programme.

i. Below is a list of innovative instructional methods. Please tick √ against the methods that have been used in the teaching and learning of Public Health.

Innovative Instructional Method	
Small Group Tutorial (SGT)	
Small Group Discussion (SGDS)	
Problem – Based Learning (PBL)	
Community – Based Education and Service (COBES)	
Computer Assisted Instruction (CAI)	
Computer Assisted Assessment (CAA)	
E- Learning	
Self –Directed Learning (SDL)	
Independent Study (IS)	
Electives	

7. Please tick √ against each method below how often they are used in the teaching and learning of Public Health Programme .

Innovative Instructional Method	Not at all	Rarely	Often	Very often
Small Group Tutorial (SGT)				
Small Group Discussion (SGDS)				
Problem – Based Learning (PBL)				
Community – Based Education and Service (COBES)				
Computer Assisted Instruction (CAI)				
Computer Assisted Assessment (CAA)				
E- Learning				
Self –Directed Learning (SDL)				
Independent Study (IS)				
Electives				

8. Please list other teaching/learning methods that have been used in teaching and learning of your course.

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9. Please indicate how often each other method in number 8 above are used in teaching and learning of Public Health Programme;

Not at all ☐ Rarely ☐ Often ☐ Very often ☐

10. Please tick √ against the methods that have been used in assessment of Public Health Programme.

Innovative Instructional Method	
Small Group Tutorial (SGT)	
Small Group Discussion (SGDS)	
Problem – Based Learning (PBL)	
Community – Based Education and Service (COBES)	
Computer Assisted Instruction (CAI)	
Computer Assisted Assessment (CAA)	
E- Learning	
Self –Directed Learning (SDL)	
Independent Study (IS)	
Electives	

11. Please list other methods that have been used in assessment of Public Health Programme.

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Part 3: Factors that determine use of Innovative Instructional Methods in Public Health Programme

12. Below is a list of instructional resources that may be used in teaching and learning of Public Health. You are kindly requested to tick √ in the appropriate column all the resources that are Available or Not Available, Adequate or Inadequate, Used or Not used in your programme.

Instructional Resource	Available	Not Available	Adequate	Not Adequate	Used	Not Used
Human (Lecturers)						
Teaching/ Learning rooms						
Laboratories						
Library						
Textbooks						
Human (Resource Persons)						
Overhead Projector						
Handouts						
Internet services						

13. Please list some other factors that can influence use of innovative instructional methods in implementation of Public Health Programme.

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Part 4: Challenges in use of Innovative Instructional Methods in Implementation of Public Health Programme.

14. Are there any challenges experienced in use of Innovative Instructional Methods in learning of Public Health Programme?

Yes ☐ No ☐

15. If yes, please list some of the challenges faced in use of Innovative Instructional Methods in learning of Public Health Programme?

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16. How would you rate the listed challenges beginning with the most serious one?

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17. In your own opinion, what causes these challenges?

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Part 5: Interventions in use of Innovative Instructional Methods in Implimentation of Public Health Programme.

18. Do you think there are some interventions that can be put in place to improve the use of Innovative Instructional Methods in teaching and learning of PublicHealth Programme?

Yes ☐ No ☐

19. If yes, what are some of the possible interventions that can be adopted in the use of Innovative Instructional Methods in teaching and learning of Public Health Programme?

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20. Why do you think such interventions should be put in place?

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21. In your own opinion, how should these interventions be adopted?

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Thank you for completing this questionnaire.

Kindly sms 0720443570 to collect the questionnaire or leave with the secretary at your department.

APPENDIX 4: OBSERVATION CHECKLIST

Date.....

The researcher to observe and write comments on the following components of the research study.

Part 1: Facilities

The type, nature, condition, quality, quantity and appropriateness of physical facilities in the School of Public Health.

Area/ Item

1. Physical facilities (type)

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2. Location of facilities

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3. Adequacy of facilities

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4. Condition of facilities

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5. Appropriateness of facilities

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APPENDIX 5: INTERVIEW SCHEDULE FOR DEAN AND HEADS OF DEPARTMENTS.

Researcher to explain the objectives of the research study and seek views on the following:

General Information

Designation of respondent .....

Number of years served in that position .....

Using the following 4-point scale, interviewer to tick (√) appropriately against the items listed below based on the interviewees responses:

Scale

1. Not at all
2. Least extent
3. Some extent
4. Great extent

Item	Rating scale			
	1 Not at all	2 Least extent	3 Some extent	4 Great extent
1. To what extent do you know innovative instructional methods ?				
2. To what extent do you think the students know innovative instructional methods ?				
3. To what extent do you think the academic staff know innovative instructional methods ?				

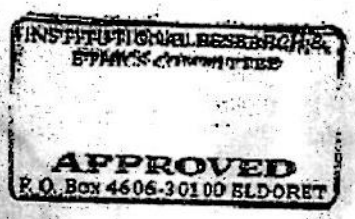
4. To what extent do you think the academic staff use innovative instructional methods in teaching of Public Health Programme?				
5. To what extent do you think use of innovative instructional methods is effective in implementation of Public Health Programme?				

1. Has there been a shift from traditional methods to innovative instructional methods in implementation of Public Health Programme.

Yes ☐ No ☐

2. Are innovative instructional methods flexible and adaptable ?

Yes ☐ No ☐



3. Are innovative instructional methods practical in Implementation of Public Health Programme ? Yes ☐ No ☐

4. What are some of the factors that influence use of Innovative Instructional Methods in Implementation of Public Health Programme?

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5. What are some of the challenges experienced in use of Innovative Instructional Methods in Implementation of Public Health Programme?

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6. Please suggest some possible interventions to address these challenges.

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7. What do you think is your role in Implementation of Innovative Instructional Methods in Public Health Programme?

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Thank you for your response.

APPENDIX 6: RESEARCH BUDGET

The research study is envisaged to utilize the following estimated budget

Proposal phase

Serial No.	**Item**	**Unit cost in Kshs.**	**Amount in Kshs.**	**Total Amount**
1.	Printing of a) 1st draft of proposal approx. 100 pages per copy b) 2nd draft of proposal (100 pages)	@ 10.00 per page @ 10.00 per	1,000 1,000	2,000
2.	Photocopying 1st draft (3 copies) Photocopying 2nd draft (5 copies)	@ 2.00 per page @ 2.00 per page	600.00 10,000.00	10,600.00
3.	Binding of accepted proposal (5 copies)	@ 150.00	750.00	750.00

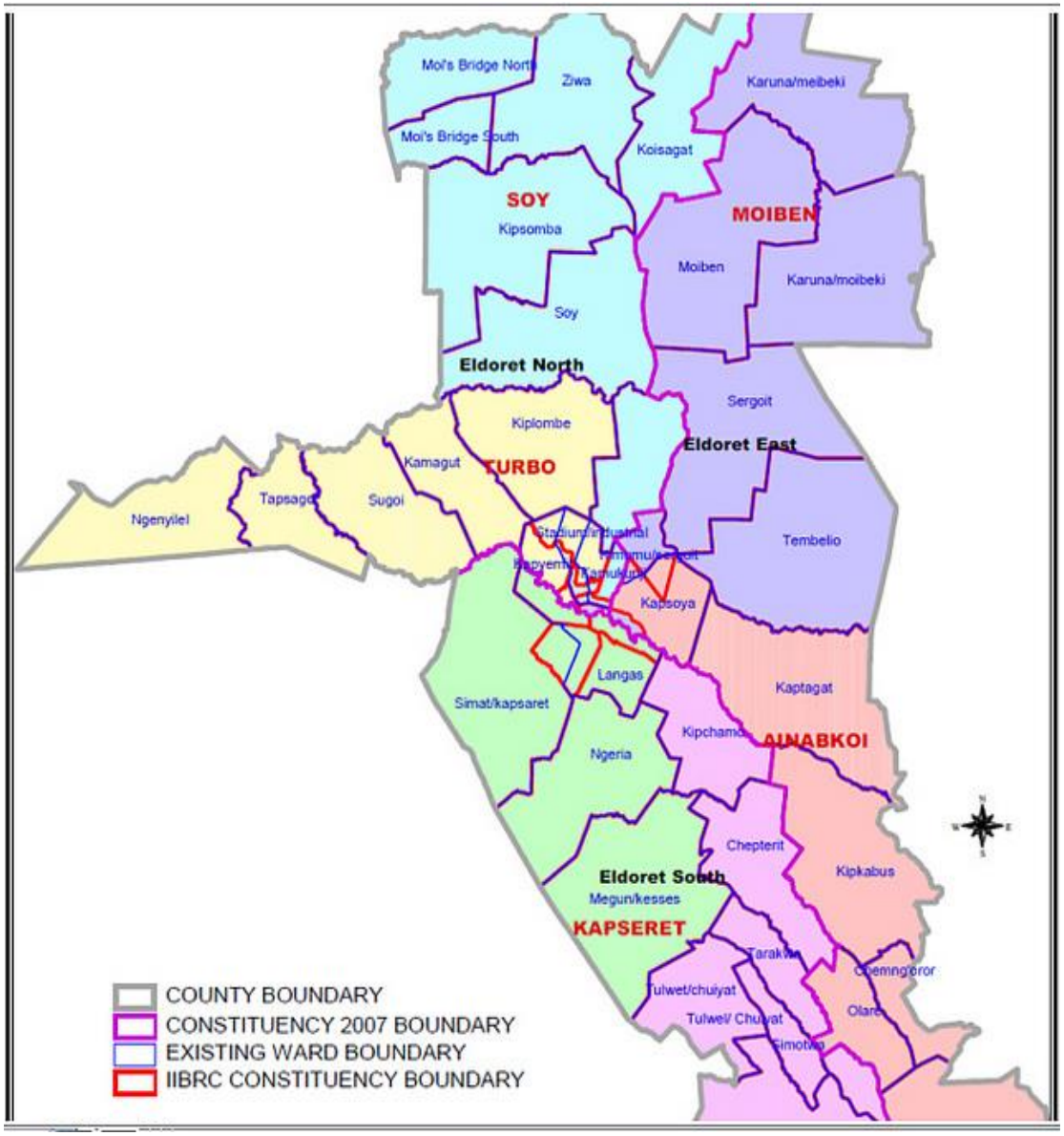
Data Analysis

a) Data coding and entry for 30 days	@ 1,000.00	30,000.00
b) data analysis using statistical		55,000.00
package for 5 days	@ 5,000.00	25,000.00

Thesis writing

1st draft printing (approximately 500 pages) 1 copy	@ 10.00 per page	5,000.00	15,000.00
2nd draft 1 copy	@ 10.00 per page	5,000.00	
3rd draft and final copy	@ 10.00 per page	5,000.00	
Photocopying of accepted draft 5 copies (approximately 500 pages)	@ 2.00 per page	5,000.00	5,000.00
Binding thesis 5 copies	@ 500.00	2,500.00	25,000.00
Contingencies			20,000.00
TOTAL			**137,000**

APPENDIX 7: MAP OF STUDY AREA



Source: Maigut *et. al.*, 2012

Figure 2: Uasin Gishu County Map

APPENDIX 8: IREC FORMAL APPROVAL

INSTITUTIONAL RESEARCH AND ETHICS COMMITTEE (IREC)

MOI TEACHING AND REFERRAL HOSPITAL
P.O. BOX 3
ELDORET
Tel: 33471/2/3

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

Reference: IREC/2015/55
Approval Number: 0001523

5th August, 2015

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

INSTITUTIONAL RESEARCH & ETHICS COMMITTEE
05 AUG 2016
APPROVED
P. O. Box 4606-30100 ELDORET

Dear Ms. Wanyonyi,

RE: FORMAL APPROVAL

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

"Determinants of Effectiveness of Implementation of Innovative Instructional Methods in BSC, Environmental Health Curriculum and Possible Intervention in Moi University."

Your proposal has been granted a Formal Approval Number: ***FAN: IREC 1522*** on 5th August, 2016. You are therefore permitted to begin your investigations.

Note that this approval is for 1 year; it will thus expire on 4th August, 2017. If it is necessary to continue with this research beyond the expiry date, a request for continuation should be made in writing to IREC Secretarial 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 CEO - MTRH Dean - SOP Dean - SOM
Principal - CHS Dean - SON Dean - SOD

APPENDIX 9: RESEARCH PERMIT

P. O. Box 4606-30100
ELDORET, Kenya.
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Tel/Fax: +254 053 20 31637
Office Tel: +254 726202203
+254 770071740
Website: www.mu.ac.ke

MOI UNIVERSITY
COLLEGE OF HEALTH SCIENCES
SCHOOL OF PUBLIC HEALTH
Office of the Dean

22nd August, 2016

Ms. Wanyonyi Mary Nekesa,
SM. PhD ME 09/14,
Medical Education Department,
Moi University,
P.O Box 4606,
ELDORET

RE: REQUEST TO CARRY OUT RESEARCH.

Reference is made to your letter dated 15th August, 2016 on the above subject.

Your request to carry out research on the "**Determinants of Implementation of Innovative Instructional Methods in Public Health Programme and Interventions in Moi University",** School of Public Health has been approved.

Wishing you well in your research studies.

DEAN SCHOOL OF PUBLIC HEALTH MOI UNIVERSITY 22 AUG 2016

PROF. G.A.K. ETTYANG
DEAN, SCHOOL OF PUBLIC HEATLH