UTILIZING SKILLS LABORATORY RESOURCES TO ENHANCE CLINICAL CLERKSHIP COMPETENCE AMONG ORTHOPAEDIC MEDICINE STUDENTS AT THE UIAMS, MULAGO, KAMPALA DISTRICT.

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OCTOBER 2016

DECLARATION

I the undersigned declare that this action research report is my original work and that it has never been presented anywhere else for any academic endeavour

SEMAHORE Christopher

Sign.....

Date.....02/11/2016.....

APPROVAL

This research report entitled **"Utilizing Skills Laboratory Resources to Enhance Clinical Clerkship Competence among Orthopaedic Medicine Students at Mulago"** has been done under our supervision. It has been submitted to the graduate school for examination with our approval as the student's supervisors.

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Dedication

To my family and Orthopaedic Medicine Faculty

Acknowledgement

With all due adoration to the Almighty God for His incomparable grace and His unending loving kindness. Special thanks to NORHED for their generosity towards the knowledge provided and all the associated support. I am grateful to the program coordinator Mr. Serwaniko Chris without whom the NORHED project would be only in the news. I would like to express my sincere gratitude to our mentors, facilitators and colleagues for moulding me into an agent of change. Thanks to the staff of the Uganda Institute of Allied Health and Management Science headed by Dr. Rwandembo Willison, Mr Otim Alfred and the entire staff of the School of Orthopaedic Medicine under the leadership of our treasured Principal Tutor Ms Munyigwa Scholastica. To the orthopaedic fraternity I cannot express how much I owe you, especially Mr Kitemagwa Dirisa, and Mr. Bashasha Desire.
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TABLE OF CONTENTS

DECLARATION..... i
APPROVAL..... ii
Dedication..... iii
Acknowledgement..... iv
TABLE OF CONTENTS..... v
List of tables..... viii
List of figures..... ix
List of Appendices..... xi
Abstract..... xii
CHAPTER ONE: INTRODUCTION
1.0 Overview of the study..... 1
1.1 Motivation of undertaking the study..... 2
1.2 Background of the study..... 3
1.2.1 Theoretical Background..... 4
1.2.2 Conceptual Background..... 4
1.2.3 Contextual Background..... 6
1.3 Situational Analysis..... 7
1.3.1 Document analysis..... 7
1.3.2 Work Process analysis..... 7
1.4 Problem Identification..... 9
1.4.1 Future Workshop (FW)..... 9
1.4.2 Future Workshop Findings..... 11
1.5 Problem Statement..... 12
1.6 Participants' formulated general Objective..... 13
1.7 Specific objectives of the study..... 13
1.8 Research questions..... 14
1.9 Significance of the Study..... 14
1.10 Justification of the study..... 15
1.11 Assumptions of the study..... 15
1.12 Conceptual Framework..... 16
1.13 Scope of the Study..... 17
1.13.1 Geographical Scope..... 17
1.13.2 Content Scope..... 17
1.13.3 Time Scope..... 17

1.14 Limitations 18
1.15 Definition of operational Terms 19
CHAPTER TWO: LITERATURE REVIEW
2.0 Introduction 20
2.1 Resources needed to establish a functional Medical skills lab 20
2.2 Skills Lab-based training Interventions Implemented to enhance clinical clerkship competence 21
2.3 Monitoring and evaluation of the outcomes of skills lab-based training in clinical clerkship 23
CHAPTER THREE: METHODOLOGY
3.0 Introduction 26
3.1 Research Design 26
3.2 Study Population 26
3.3 Ethical issues in data collection 27
3.3.1 Informed consent 27
3.3.2 Anonymity and confidentiality 28
3.3.3 Data storage and access 28
3.4 Data Collection Methods and Instruments used 28
3.4.1 Document Review 29
3.4.2 Focus Group Discussion 29
3.4.3 Observation 29
3.4.4 Interviews 30
3.4.5 Photography 30
3.4.6 Reflection 30
3.5 Validity and Reliability 31
3.5.1Validity 31
3.5.2 Reliability 31
3.6 Procedure for data collection 32
3.7 Data analysis and Dissemination of Results 33
3.7.1 Qualitative analysis 33
3.7.2 Transcription of data 33
3.7.3 Coding and categorizing 33
3.7. 4 Interpretation and drawing of conclusions 34
3.8 Dissemination of Results 34

CHAPTER FOUR: ACTION IMPLEMENTATION AND EVALUATION
PRESENTATION, ANALYSIS AND INTERPRETATION OF RESULTS 35
4.0 Introduction 35
4.1 Resources identified and organized to establisha functional skills lab. 36
4.1.1 Skills lab curriculum materials 36
4.1.2 Reflection on emerging issues 40
4.1.3 Future Workshop on Evaluation and Grading Software System 40
4.1.4 Focus Group Discussion on the Skills lab Human resource Development 42
4.2 Interventionsimplemented to enhance skills lab-based training. 43
4.2.1 Needs Assessment 43
4.2.2 Simulation 44
4.2.2 The role of specialized unit professionals as Human Resource 45
4.3 Monitoring and evaluation outcomes of the implemented interventions 47
4.3.1 Overall scores from practicum sites rotations 47
CHAPTERFIVE: DISCUSSION, CONCLUSION AND RECOMMENDATIONS
5.0 Introduction 50
5.2.1 Establishment of a functional skills lab by utilizing the available resources 51
5.2.2Implementation of interventions to enhance training in clinical clerkship competence 53
5.2.3Evaluation of the outcomes of the implemented interventions 54
5.3 Conclusion 55
5.4 Recommendations 56
REFERENCES 59
APPENDICES

List of tables

Table 1.1: Clinical Clerkship competence Gaps 8
Table 1.2: Summary of Methods, Instruments used and Purposes for FW data collection 11
Table 4.1: Action Plan for Participatory Implementable Interventions 36
Table 4.2: Checklist of available skills lab resources 38
Table 4.3: Team players' opinion on use of available skills lab resources 39
Table 4.4: Students' pre-test on skills level self- assessment (needs assessment) 43
Table 4.5: Team players' opinion on their involvement as human resources available for the skills lab-based training of OPM students in clerkship competence 46
Table 4.6: Overall average scores from units' rotations of one-group Pre-Post skills lab-based training 47
Table 4.7: Team players 'reflection on outcomes of the interventions implemented 48

List of figures

Figure 1:1 Action Research cycle 2

Figure 1.2: Stakeholders being facilitated on work process and document analyses during the FW held at the UIAHMS boardroom (Photo by a stakeholder, November 26, 2016) 8

Figure 1.3: Record of Group discussion outcomes during FW meeting held at the UIAHMS, Mulago *(Photo by researcher, November26, 2015)* 12

Figure 4.4: An assortment of existing skills lab resources organized for training OPM students *(Photo by OPM Stakeholder, April 26, 2016)* 37

Figure 4.5: Skills lab resources for learning anatomy 37

Figure 4.6: X-Ray viewing Box in use 37

Figure 4.7: The Institute Administration in attendance during the 2nd FW meeting at UIAHMS-Mulago, *(Photo by the researcher, April 26, 2016)* 40

Figure 4.8: A second FW meeting discussing the relevance and validity of the evaluation and grading system software in skills lab at Mulago 41

Figure 4.9: Stakeholders in the established skills lab 42

Figure 4.10: Third meeting with stakeholders on OPM Human Resource Development and Motivation held at the school of OPM skills lab Mulago 42

Figure 4.11: Random pairing of students 44

Figure 4.12: Students receiving Study Guides 45

Figure 4.13: Simulation in practice: POP casting practice 45

List of Acronyms and Abbreviations

AR	Action Research
CPD	Continuous professional development
FW	Future Workshop
ICT	Information, Communication Technology
MVP	Masters of Vocational pedagogy
OO	Orthopaedic officer
OPM	Orthopaedic Medicine
PAR	Participatory Action Research
SBME	Simulation-Based Medical Education
UAHEB	Uganda Allied Health Examination Board
UIAHMS	Uganda Institute of Allied Health and Management Sciences
LAB	Laboratory

List of Appendices

Appendix I: Consent Form

Appendix II: Skills Lab Resources Checklist

Appendix III

Appendix IV: Pre-Clinical Clerkship Skills Level Assessment

Appendix V: Work Process involved in producing a standard competent clinical clerk

Appendix VI: Evaluation Form on Student Clerkship Performance during Clinical Rotations

Appendix VII: Observational Checklist of Core Competences Expected during Clinical Rotations

Appendix VIII: Individual or Group Reflection interview Guide

Appendix IX: Evaluation and Grading Software Template

Appendix X: Map Showing Study Site at UIAHMS- Mulago

Appendix XI: Letter of introduction

Appendix XII: Team Players' Meeting at UIAHM

Appendix XIII: Future Workshop on Evaluation and Grading System Software on 26/4/2016

Appendix XIV: Clinical Clerkship Future workshop 26/11/2015 Attendance list

Appendix V: Clinical Clerkship Future workshop – Mulago 26/11/2015 Attendance list

Abstract

The study sought to address the problem of declining clinical clerkship competence among Orthopaedic Medicine students at the Uganda Institute of Allied Health and Management Sciences, Mulago.The main objective of the study was to utilize available skills laboratory resources to enhance clinical clerkship competence among the orthopaedic medicine students. A participatory qualitative action research design was employed guided by the future workshop model of action research. Participation in the study was voluntary involving sixty four stakeholders of the School of Orthopaedic Medicine. Forty two of these were year three students, two orthopaedic surgeons/lecturers, three administrators, two principal tutors, nine senior orthopaedic officers, one ward matron, two parents, and three information and communication technology specialists. Future workshops, document review, questionnaire, interviews, focus group discussions, observation, photography, pre-posttest evaluation were used as methods of data collection. Both descriptive and comparative approaches were used to analyze the data. In its preliminary phase, the study found out that there was lack of; clinical clerkship curriculum, key essential curriculum materials for establishing a functional skills lab, clinical instructors, coordinators, technician and reliable evaluation and grading system for timely feedback. On evaluation of implemented interventions, it was found out that some skills lab resources such as a clerkship curriculum and 8 study guides were acquired 5/8(62.5%) of which were practiced). In post skills lab-based training evaluation, 24/42 (57.1%) of thestudents got an outstanding overall average score of over 80 % during their four weeks-long practicum rotations while only 1/42 (2.4%) of the same traditionally trained group got an outstanding score. The number of students rated incomplete in the traditionally trained group reduced from 13/42 (31%) to 6/42 (14.3%). Of all the team players 11/12 (91.7%) believed that lack of funds was a key factor that stalled the action plan to be fully implemented. The key attributes for the success attained involved guiding students carry out the assigned procedural tasks and stakeholders'commitment to support training the students using the available resources at the practicum sites. It was concluded that utilisation of available skills lab resources considerably improved clerkship competence among students at the school of Orthopaedic Medicine-Mulago. Adopting the use of skills labs in the institute, establishment of a fully-fledged and well equipped skills lab, recruitment of skilled manpower to run the skills lab were among the recommendations made. Another Future Workshop should be held to facilitate the stakeholders to re-plan new strategies for solving the pending issues related to equipping the current skills lab and improving on the available resources.

CHAPTER ONE: INTRODUCTION

1.0 Overview of the study

The study sought to address the problem of declining clinical clerkship competence among orthopaedic medicine students at the Institute of Allied Health and Management Sciences, School of Orthopaedic Medicine, Mulago using an action research approach. Action Research is a type of research methodology that aims at improving situations in the community or organization through involvement of stakeholders. It also aims at increasing understanding on the part of the researcher or the client, or both and often some wider community. This chapter therefore covers the motivation of undertaking the study, overview, background of the study, situational analysis, problem identification, problem statement, objectives, significance, scope and assumptions of the study.

This study was a second cycle of action research following a study that was carried out at the School of Orthopaedic Medicine, Uganda Institute of Allied Health and Management Sciences (UIAHMS), Mulago in March 2015.The study focused on improving hands-on competences among OPM students. A future workshop that was attended by important stakeholders of OPM School revealed that a skills lab, which is a major component in attaining practical skills was lacking. Participating stakeholders made observations, monitoring and recording of emerging issues from the beginning to the end during their routine work to evaluate the progress of the intended implementations deliberated upon during the FW session. At the end of the action cycle team players used an observation checklists and field notes to critically reflect on how effective the proposed changes were; what the emerging issues to learn from were and, barriers to change and how these changes could be improved to make a better future. It was realized that when students go for their clinical placements, they still find it difficult to translate the theory taught in class into practice.

It is on the basis of the outcome of this critical reflection that the researcher sought to facilitate stakeholders in a second cycle of action research aimed at fine tuning training through utilizing available skills lab resources to improve on the existing decline in clinical clerkship competence among orthopaedic medicine students. The cyclic process of action research (AR) alternates between action and critical reflection (Fig 1) and as the cycles

progress a greater understanding is developed through the continuous refining of methods, data and interpretation (Dick, 2007; McTaggart, 1991).

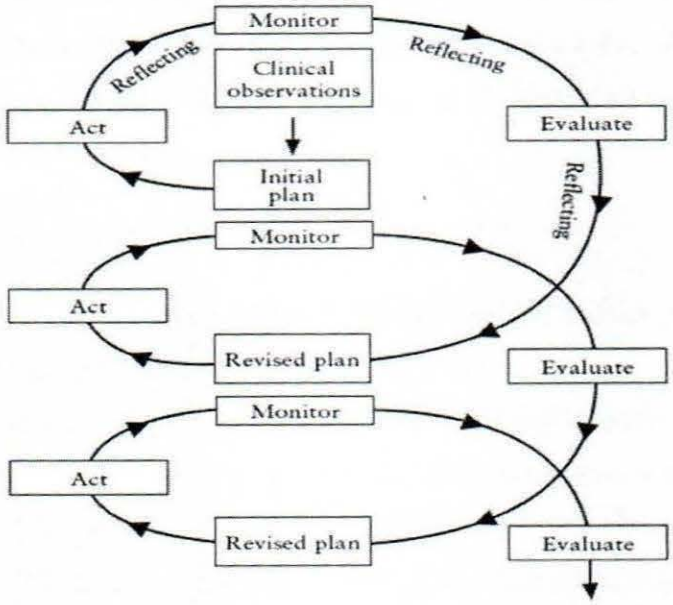

Figure 1:1 Action Research cycle

1.1 Motivation of undertaking the study

The researcher was motivated by a quest to understand and improve the existing problem of declining clinical clerkship competences among orthopaedic medicine students after an intriguing exposure to the Masters in Vocational Pedagogy (MVP) Program at Kyambogo University (KyU). The researcher had been working with Mulago national referral and teaching hospital for over two decades as an orthopaedic officer, and eight years as a part-time tutor at the School of Orthopaedic Medicine (OPM). The researcher always attended weekly departmental meetings that included all cadres of the entire staff, and this constituted a valuable source of information about the training of OPM students in hands-on skills for clinical care of orthopaedic patients. The need for improving training methods was always raised.

While at Kyambogo University (KyU), the researcher was equipped with the competence to use the Participatory Action Research (PAR) methods in collaboration with stakeholders in Vocational Education and Training (VET) institutions and vocational work places to improve student training. Through MVP modules in vocational action research

methods, curriculum development, implementation and evaluation and research expeditions, the researcher was endowed with the competence to facilitate stakeholders to organize and participate in Future Workshops (FW) as platforms where they could identify challenges, air out their views justifiably and come up with agreeable implementable interventions to improve situations. The researcher was further motivated as participants through action research approach made it possible for him to implement his idea as an agent of change through their collaborative work.

1.2 Background of the study

For various reasons, there is a decline in the standards of bedside clinical teaching with resultant decline in students' and doctors' clinical skills (Gonzalo et al., 2014). Profound advances in diagnostic technologies have shortened hospital stay of patients who are the potential materials for bedside teaching. Besides, as the economy stabilizes, the bulk of patients' care has shifted away from hospitals to primary care units, private clinics and tertiary or super specialized health centers. As a result, the time spent at teaching rounds has become much shorter than in the golden era of bedside teaching up to early 1970s (Mel-B, 2002).With the increasing awareness of their rights (consumerism), patients' consent to being part of medical education is no longer to be taken for granted, both in primary and secondary care (Monnickendam, 2006).Like elsewhere in the world, Mulago hospital is not exceptional to such developments. In our setting, the main reason for decline is that students are unsupervised as a result of lack of employed tutors, clinical instructors and clerkship coordinators. Due to these factors, the traditional bedside teaching has become deficient in providing comprehensive training in clinical skills (Dent, 2002). As a result innovations have been devised to address this decline by encouraging the use of skills labs as an alternative training resource.

There are many advantages of training in skills labs. It is assumed that skills laboratories have a potential to bridge the gap between the classroom and the clinical setting(Boulay & Medway, 1999), ease the learning of practical clinical skills (Ledingham, 1998), and guarantee that students achieve an adequate level of clinical competence. It allows structured clinical teaching, independent of real patients with the opportunity to initially practice clinical techniques on simulators, in a safe environment, without affecting the quality of patients' care in anyway. A skills lab can help to ensure that all students have the

confidence, necessary learning opportunities and appropriate assessment before approaching real patients; with immediate feedback and chances of rehearsal and consolidation of learning materials. A skills lab is relevant and effective for inter-professional learning as it enables students from different professional backgrounds to learn about one another in a context that is not profession specific (Dent, 2002).

1.2.1 Theoretical Background

Discussion in this section is grounded on the experiential theory of learning (ETL) put forward by Kolb (1984).The ETL describes a process where knowledge is created through the transformation of experience. This type of learning is different from other learning theories as it acknowledges experience in the learning process (*Strategies, research, and theory for college and university teachers*, 2011). For example, the cognitive learning theories emphasize cognition of affect, while behavioral learning theories tend to omit the role of subjective experience in the learning process (Cantor, 1997; Haynes, 2007b). These experiences can take place within or outside of the classroom, and are most effective when they offer meaning to the student (Svinicki & McKeachie, 2011).

The experiential learning process involves a number of steps that offer a "hands on" experience to students and helps them engage with the content and reflect upon the application (Haynes, 2007a). According to Wilkinson, Nutley, and Davies (2011) , an experiential learning activity must include exploration, sharing, processing, generalizing, and application. This requires the student to perform an activity or task, share the results and observations, discuss and then reflect on the process, connecting it with real world examples and applying it to another situation. These steps help demonstrate to the student that while the traditional content is important, a major factor is the learning process, which is at the center of experiential learning.

1.2.2 Conceptual Background

The study looked at clinical skills lab resources as an independent variable and enhancing the clerkship competence as the dependent variable. The skills lab scopes included clerkship curriculum materials, the quality of teachers, methods of instruction, the clerkship syllabus and the time available for practice. The clinical clerkship competence had domains such as patient care, medical knowledge, practice-based learning, interpersonal and communication skills, professionalism and system-based practice (management of

responsibilities). These skills were rated on a Likert scale as either unsatisfactory, incomplete, proficient, advanced or outstanding (Appendix VI). The relationship between the aforementioned domains was moderated by six attributes specifically the school administration's willingness to equip and maintain the skills lab, the level of participation of experts (physicians), user friendly comprehensive evaluation and grading system, timely feedback, learners' achievements analysis and participatory reflective meetings (Future Workshops) responsible for drawing up plan of action to effect change or improvement.

During clinical clerkship training, students were required to rotate through different medical specialties and manage patients under the supervision of professionals (physicians). Students obtained patient histories (patient's data), carried out complete physical examinations, requested for relevant investigations, made diagnoses, drew treatment plans, wrote progress notes, and assisted in surgeries and other medical procedures. The work hours were that of a full-time job position, generally similar to that of a qualified officer (Ludmerer, 1999). Clinical clerkship provides supervised, high quality opportunities for students to apply and transform the declarative medical knowledge and basic clinical skills that they have acquired into procedural clinical competence, while also functioning as learning members of health care teams (Yurvat, 2014).

Scholarly findings show that clinical simulation in skills labs is one of the procedures used in health-care education that is performed in a situation that mimics a clinical setting in order to learn the technical skills and competencies required for health care (Bradley, 2006). Simulation-based learning has been defined as the "reproduction of some aspect of reality to better understand, manipulate or predict real behavior" (Kneebone, 2005, p. 86). Other terms associated with simulations have included 'surrogate' or 'recreation' of reality, an activity that mimics reality, a controlled environment, immersive or guided experiences, fully interactive tasks, activities comprising of techniques rather than technology, and a replacement or amplification of real experiences with guided experiences that are often immersive in nature (Gaba, 2001).

The desire for patient safety and quality in patient care is the driving force in accelerating the development of simulation-based medical education (SBME) around the world. The main objective of SBME is focused on obtaining clinical skills belonging to the psychomotor domain. Furthermore, it can be used for not only education of the cognitive

domain, such as knowledge, but also education of the affective domain, for example, communication training by the session with simulated patients.

1.2.3 Contextual Background

The study was carried out at the Uganda Institute of Allied Health and Management Sciences (UIAHMS), School of Orthopaedic Medicine (OPM) at Mulago. The Institute was established in 1923 with one program but currently runs 23 programs. The School of Orthopaedic Medicine has been in existence since 1962 and learners have been acquiring skill through training at work. A school which started with 3 students now has a population of over 150 students yet the facilities have not changed much. It is located on Mulago hill, 3 Km north of Kampala city. It neighbours Mulago National Referral and Teaching Hospital, Makerere University College of Health Sciences and Mulago School of Nursing and Midwifery.

The student population at Mulago National Referral and Teaching Hospital is generally on the rise as many private and public institutions utilize it as a practicum site for their students. Since its inception, the OPM curriculum has been reviewed twice the current one being in 1993. The existing methods of instruction and the increasing number of enrollment of OPM students have negatively impacted on students' learning of hands-on (clinical) skills. Strategies for enhancing students' clinical skills are therefore needed as there are fewer hours available for skill development due to not only a rigid curriculum that is highly centralized but also a congested learning environment and busy schedules of potential instructors.

Clinical education at Mulago Hospital takes place in form of clinical clerkship in various units of the hospital. Orthopaedic Medicine students are exposed for a specific period of time to medical specialties such as orthopedics, nursing, general surgery, internal medicine and paediatrics. Students rotate from one unit to the other as faculty members follow them up while residents, general practitioners, orthopedic officers and nursing officers act as their primary teachers (Instructors). The teaching team is accountable to the curriculum committee of the school. Evaluation data provides them with the information to improve and control the quality of the clerkship.

1.3 Situational Analysis

The researcher engaged key stakeholders in an initial reflection with the following question: "Would use of available skills lab resources better prepare students for clinical clerkship?" This preliminary observation and critical reflection was needed to convert a broad concern to an action theme which became the topic of discussion later on. This initial reflection became the point of departure for the researcher to look for relevant secondary data by analyzing the documents and work processes required to produce a competent orthopaedic officer. The status of the existing situation in relation to the theme of the study was highlighted with the help of work process analysis and documentary review as research tools. While carrying out the situational analysis, standard curricula on clinical clerkship and work processes involved in producing a competent orthopaedic officer in clinical clerkship were analyzed. This exercise enlightened the participants with information to base on while making a decision to either modify the existing OPM teaching techniques or adopt the standard one.

1.3.1 Document analysis

According to Kumar (2015), the document analysis technique enabled the researcher in the initial stages of the study to establish the theoretical roots of the study, clarify ideas and develop the methodology and in the later stages it helped to consolidate knowledge. Documents reviewed comprised of admission requirements, clerkship curriculum, class attendance register, students' logbooks, formative and summative score sheets, time table, standardized and existing clinical clerkship syllabuses, available skills lab resources inventory, literature on skills lab-based training in clinical clerkship competence among others (Kilminster & Jolly, 2000). The document analysis was helpful in identifying gaps within the current modes of OPM clinical clerkship training syllabus.

1.3.2 Work Process analysis

Work process analysis was helpful in defining clerkship core competencies needed to perform concrete work (Appendix V). The process initially begun with an assessment of the current OPM clinical clerkship curriculum. The findings were compared with the conventionally standardized curriculum to identify the existing training gap (Table 1.1).

Table 1.1: Clinical Clerkship competence Gaps

Clinical clerkship Core Competences	Number of Documented Standard Clinical clerkship Objectives	Number of clinical clerkship Objectives Practiced at school of OPM	Discrepancy
Patient care	13	8	5
Medical Knowledge	9	5	4
Practice-based learning	4	1	3
Interpersonal and Communication skills	3	1	2
Professionalism	10	5	5
System-based practice	7	3	4
Totals	**46**	**23**	**23**

Source: Secondary Data from work process analysis of core competencies in clinical clerkship as adapted from University of Iowa (Hansen, Ferguson, Sipe, & Sorosky, 2005)

Secondary data obtained was presented to the future workshop that took place on 26th Nov 2015 using a computer and a projector as shown in Figure 1.2 below:

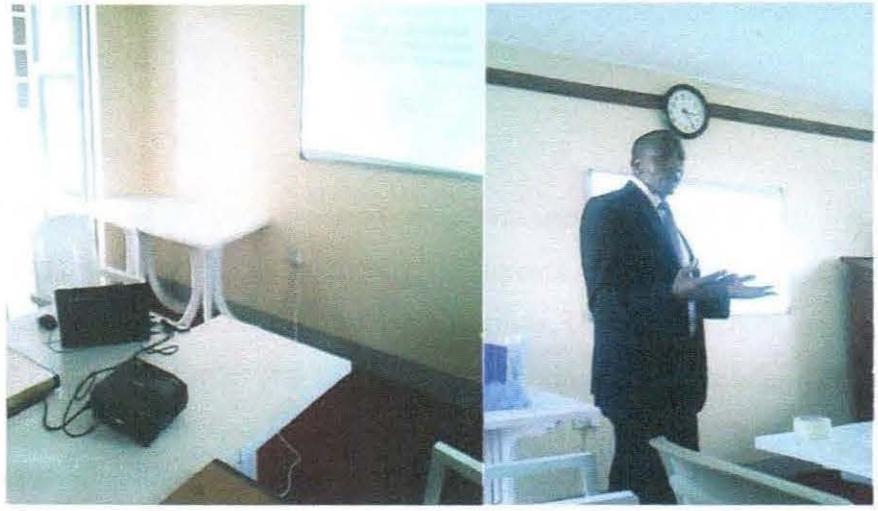

Figure 1.2: Stakeholders being facilitated on work process and document analyses during the FW held at the UIAHMS boardroom (Photo by a stakeholder, November 26, 2016)

A future workshop (FW) was employed as a technique meant to shed light on a common problem of declining clinical clerkship competence, to generate visions about the future, and to discuss how these visions were to be realised(Müllert & Jungk, 1987). This was

done to prepare the participants to make informed decisions. Future workshop participants used this data to determine the steps to be taken to move syllabus from the current state to the desired formalized one for future use.

1.4 Problem Identification

Action research arises from a problem, dilemma, or ambiguity in the situation in which practitioners find themselves (Lewin, 1946). It may be at the level of a general concern, a perceived need, or a course-related problem. In this case stakeholders practicing orthopaedic medicine noticed that there was increasing decline in clinical clerkship competence among OPM students. They also realized that when students go for their clinical placements, they make little translation of the theory learnt into practice as expected. For this concern to be translated into an action research project, the researcher agreed with key stakeholders (professionals) to make it more tangible so that it becomes relevant to change or improvement. With the support of collaborative research tools such as dialogue and Future Workshop in focus group discussions, an agreed theme entitled "Utilizing Skills Laboratory Resources to Enhance Clinical Clerkship Competence among Orthopedic Medicine Students in Mulago" was formulated.

1.4.1 Future Workshop (FW)

Future Workshop as an action research model was used to collect essentially qualitative data using tools such as questionnaire, documents, observational checklists, camera, audiovisual recorder and reflection interview guide. Using these tools, a lot of data was gathered from multiple sources and all facts needed during the FW session were prioritized, triangulated and verified for action. According to Müllert and Jungk (1987), there are about five phases of "classic" futures workshop (preparation, critique, fantasy, implementation, and the follow-up phases).

During the preparation phase, preliminary observation and critical reflection was instrumental to convert a broad concern to an action theme which became the topic of the FW. In this phase, information from prospective respondents (key stakeholders) to start with was obtained through informal and conversational unstructured interview. These key stakeholders, the MVP program coordinators and the researcher (facilitator) of the workshop mutually agreed upon the FW theme (topic), participants to be invited, and the program,

(methods, time schedule, rules and regulations) to guide the FW session. The venue and local facilities needed for the workshop were settled.

Through the critique phase the problem was critically and thoroughly thought about and investigated. Challenges responsible for declining OPM clerkship incompetence were identified, prioritized and documented. Through brainstorming as the preferred creative technique, data was collected by structuring and grouping of ideas in main sub-themes.

During the fantasy phase participants tried to work a utopia by drawing an exaggerated picture of the future developing an 'idea store' from which implementable strategies were drawn. In this phase, an attempt was made to solve the problem without reflecting on restrictions, surrounding conditions, or barriers. Critique points were turned into the opposite (bad to good), not criticizing ideas on the assumption that all resources were available even in excess. During the subsequent phase of brainstorming and 'idea store' recording, photography and notes taking techniques were used. The social fantasies of the participants were developed in this phase allowing them to liberally dream big.

The implementation phase was characterized by checking and evaluating ideas found in the fantasy phase leading to what concerned their practicability. The data obtained were used to make an action plan.

The study being cyclical in nature was concluded with the reflection and re-planning phase. Unmet interventions were identified and reflected upon and the ways to improve the current situation were noted for further intervention. In this phase, the sequence of activities that were performed included working out an action plan, implementing action points, follow-up (reflection), evaluation, and re-planning where it was found necessary.

During this phase, data about the progress of the project was documented using an observational check-list, a pen, journal, camera, audiovisual recorder as tools to record sequence of events as they unfolded. Information gathered was helpful for individual and team players' reflection guided by reflection interview guide (Appendix VII). Results were used to execute desirable changes to re-plan or improve situations. Techniques for observation were continuously used before, whilst and after a change took place, to examine the effect of the action taken. Responsible persons (team players) formed focus groups to reflect and discuss on reports about the effects of the changes observed during the implementation of their respective assigned tasks. The following table 1.2 represents the

summary of methods, instruments used during FW session and the purposes of each FW phase in data collection.

Table 1.2: Summary of Methods, Instruments used and Purposes for FW data collection

FW Phase	Method	Instruments/Tools	Purpose
One	Unstructured interview (informal , conversational), dialogue, document review	Unstructured interview guide, existing and standard curricula, Work process for clerkship competence	Identification of key stakeholders, problem identification, formulation of FW theme (topic),documenting facts
Two	Power-Point presentation, no discussion but listening, observation, brainstorming, documentation of findings, Audio-visual recording, Photography.	Projector, computer, camera, manila papers, markers, Audio-visual recorder, camera, journal, pen, flip-over chart	Criticism of a "bad" existing solutions/situations, systematization (clustering) ,condense, deepen, prioritization of findings
Three	No discussion but free presentations, observation, Audio-visual recording, Photography	Eyes, Camera, Journal, Audio-visual recorder, camera, pen, manila paper marker, flip-over chart	Attempt to solve the problem without reflecting on restrictions, surrounding conditions, or barriers Turn critique points into the opposite (bad to good),not criticizing ideas
Four	Group discussion, observation, audio-visual recording, photography	Record of extracted or "idea store", audio-visual recorder, photography, eyes, journal, pen, flip over chart	A common analysis of these expositions with regard to good solutions / ideas, open minded - free thought intended to pick up other thoughts, modify, develop them further to produce many ideas in bid to find a good ones
Five	Group work of team players, individual and group reflection, monitoring and evaluation	A record of implementable solutions extracted from "idea store "or the best suited concepts, reflection report or journal	Analysis/value the concepts of the "idea store" regarding realistic conditions (ones that can be implementable),Work out an action plan, implement, follow-up (reflect), Evaluate, re-plan where necessary.

1.4.2 Future Workshop Findings

Findings of the FW meeting included but not exclusively lack of the following in their order of priority: clerkship curriculum; study objectives; inventory and organization of available skills lab resources; curriculum materials (mannequins, models, figures, charts; DVDS; animated diagrammatic representations); study guides; ward and surgical equipment; consumables; adequate time for practice; evaluation and grading system software; appointment of clerkship coordinators and skills lab technicians, and appointment and training of clinical Instructors.

The cumulated data collected from each of the five phases of the FW were documented as illustrated in figure 1.3 below. Participants used this information (Primary data) cumulatively

to draw conclusions about relationship between skills lab resources and clinical clerkship competence. Participatory implementable interventions were agreed upon and an action plan was drawn. Voluntary team players included three administrators, six faculty members (three tutors and three clinical instructors), six students, one researcher, and three ICT experts making a total of 19 team players as responsible persons to ensure the implementation of participatory identified action points.

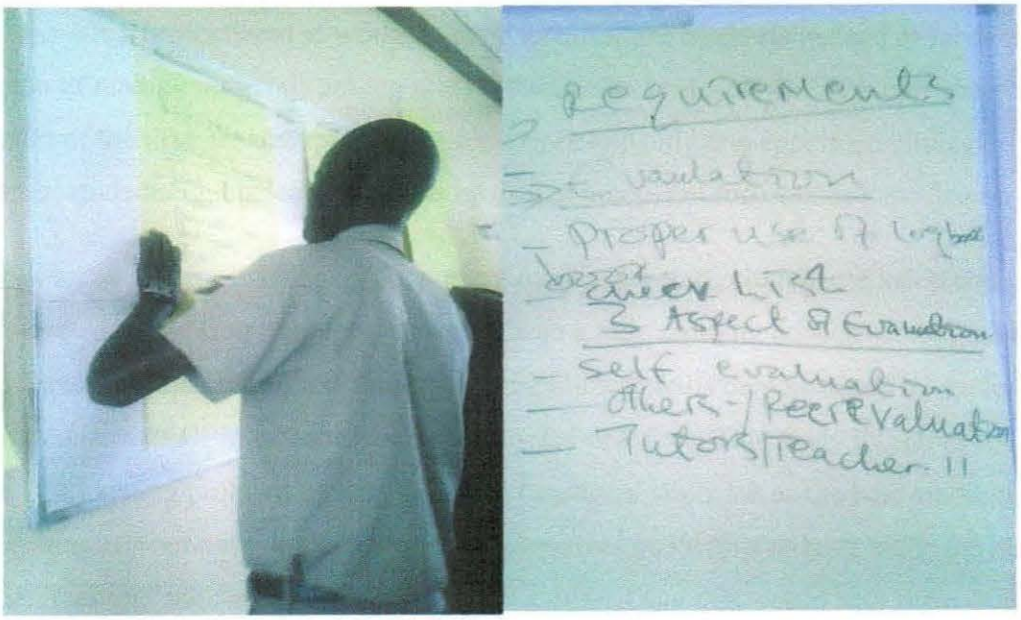

Figure 1.3: Record of Group discussion outcomes during FW meeting held at the UIAHMS, Mulago ***(Photo by researcher, November26, 2015)***

1.5 Problem Statement

Declining clinical competence among OPM students at the UIAHMS Mulago was the primary concern of school of OPM stakeholders. A clinical skills lab facilitates learning by providing the faculty and students with the setting, models, equipment, and supplies necessary to develop and enhance hands-on clinical skills through clinical exposure, feedback and evaluation. Clinical skills lab ideally contain a range of models, mannequins, virtual-reality simulators, and diagnostic and therapeutic equipment, as well as adequate spaces suitable for workshops, videotaping and small group learning.

From the situational analysis conducted, stakeholders realized that changes in work routines at hospitals, the increasing numbers of OPM students' being enrolled and patients'

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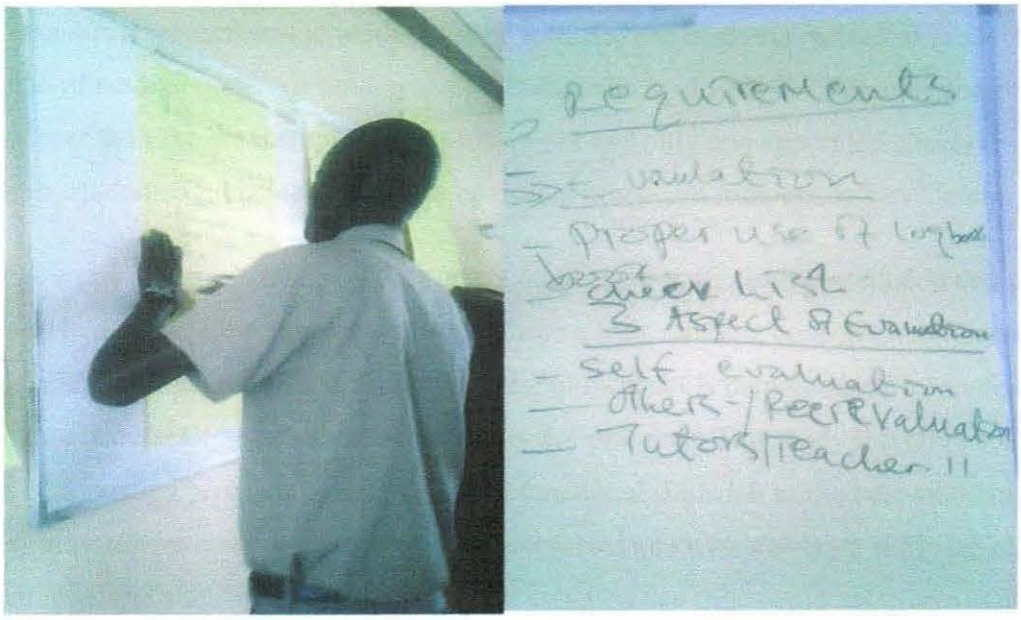

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refusal not to be used as study specimens potentially limit learning opportunities during clinical clerkship (Chittenden, Henry, Saxena, Loeser, & O'Sullivan, 2009).

The Orthopaedic Medicine (OPM) School has no functional skills lab but still relies on traditional means of imparting skills to learners such as bedside teaching, training on job as a student assists a professional at work, didactic lectures, use of charts instead of models and provision of reading materials among others (Parasuram et al., 2014). With only three tutors who most of the time are occupied with office work and only one appointed clinical instructor, students' guidance and follow up during practicum rotations is insufficient.

Despite all efforts made by the current inadequate staff, clinical clerkship competence continues to decline. Consequently, there has been a long standing concern among medical professionals at Mulago hospital about declining clinical skills demonstrated by students and recent graduates of OPM School in their day to-day practices. This study therefore sought to address the existing problem by establishing a functional skills lab as the best medium where learners may conveniently interact amongst themselves and with available skills lab resources like dummies and standardized patients. It was assumed that this would help them acquire simulated skills before transferring their raw cognitive skills learnt in class to actual practice. Unless this was done in time, the quality of orthopaedic patient care was likely to continue declining leading to disabilities and ultimate low socio-economic output. There was a need to enhance students' overall patient care and induction of more positive efficient training beliefs.

1.6 Participants' formulated general Objective

The overall aim of the study was to utilize the available skills lab resources to enhance training in the clinical clerkship competence among Orthopaedic Medicine students at the School of Orthopaedic Medicine, Mulago.

1.7 Specific objectives of the study

The study specifically intended to:

- Establish a functional skills lab by organizing and utilizing the available resources.
- Implement interventions to enhance skills lab-based training in the clinical clerkship competence.

- Monitor and evaluate the outcomes of interventions implemented to enhance skills lab-based training in the clinical clerkship competence.

1.8 Research questions

The present study attempted to answer the following three questions raised during FW plenary session:

i. Are there any available resources that can be utilized to establish a functional skills lab that will enhance training in clinical clerkship competence?
ii. How will the implementable interventions cited by the participants be carried out to enhance skills lab-based training in clinical clerkship competence among OPM students?
iii. How will the outcomes of interventions implemented to enhance skills lab-based training in clinical clerkship competence be monitored and evaluated?

1.9 Significance of the Study

The significance of the study stemmed from a set of considerations. The study dealt with an issue that had received little attention in creating and utilizing skills lab to improve training in clinical clerkship competence. Lack of a functional skills lab in the School of OPM had made it difficult for students to translate their theoretical knowledge into practice and ultimate overall patient care. First, it was assumed that utilizing available skills lab resources to training OPM students would be a key aspect to enhance trainees' skills acquisition in clinical clerkship and thus, a key issue to solving the challenge of incompetence in overall patient care practice.

Second, that training through the skills lab beliefs might have a determinant influence on trainees' confidence when it comes to applying the acquired simulated skills to real situations. Third, improving OPM students training through a skills lab would help them gain proficiency, communication skills, team spirit, changed behavior, resiliency, problem solving skills as they become more creative and ultimately productive in real life situations. This, in turn, would result in better learning outcomes on the part of the school output.

The study tackled the issue of utilizing available skills lab resources to enhance clerkship skills acquisition essential for overall patient care. The study employed FW model of participatory action research methodology as an approach that was considered to be very

effective in planning and conducting participatory interventions for improving training OPM apprentices in clinical clerkship practice. Being stakeholder-initiated and conducted, action research was presumed to be more helpful than traditional research methodologies to facilitate stakeholders in diagnosing and dealing with the problem in question and to quickly respond to their concerns. Action research approach would also create an awareness of the existing problem of declining clinical clerkship competence among OPM students.

1.10 Justification of the study

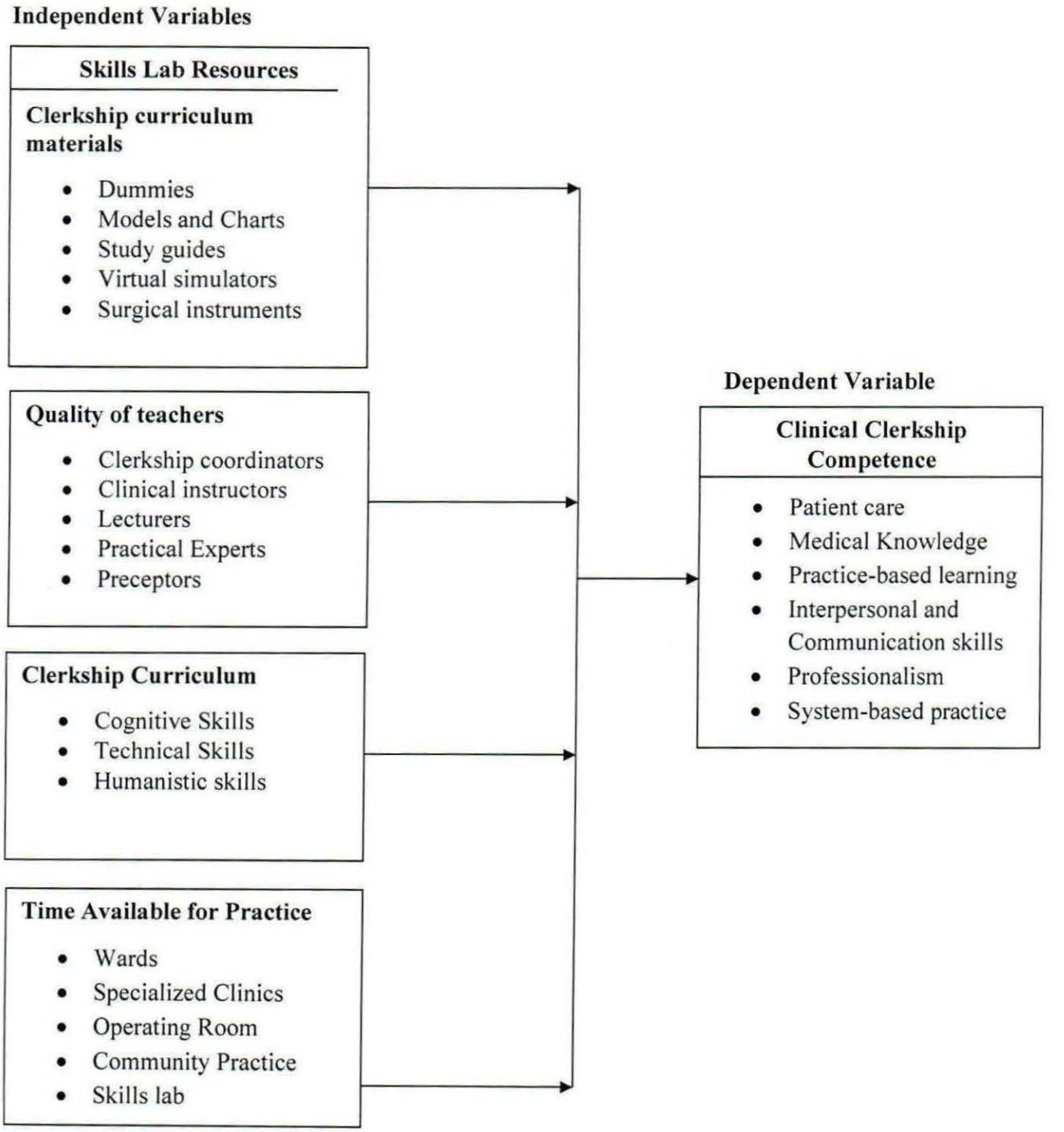
Despite of enormous literature on skills lab-based training in medical institutions, there is no universally accepted account at the UIAHMS as to why school of OPM stakeholders wonder why and how clinical clerkship competence is declining among OPM students. It is clear from existing research works available that there are a number of reasons for such phenomenon though much of the issues rotate around methods of instruction. Therefore this was the basis for carrying out this study.

1.11 Assumptions of the study

It was assumed that:

i. Utilization of available skills lab resources would enhance training in clinical clerkship competencies among OPM students at Mulago.
ii. Participatory execution of the identified implementable interventions would enhance training in clinical clerkship competencies among OPM students at Mulago.
iii. Participatory monitoring and evaluation of the outcomes of the implemented interventions would enhance training in clinical clerkship competencies among OPM students at Mulago.
iv. Improvement would be realized through observation, team players' reflection on emerging issues, fine-tuning emerging issues for improvement or change of action plan.

1.12 Conceptual Framework



Source: Adapted from Armstrong, 2007

Relationship between skills lab resources and clinical clerkship competence.

The study looked at clinical skills lab resources as an independent variable and the clerkship competence as the dependent variable. The range of a skills lab scopes included clerkship curriculum materials, the quality of teachers, methods of instruction, the clerkship syllabus and the time available for practice. The clinical clerkship competence had domains such as patient care, medical knowledge, practice-based learning, interpersonal and communication skills, professionalism and system-based practice (management of responsibilities). The relationship between the aforementioned domains was moderated by six attributes explicitly the school administration's willingness to equip and maintain the skills lab, the level of participation of experts (physicians), user friendly comprehensive evaluation and grading system, timely feedback, learners' achievements analysis and participatory reflective meetings (Future Workshops) responsible for drawing up plan of action to effect change or improvement.

1.13 Scope of the Study

1.13.1 Geographical Scope

The study was conducted at the school of Orthopaedic Medicine, Uganda Institute of Allied Health and Management Sciences (UIAHMS) located on Mulago Hill which is 3 Km northwards of Kampala city.

1.13.2 Content Scope

The study looked at ways of enhancing lab-based training in clinical clerkship competence among OPM students specifically by utilizing the available resources to establish a functional skills lab, implementing the participatory cited interventions, monitoring and by evaluating the implemented interventions.

1.13.3 Time Scope

The study being cyclical in nature had been ongoing since the approval of the proposal in February 2016, the time when the key stakeholders were concerned about the declining clerkship competence among OPM students. During this period of time, there were indicators that the problem was progressively being solved.

Delimitation

i. The study was delimited to the OPM finalists undertaking their practicum rotations on the wards, out- patient department, accident and emergency units, operating rooms, and community health centres.

ii. It was also delimited to students with no prior interactive training in the skills lab setting. Students who may have done self-study in a well-equipped skills lab were excluded from the study.

iii. Examples and activities used in training were drawn from medical textbooks and illustrations conventionally adopted by medical schools for students undergoing clinical clerkship training only, as those are the ones that were presumed to have covered enough basic and clinical science theories.

1.14 Limitations

Clinical clerkship competence training was not enhanced as was anticipated because of lack of funds to purchase several essential skills lab resources such as dummies, models, ward and surgical equipment and for facilitating reflection meetings. Another FW is suggested to fine tune the unfulfilled interventions.

The opinions gathered from a small sample of team players may not have fully represented the view of the majority of practicing professionals who never participated in the study. This in turn could have affected the level of imparting of skills to trainees since many professionals missing in the study meant lack of combined support from all the experts at the practicum sites. A workshop to sensitize the staff about the importance of being involved in training OPM students for national development was successfully held at UIAHMS board room.

The UIAHMS runs 23 programs all housed under one building. The limited resources are shared and most of the time the researcher faced the challenge of organizing the skills lab only to find it dismantled by students from other programs. A senior orthopaedic officer was identified to take charge of the established skills lab.

The study was also limited by clash of time tables of Graduate School and the school of OPM. Quite often the researcher would be released to go and implement interventions and gather data at a time when students would be out of the Institution for field work or would be in examinations. The two bodies were advised to meet and harmonize their work plans.

Mobilizing stakeholders was costly in terms of funds and time as it was not easy to have them actively involved in all plenary sessions due to work overload of patients care.

1.15 Definition of operational Terms

The following definitions were adopted in the current study:

Action research is defined by Checkoway and Richards-Schuster (2004) as teacher-initiated classroom research which seeks to increase the teacher's understanding of classroom teaching and learning and to bring about improvements in classroom practices. Engagement of stakeholders in problem solving ensures implementation of the suggested solutions (Billett et al., 2012).

Clinical clerkship is a level of competency demonstrated by a physician in history-taking, physical examination, interpretation of data obtained from investigations done, clinical decision-making and management of the patient's complaint (Andersen, Buck, Gotian, & Staff, 2005).

Competence refers to knowledge, skill or behavior which must be demonstrated by medical students in order to achieve the primary goal of the medical professional education.

A **Future Workshop (FW)** is defined as a participatory technique meant to shed light on a common challenging situation, to generate visions about the future, and to discuss how these visions can realistically be implemented.

Instructor is a term that is used broadly to include peers, resident physicians, full-time and volunteer faculty members, clinical preceptors, nurses, and ancillary support staff, as well as others from whom students learn

Key stakeholder is an individual that has the required valid and relevant information about the existing problem of clerkship incompetence among OPM prospective graduates.

Skills laboratories are learning resource centers that seek to provide an environment for learning clinical skills in which students can practice without jeopardizing patient care or provoking adverse effects (Brigden & Dangerfield, 2008).

An **Orthopaedic Officer** is an allied health worker who conservatively manages diseases and conditions which affect muscles, bones and joints (musculoskeletal system) and other related health conditions under the supervision of an orthopaedic or general surgeon.

Team players are the implementers of the participatory agreed upon interventions.

Orthopaedic Practice: Students' practical experience during unit rotations

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Orthopaedic Practice: Students' practical experience during unit rotations

CHAPTER TWO: LITERATURE REVIEW

2.0 Introduction

This chapter discusses the literature reviewed in order to understand and investigate the research problem identified. Information from literature review was used to guide the researcher in the formulation of the theories that were aimed at addressing the identified clinical clerkship training gaps. Systematic identification, location and analysis of documented works in relation to utilization of skills lab resources to enhance training in clinical clerkship competence among OPM students was done; specifically in regard to the establishment of a functional skills lab, participatory implementation of intended interventions and monitoring and evaluation of implemented interventions.

2.1 Resources needed to establish a functional Medical skills lab

A clinical skills lab is a multidisciplinary educational facility with teaching and learning resources that provide structured clinical skills training in varied formats and circumstances, to a specified level of competence prior to, or coordinated with direct patient contact (Al-Yousuf, 2004). Clinical skills labs ideally contain a range of models, mannequins, virtual-reality simulators, and diagnostic and therapeutic equipment, as well as spaces suitable for workshops, videotaping and small group learning.

A curriculum for the skills lab is important as it is the basis for the teaching delivered. This is particularly so for undergraduate students, where the skills lab teaching should merge and complement other teaching that occurs in the school and hospital (Frank, 2003). If possible curricula should be agreed upon by all parties who have interests in the education of the students. Also students need guidance both for using the lab, learning in the lab, revision for exams and reminders when in practice. The guidelines should be available to the students and complemented with handbooks and web-based materials that can be updated.
Clinical skills are broadly divided into technical (manual) skills such as aligning broken limbs by closed manipulation, maintaining correct alignment by applying traction or casts on broken limbs, taking blood pressure, carrying out special tests on patients while examining a patient, drawing a blood sample. On the other hand, humanistic skills take account of expertise such as communication that is key in taking a history (patient's data) or educating a patient, interpersonal relationship, professionalism, and problem solving skills, among others.

A well-established skills lab provides an environment for learning clinical skills in which students can practice without jeopardizing patient care or provoking adverse effects. It reduces the difficulties experienced by students when they first encounter hospital equipment, patients on wards and in clinics. Skills lab trainings have been shown to improve procedural skills in novices as well as experts. This applies to complex surgical skills as well as basic clinical skills performed by medical students and experts.

2.2 Skills Lab-based training Interventions to enhance clinical clerkship competence

Patient safety and related ethical issues are frequently cited as major reasons for implementation and evaluation of approaches used to teach health professionals. Consistent with these concerns is the observation that the more complicated and/or invasive the procedure, the more likely it is that simulation will be seen as worthwhile (Greene, Zurakowski, Puder, & Thompson, 2006). While in skills lab, novices learn how to correctly handle and use equipment as well as putting into account work safety and hazard measures.

Skills lab based training or Simulation Based Medical Education (SBME) is of benefit because it offers both learners and patients a safe environment for practice and error (Morgan et al., 2006). Simulations are repeated practice in a safe environment; professional guidance when needed; relevance to actual clinical practice; learning with others in a realistic context and a supportive, learner-centered milieu. Medical learners are allowed to fail a procedure and make mistakes, and they can try a procedure repeatedly until they master it. Since various types of cases or clinical situations can be freely set for simulation training, learners can experience important or rare cases that should be encountered from the viewpoint of medical safety. In the clinical simulation phase, students learn interventional skills. They are more confident and less liable to commit mistakes as they now practice their learnt skills on real patients initially under supervision and later on independently.

The driving forces behind use of simulations in skills labs have been linked to various interests of stakeholders in health care. Educational programs see in simulations an opportunity for improved learning and a competitive edge over other programs or a means of coping with declining clinical education opportunities for their students. For example, by simulation training using a virtual-reality simulator, learners can obtain knowledge of anatomy and physiology in relation to clinical skills (McCloy & Stone, 2001). Simulated based medical education (SBME) is expected to improve educational and clinical outcomes

in comparison with no intervention (Cook et al., 2011). Simulation training in health profession education is consistently associated with large effects for outcomes of knowledge, skills, and behaviors and 4e44moderate effects for patient-related outcomes.

Professional and licensing associations push for improved practitioner performance, maintenance of competence in response to public pressure and government regulation (Donelan, Blendon, Schoen, Davis, & Binns, 1999). Health care organizations aim to improve patient care and efficiency, reduce costs, and position themselves well in the health care market. Reduced costs are also sought by funders of medical care, in addition to reduced errors. Liability insurers want to reduce claims and the related payouts. Governments respond to public pressures to reduce costs, and minimize errors. The public advocates for improved patient care and safety, reduced 'training' on patients, and uniform competence and proficiency of health professionals (Chaudhry et al., 2006). A connection between the benefits of simulated learning experiences and addressing health human resources issues in the U.S nursing profession has been analyzed, so simulated learning may be constructed in some contexts as a means to address professional shortages (Nehring, 2008).In Ugandan context where the ratio of students to patients and even to clinical instructors is high, simulation in skills lab using student to simulate for their colleagues would address this issue of professional shortages.

As a way of bridging the gap between theory and practice, the medical educator can facilitate the transfer from theory to practical work by focusing on a controlled simulation of reality. Certain teaching strategies linked to the use of skills laboratories facilitate practical learning and self-confidence (Morgan et al., 2006). Students acquire unique learning experiences and request time with adequate equipment to get hands-on and visual pre-clinical experiences. In a secure setting, the student's experiences stimulate learning by bridging the gap between 'knowing' and 'doing' (McAdams, Rankin, Love, & Patton, 1989).

One of the identified factors conducive to learning is an atmosphere of play. Humour and creativity increase the motivation for learning, strengthen relationships and improve memorizing while the regular use of available skills lab resources reduce stress levels. During demonstrations and return demonstrations, learners are critiqued by fellow learners in a free and fair atmosphere as a way of helping each other understand the concept being trained in. These individual factors and various techniques affect learning acquisition, but are only parts of a complex whole. Medical skills labs lead to an improvement in procedural skills

compared to traditional training or no training, when assessed by simulator performance and immediately post-training (Lynagh, Burton, & Sanson-Fisher, 2007).

According to scholarly findings, students who undergo skills lab-based training adapt more readily to the clinical field (Palter & Grantcharov, 2010). Many studies emphasize that significant learning takes place during debriefing periods following each simulation as presented in the literature, (Dolly Goldenberg PhD & Carroll Iwasiw EdD, 2005).

A number of authors have outlined features they consider to be essential for the implementation of effective simulations. These include relevance to practice, foundations in educational theory, curricular flexibility and integration, resource support, and appropriate staff development. Postlethwaite (2003) and Issenberg (2002) have defined what they consider to be essential features of simulation-based learning. Inclusive of these is timely feedback which is considered by these authors to be the single most important feature for effective learning. Studies show that simulations must be carefully crafted to include instructional features, guided experiences, performance measurement, diagnostic feedback, and a relevant match to the environment being simulated (Salas & Burke, 2002).

2.3 Monitoring and evaluation of the skills lab-based training in clinical clerkship

In education, the term assessment refers to the wide variety of methods that educators use to evaluate, measure, and document the academic readiness, learning progress, and skill acquisition of students from preschool through college and adulthood (Kizlik, 2011). Studies show that practical as well as theoretical assessments should be a mandatory requirement of medical courses (Denton, 2005).At the UIAHMS, OPM students are subjected to both formative and summative assessments in order to measure the level of acquisition in cognitive, psychomotor and affective skills. Level of competence acquired during skills lab-based training are assessed by conducting Objective structured clinical examination (OSCE) and objective structured practical examination (OSPE).

Practicing self and peer evaluation in small groups give students responsibility and support. Observing includes reflective practice and discussions between tutors and students. The ability to think critically, reflect, repeat performance and solve problems can aid students in becoming more proficient and allow them to increase understanding and insight (Dochy, Segers, & Sluijsmans, 1999).

Several studies on the validity and outcomes of simulated learning have reported satisfactory findings, such that simulations are at least as valid and effective as traditional methods for teaching, learning, and assessment (Kundhal & Grantcharov, 2009). In general, literature seems to suggest student satisfaction with the realism and outcomes of simulated experiences (Cant & Cooper, 2010). Teaching relevant skills to medical students in clinical skills lab is highly effective and cost effective (De Kock, 2014; Hao, 2002).Researchers have reported increased short term knowledge and greater learner satisfaction with simulations as compared to textbook-based learning activities (Lo et al., 2011).

It is reported that simulation without examination or interrogation results in no improvement in non-technical skills and that either oral or videotape-assisted feedback results in significant improvement (Reed, Andrews, & Ravert, 2013).Currently medical education in developed and developing countries conduct Observed Structured Clinical Examinations (OSCEs) as a way to ensure ability of clinical skills before starting clinical practice in a hospital. This section reveals that simulation is still very much a learning tool that can be used to develop and assess skills of learners although it has not yet progressed into an organizational improvement tool. Simulation based medical education is also effective for integration of clinical medicine and basic medicine (Okuda et al., 2009).
In their discussions of medical simulations,(Huang, Reynolds, & Candler, 2007), highlight the opportunity of assessment as the major advantage for medical simulation: they note in particular the potential for capturing behaviors in contexts similar to actual practice. They see distinct advantages in the fact that the setting is reproducible and that simulation allows measurement of skills such as communication and professionalism, which are otherwise difficult to evaluate.

Furthermore, Huang et.al, (2007) suggest the following positive features for simulations: fostering team-based approaches and opportunities for longitudinal monitoring; providing a platform for standardized education and assessment of learners; promoting uniformity of curricula; helping to develop critical thinking; promoting patient safety; ensuring exposure to both rare and common events; promoting task repetition for performance improvement; potentially accelerating acquisition of expertise over time; allowing assessment of psychomotor and interpersonal skills and providing opportunity for structured reflection through examination.

For quality assurance of learning outcomes, formal curricula are developed, implemented, and evaluated in a school environment where training or education plans are executed. Learners' competences depend on how they interact among themselves, with learning aids available, quality of trainers, teaching or working methods, tasks assigned with the guidance of the content (Soffer & Wand, 2004). However, the inability of participants to reach a consensus in a timely manner during the monitoring and evaluation phase can result in an incomplete project. In this case data analysis and conclusions are based on incomplete evidence whereby a handful participants are responsible for the production of the final report (Chambers, 1994).

CHAPTER THREE: METHODOLOGY

3.0 Introduction

This chapter presents information on research methods or practices of data collection and analysis that was used in the study while undertaking the participatory planned interventions to solve the problem. It outlines the research design, study area, study population, sample size and selection, procedure of sampling technique, data collection instruments, pre-testing (validity and reliability) procedure of data collection and analysis.

3.1 Research Design

The study employed a participatory qualitative action research design guided by the FW model to collect in-depth primary qualitative information from stakeholders. Both descriptive and comparative analyses were done while undertaking the participatory planned interventions to solve the identified problem. Descriptive analyses involved surveys and various fact finding enquiries while comparative analysis involved the use of pre-posttest evaluation. Secondary qualitative data was collected during document and work process analyses in the preliminary phase of FW. The quantitative part of the study relied on using quantitative measuring tools including an observation checklist, questionnaire and an instructional skills level assessment scale to identify training needs in clinical clerkship among OPM students. Babbie agrees with Newman (2006) that the best study design uses more than one research method, taking advantage of their different strength (Babbie, 2007; Kohlbacher, 2006).

3.2 Study Population

The study population comprised of stakeholders from Mulago hospital, UIAHMS and the School of Orthopedic Medicine (OPM). Only stakeholders who were concerned and interested in addressing the declining students' clinical clerkship competence were purposively included in the study. These involved two Orthopaedic Surgeons/lecturers, nine senior orthopaedic officers each purposively selected from a different unit, ward matron, two parents, three ICT specialists and the following individuals from UIAHMS: Deputy Principal, Dean of students, Academic Registrar, two Principal Tutors, and forty two students in their final third year of study (adding up to 64). The third year students were selected because they were assumed to have acquired enough knowledge in basic sciences that was a

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prerequisite for clinical clerkship training. This population represented employers of OPM graduates, faculty staff, Institute Administration, OPM students, practicing Orthopaedic Officers in the world of work and the community. It was presumed to be diverse and accessible to the researcher as well as knowledgeable about the topic being investigated.

3.3 Ethical issues in data collection

From the initial stage of this research project, the researcher was introduced to the Principal UIAHMS Mulago in writing by the Graduate School, Kyambogo University. The Principal granted the researcher a permission to conduct the research at OPM School. During FW plenary session, participants voluntarily contributed and felt obliged to take part in this research work. The researcher's role was to facilitate the discussion proceedings. The study being participatory in nature, all human participants were treated as collaborators rather than subjects. At the core of the participatory action research (PAR) method were principles agreed upon and these included democracy and humanity within research, which involved respect for persons participating in the research; a duty of care to vulnerable participants; an effort to limit risk and maximise participants' collective and individual benefits; opportunities for self-representation; ongoing responsiveness to the needs of the research partners; frequent review by those who were involved in the implementation of research action points; continuous reflection about potential ethical dilemmas by the academic researcher; and mutuality.

3.3.1 Informed consent

Although obtaining informed consent is a central element of social research, PAR work posed specific problems with respect to informed consent. As such informed consent in detail was not possible, because PAR research unfolds in a negotiated manner, it was difficult to communicate to participants in advance what they were going to experience and, hence, what they were consenting to (or for how long). It was therefore more appropriate to do a form of discussed consent, in which research partners, after a period of dialogue and concession, agreed to a set of rules around participation that all research partners were to adhere to within that particular phase of the research. It was found appropriate to provide an accounting of this consensus agreement in the form of group record of FW meetings rather than individual consent forms.

3.3.2 Anonymity and confidentiality

As with informed consent, guaranteeing anonymity and confidentiality was not always possible in this study. This was partly due to the group nature of the work. Because of the ways that this study underwent discussion among group members, others within the group were made aware of exactly who was participating in any particular instance; it was essentially public form of research in some respects. As a result confidentiality was looked at as situational, and was discussed from situation to situation.The interview process, reflective meetings and presentation of the participants in this cyclic action research was conducted in free and open-minded manner. Some willing participants were given the option of anonymizing their responses. Permission was also obtained for audio-visual recording and photography.

3.3.3 Data storage and access

In 'traditional' research data are held by the researcher and kept secure. This may not be the most appropriate or most equitable way to proceed in PAR work. Data ownership and storage both during the research process and after the project had reached its conclusion was discussed and agreed by the group in a consensual manner.

3.4 Data Collection Methods and Instruments used

The best data were collected basing on their relevancy to the research topic and their ability to provide pertinent answers to the research using various research methods that involved Focus Group Discussions (FGD), observation, photography, readily available data and reflection interview.Tools used include checklists, questionnaire, pre-posttest evaluations, reflection interview guides, camera, pen, and journal. A combination of such instruments was used in sequence as complementary approaches to the research question.Ideas about the implementation of the intended interventions were generated and discussed in regard to how they could be realised as action research involves the engagement of stakeholders in problem solving to ensure implementation of the suggested solutions (Billett et al., 2012).Ultimately, in-depth analysis related to the central issue being studied in addition to saving time and funds was realized.

3.4.1 Document Review

Secondary data in form of documents that contained important information related to the area of study were analyzed (as already explained in the early chapter of this report during situational analysis). This was done to get secondary data (readily available data) from which the researcher extracted information he presented to the stakeholders during FW session to enable the stakeholders make informed decision. By doing this the researcher was able to get the perception and opinions of the OPM school stakeholders with respect to improving training OPM students in clinical clerkship competence.

3.4.2 Focus Group Discussion

Small groups of eight people were purposive selected to assess and discuss specific emerging needs, develop interventions and test new ideas. It was believed that small group work would increase higher-order thinking skills and a higher ability to reason (Berk & Winsler, 1995). Focus group discussions were very instrumental while gathering primary data during the FW held at Mulago on 26th November 2016, and during the third reflection meeting on emerging issues out of the interventions implemented held on 3rd August held at the school of OPM's skills lab, Mulago. The information collected was used to formulate strategies to address and improve the existing situation. The purpose of the focus-group discussions was to give participants a chance to consider and build on what individuals in the group said about the issues raised.

3.4.3 Observation

Since action research aims at promoting change, a record of the situation before, whilst and after the change was done and kept in recorded form in a journal. Participatory observation offered the researcher an opportunity to gather live data from a naturally occurring social situation. Observational data collection technique was used to collect data on evidence of teaching methods, assessment methods, availability of skills laboratory resources, and suitability of practicum sites. Observation was also very instrumental in measuring the performance of students while at their practicum sites (orthopaedic practice I and II), see appendix VI. Clinical instructors and preceptors used the observation checklist provided by the OPM School (Appendix VII) to rate the students under their supervision using a 5-point Likert scale. Students were monitored, observed and rated as they practiced clinical clerkship on real patients during their clinical rotations.

3.4.4 Interviews

This technique was helpful in collecting information as the researcher dialogued directly with team players while in the field where the OPM students were attached. Interviews were an important part of the project as they provided the researcher with the opportunity to investigate further, to solve emerging problems and to gather data which could not have been obtained in other ways (Thoresen, 2001). A reflection interview guide was developed by stakeholders facilitated by the researcher and it helped the interviewer to focus the interview without imposing too much structure (Hill et al. 1997).

Although the interviewer had a list of themes or open ended questions that were to be covered (Appendix VIII),the interview guiding questions were converted to structured self-administered questionnaire due the nature of the hospital work that did not allow the team players an ample time to attend the interview session. The team players expressed their views in their responses with the help of the user-friendly structured questionnaire which allowed them some freedom to respond at the questions at their convenience.

3.4.5 Photography

Researcher-generated images are widely used as 'visual records' or as 'a visual diary'(Posser, 1998). Informed consent was obtained from voluntary participants before taking pictures. Photography was assumed to have the ability to perform a more multifaceted role in this study. The tools used in photography such as the camera, audio-visual devices provided multifaceted information about the students and about their interaction with the available resources in skills lab during training, as evidence to validate the research data. This served the role of stimulating discussions and of encouraging the participation in reflective thinking and as an aide-memoir. Various forms of photography were used while collecting data to evidence emerging and existing phenomena which later on was used for interpreting, and validating qualitative inquiry (Skrzypiec, Harvey-Murray, & Krieg, 2013).

3.4.6 Reflection

Reflection being the most important element in action research cycle, team players reflectively discussed the progress of the carefully planned and assigned duties as per action plan made during FW session. Information on their beliefs and perception on how effective the proposed changes were; what the emerging issues to learn from, barriers to change and

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how these changes could be improved to make a better future was obtained. Critical reflection took place both in isolation and within small group discussions where ideas and impressions were shared. Changes in attitude and practice in those concerned with the interventions to improve on clinical clerkship competence were emphasized (Kemmis, 1990). Energized by dialogue, practitioners entered into reflective conversations about practice problems in which they made their reasoning explicit. Reflective practitioners explored their thinking through dialogue (Schön, 1983).

3.5 Validity and Reliability

3.5.1 Validity

Many qualitative researchers have developed their own concepts of validity and have often generated or adopted what they consider to be more appropriate terms, such as, quality, rigor and trustworthiness (Davies & Dodd, 2002; Lincoln & Guba, 1985; Mishler, 2000; Seale, 1999; Stenbacka, 2001).

The validity of the analysis was assessed throughout the study from the start to conclusion of the study. To accomplish this, a constructively skeptical process of independent auditing was observed. In addition, other useful validation strategies were employed specifically validation by research participants that involved presenting the results to the original informants. Feedback obtained was used to make corrections. The other` strategy used was triangulation which involved comparing data collected by different methods such as photography, observation, questionnaire and interview. Triangulation method of data collected involved using different tools from different sources aiming at achieving the same objectives.

3.5.2 Reliability

This relates to the concept of a good quality research. Whereas reliability is a concept to evaluate quality in quantitative study with a purpose of explaining, quality concept in qualitative study has the purpose of generating understanding(Stenbacka, 2001)

While the terms reliability and validity are essential criterion for quality in quantitative paradigms, in qualitative paradigms the terms credibility, neutrality or confirm-ability, consistency or dependability and applicability or transferability are considered to be the essential criteria for quality(Lincoln, Lynham, & Guba, 2011).

The researcher logically documented data gathered from group dialogues with students, tutors, surgeons and other hospital staff, and also from personal logs and field notes ensuring its consistency and dependability to the study (Loh, 2013). A broader concept of consistency was considered as the degree to which a method investigates what it is intended to investigate (Brinkmann, 2008).Reliability and validity were conceptualized as trustworthiness, rigor and quality in qualitative paradigm.

One merit associated with triangulation (mixed) approach is that it tested the consistency of the findings obtained through different instruments that included interview guide, observation, photography, FGD and the journal. Triangulation increased chances to control or at least assess some of the indulgences or multiple causes influencing our results (Patton, 2001) and became a device for enhancing the credibility and persuasiveness of a research account (Bryan, 2002).

3.6 Procedure for data collection

After proposal approval, the researcher was allowed by the Kyambogo University Graduate School to conduct the research. Because the administration of UAIHMS had earlier on allowed the researcher to use her facility for future workshops and school of Orthopaedics for his study, there was no need to obtain another permission.

Forty two students who voluntarily participated in the study were given a pre-test to assess their current abilities in clinical care of an orthopaedic patient. This was followed by a clinical teaching on how to obtain data from a patient, carry out physical examination, investigate the patient, and how to use this cumulated information to make diagnosis and treatment plan. Students were randomly paired for the purpose of one acting as a simulating patient for each other in turns. Study guides with manoeuvres done to make an orthopaedic diagnosis were given to students to guide them carry out clinical clerkship in a simulated environment. After this exercise, students were sent for one month practice on real patients during their rotations in different hospital departments.

While at the practicum sites, each student practiced under the supervision of a preceptor and a clinical instructor who were served with observation check- list designed by stakeholders during the FW session. Using this tool, students were evaluated using a 5-point Likert scale (Appendix VI). At the end of the exercise known as orthopaedic practice, results were submitted to the school of OPM for compiling and analysis. The preceptor and the

clinical instructor independently monitored, observed and documented each students' level of acquisition of technical and humanistic skills to avoid biasness and hallo-effect (Mirghani & Elsanousi, 2009). The researcher worked in collaboration with the faculty team to gather, compile and analyse the results.

3.7 Data analysis and Dissemination of Results

3.7.1 Qualitative analysis

The study was essentially qualitative in nature and employed phenomenological qualitative technique of data analysis (Biggerstaff & Thompson, 2008). This technique involved transcription of data from the field, validation, coding and categorizing presentation and interpretation based on field notes, observations, participants' reflection and discussions. The findings from the field, discussions and group reflection were read and re-read several times to ascertain the similarities and differences in order to find themes and code categories in the study. The ideas from the qualitative data were coded according to the themes in the study later to be used to illustrate the qualitative findings during data presentation, discussion and drawing conclusion.

3.7.2 Transcription of data

In this step, the researcher logically documented data gathered from group dialogues with hospital staff, students and tutors, from interviews with tutors and the Institute administration, physicians, and also from personal journals, observations and field notes following the objectives of this study.

3.7.3 Coding and categorizing

Data collected for this study was coded in themes for analysis based on the objectives and research questions of this study. This process of coding helped the researcher to identify relevant and appropriate information for this study in a condensed manner. However it should be noted that it was disadvantageous in that it reduced the richness of the data gathered in the process since this condensation of data was subjected to the researcher's selectivity of ideas which could have led to some information being left out.

3.7. 4 Interpretation and drawing of conclusions

The interpretation of the results of the study was based on the team players' reflections and observations of the situation that they managed to capture during the study period as it unfolded, and their perception of whatever transpired in the study situation. Mikkelsen observes that there are many challenges in the interpretation and drawing conclusions of qualitative data in a sense that there are no absolute rules to govern it except the researcher has to do the very best with his or her intellect to fairly represent the data and communicate what the data reveal given the purpose of the study (Mikkelsen, 2005). Thus it required that the researcher be closely involved in the process from conceptualization to the presentation of the results. Thus the team players' reflections and interpretations of the results of this study were based on their experiences of the whole research process; based on what they had observed, heard and did.

The interpretation and discussion of the results were enhanced by the scholarly views, theories and concepts that the researcher had read from various literature sources some of which had been documented in chapter two of this report. The researcher always promised the participants due confidentiality that their views would be held secret and their identities protected throughout this study. The researcher tried to make his intentions and actions explicit through dialogues with the stakeholders and also tried to observe independent values throughout the process. This is supported by Winter (1996) cited by Denscombe, where he points out that when dealing with action research, the work must remain visible and open to suggestions, permission must be obtained before making observations and that the researcher must accept responsibility for maintaining confidentiality (Denscombe, 2007).

3.8 Dissemination of Results

Study findings will be presentation at conferences, workshops, publication in peer reviewed journals.

CHAPTER FOUR: ACTION IMPLEMENTATION AND EVALUATION PRESENTATION, ANALYSIS AND INTERPRETATION OF RESULTS

4.0 Introduction

This chapter presents the results from interventions implemented and their evaluation based on the study objectives and plan of actions drawn by the school of OPM stakeholders (Table 4.1 below).An account of who did what, when, where, how and why is narrated. The study was set out to enhance skills lab-based training of OPM students in clinical clerkship competence by utilizing the available skills lab resources. Competence acquisition was measured using observational checklists, pre-post skills lab-based training performance scores and reflection data collection guide as tools using a 5-point Likert scale. Students were observed during their routine rotations at different practicum sites each rated by two supervisors (clinical instructor and a preceptor). The researcher gathered data from the observation checklists, reflection guide and field notes from stakeholders at practicum sites. Future Workshop instruments were used to collect, collate, and analyse experiences, views, and perceptions from stakeholders of School of OPM in relation to the study objectives. Findings and outcomes were compiled and evaluated and are presented in tables and percentages.

Participation in the study was voluntary involving sixty four stakeholders of the School of Orthopaedic Medicine. Forty two(65.6%) of these were year three students, two (3.1%) orthopaedic surgeons/lecturers, three (4.7%) administrators, two(3.1%) principal tutors, nine (14.1%) senior orthopaedic officers, one(1.6 %) ward matron, two(3.1%) parents, and three (4.7%) information and communication technology specialists. Nineteen (29.7 %) of the stakeholders were identified as voluntary team players who participated in the implementation of the assigned tasks to ensure that the research questions get the intended answers. Therefore the study findings are arranged in three subthemes according to the study objectives which include: a) to establish a functional skills lab by utilizing the available resources; b) to implement interventions to enhance skills lab-based training in the clinical clerkship competence; and c) to evaluate the outcomes of the implemented interventions so as to enhance skills lab-based training in clinical clerkship competence among OPM students at Mulago.

Table 4.1: Action Plan for Participatory Implementable Interventions

(Number of voluntary team players/responsible persons in brackets)

Activities	Responsible person (s)	Time frame
Designing clerkship curriculum; study objectives, study guides	Faculty Team (6)	1 month
Purchasing clerkship curriculum materials like dummies, (mannequins, models), DVDS, animated diagrammatic representations,	Institute Principal, Bursar, Principal Tutor OPM School (3)	4 months
Inventory and organization of available skills lab resources	Faculty team, Students (12)	2 weeks
Purchasing ward equipment and surgical instruments	Principal Tutor (OPM), Administration (4)	4 Months
Supplying consumables (sundries)	Principal Tutor OPM School, Institute Bursar (2)	1 Month
Allocating adequate time for rotations in specialized units and skills lab	Faculty team, Students (12)	1 Month
Designing clerkship evaluation and grading system (Tools)	Researcher, ICT team (4)	4 Months
Appointing Clerkship Coordinators and skills lab technicians, appointing and training of Clinical Instructors.	Institute Principal, Principal Tutor, Bursar (3)	1 Month

Source: Future Workshop Plenary session

The table 4.1 above represents the action points that were to be implemented by 19/64 (29.7%) team players. The team included 6/19 (31.6%) faculty team members, 6/19 (31.6%) students, 3/19 (15.8%) administrators, 3/19 (15.8%) ICT specialists and 1/19 (5.2%) researcher.

4.1 Resources identified and organized to establish a functional skills lab.

4.1.1 Skills lab curriculum materials

During the plenary session held on 26th November 2015, stakeholders expressed their concern about the inability of OPM students to clerk patients proficiently despite the presence of a skills lab. Stakeholders came up with a theme whose objective was to establish a functional skills lab where students can interact with the available skills lab resources and amongst themselves as simulators before interacting with actual patients. During the meeting, School of OPM stakeholders focused on curriculum resources that were essential for establishing a functional skills lab and were within in the range the Institute could afford to provide (see Table 3 above).

During the implementation of the study, the researcher used participatory action plan checklist of targeted essential skills lab resources in comparison with the existing inventory list (Figures 4.4-4.6 below) to measure failure and success rates of the interventions done.

Figure 4.4: An assortment of existing skills lab resources organized for training OPM students ***(Photo by OPM Stakeholder, April 26, 2016)***

Figure 4.5: Skills lab resources for learning anatomy

Figure 4.6: X-Ray viewing Box in use

(Photos by researcher, April 26, 2016)

Description of the list of existing skills lab resources in comparison with the one drawn by stakeholders during the FW session was reflectively done to give an account of the effectiveness of the treatment. Findings were tabulated for descriptive analysis as shown in table 4.2 below:

Table 4.2: Checklist of available skills lab resources

SN	Skills lab resource Identified during FW Session	Existing resources before the study	Number of resources targeted	Existing resources after the study	Success Rate	Failure Rate
1	Clerkship syllabus	0	1	1	1 (100%)	0
2	Study objectives	25	46	38	13 (28.3%)	8 (17.4%)
3	Study guides	0	8	8	(100%)	0
4	Mannequins	0	5	0	0	5 (100%)
5	Models	0	5	0	0	5 (100%)
7	Ward equipment and surgical instruments (in sets)	2	10	2	0	10 (100%)
8	Consumables	7	20	10	50%	10 (50%)
9	Appointment of Clerkship coordinator	0	2	0	0	2 (100%)
10	Appointment/training of Clinical Instructors	1	7	3	2 (28.6%)	4 (57%)
11	Clerkship evaluation and grading software	0	14	11	11 (78.6%)	3 (27%)
12	Skills lab technician	0	2	0	0	2 (100%)
13	Time for Practice	2 hours (0.95%)	3 days a week	1 day per week	7 hours (33.3%)	14 hours (66.7 %)

Source: Secondary data from document review checklist

Results from the table 4.2 above shows that the targeted number of clerkship syllabus and study guides as skills lab resources were realized, 11/14 (78.6%) of clerkship evaluation and grading software tools were evaluated and approved, half the required number of consumables (boxes of plaster of Paris (POP), examination gloves, buckets, gauze wires for traction, surgical blades, cotton wool and gauze rolls) were supplied. Only two sets of surgical instruments were created from the already available assortment of instruments. The procurement of mannequins, models, ward equipment and surgical instruments was not effected. No appointment of clerkship coordinator or skills lab technician was done.

Table 4.3: Team players' opinion on use of available skills lab resources

SN	Statement	Agree n (%)	Disagree n (%)	Undecided
	What didn't quite go to plan?			
1	Purchase of dummies,	7 (58.3 %)	2 (16.7%)	3 (25)%
2	Purchase of DVDs, Audiovisual recorder, Animated Diagrammatic presentations	5 (41.7%)	1 (8.3%)	6 (50%)
3	Purchase of surgical and ward equipment	8 (66.7%)	1(8.7%)	3(25%
4	Purchase of sundries (consumables)	5 (41.7%)	5 (41.7%)	2 (16.6%)
5	Preparation of study Guides	3 (25%)	2 (16.7%)	7 (58.3%)
6	Preparation of Clerkship curriculum, objectives, Time table	5 (41.7%)	4 (33.3%)	3 (25%)
7	Appointment of Clerkship Coordinator	6 (50%)	5(41.7%)	1 (8.3%)
8	Appointment and training of Clinical Instructors	7 (58.4%)	3 (25%)	2 (16.6%)
9	Appointment of Skills Lab Attendant	7 (58.7%)	4 (33.3%)	1 (8.3%)
	Why action plan did not go as planned?			
10	Lack of funds	11(91.7%)	0 (0%)	1 (8.3%)
11	Un interested expert at practicum sites	8 (66.7%)	1(8.7%)	3 (25%)
12	Un availability of requested materials on local market	9 (75%)	2 (16.7%)	1 (8.3%)

Source: Reflection interview guide

Twelve questions were used to explore the opinions of the team players on the use of available resources in the skills lab to enhance students training in the clinical clerkship competence as shown in table 4.3 above. Under question 1-9, team players were asked what never went according to plan and questions 10-12 were about the key factors that were responsible for this. Eight team players(8/12,66.7 %) believed that purchase of surgical and ward equipment did not go quite well as per action plan, while 7/12 (58.3%) believed that purchase of dummies, lack of appointment and training of clinical instructors, and of skills lab technicians did not go quite well as was planned.

Out of the twelve team players, 11/12 (91.7%) believed that lack of funds was the key factor that was responsible for action plan not being implemented as was planned, 9/12 (75%) believed that unavailability of the requested materials on local market was the main reason while 8/12 (66.7) thought that it was due to uninterested experts at practicum sites. Three

administrators interviewed revealed that lack of funds was not the reason why the action points were not done as per the plan.

4.1.2 Reflection on emerging issues

Team players reflected on the time table and found out that allocated time of2/35 (5.7%) hours weekly to students for practice was found to be inadequate. At the UIAHMS, there are seven working hours in a day (35 working hours in a week), one hour for break and one hour for lunch. Team players noted that lack of enough time for practice was making the OPM students become more theoretically than practically trained. The time table was adjusted so that students could access the skills lab at least one day in a week where clinical instructors could guide them. The time allocated to practice in the skills lab was increased from 2/35 (5.7%) to 7/35 (20%) working hours a week. When four students were randomly asked to comment on the current status of the skills lab, all of them reasoned that skills lab was very ill equipped, clinical teachers in the skills laboratory were very few and time allowed to interact with available skills laboratory resources was very limited.

4.1.3 Future Workshop on Evaluation and Grading Software System

The second meeting held on 26th April 2016 was attended by key stakeholders which included a senior lecturer from College of Health Sciences, Makerere University, UIAHMS and OPM school administrators and students representatives, see figures 7 and 8 below:

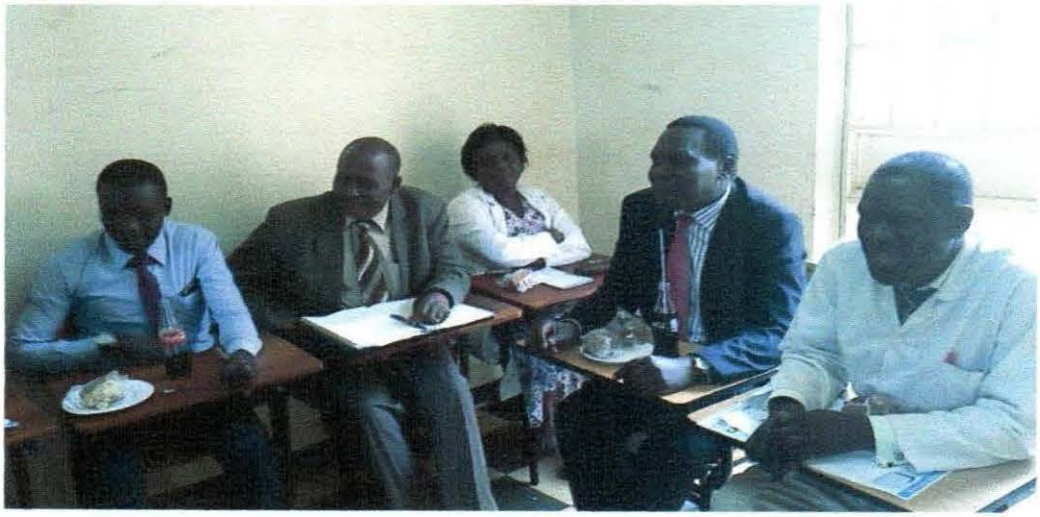

Figure 4.7: The Institute Administration in attendance during the 2nd FW meeting at UIAHMS-Mulago,

(Photo by the researcher, April 26, 2016)

In the figure 4.7 above are some of the stakeholders discussing a template of detailed proposed evaluation and grading software system comprising of 14 tools (Appendix IX).Guided by the FW approach of action research design, stakeholders examined each tool at a time, making necessary improvements that were deemed essential for the institute in general and OPM school in particular. Specific software tools were to be designed for easy access by responsible stakeholders electronically for purposes of effective monitoring and evaluation of learners as well as giving them timely feedback. Out of all the tools presented to the FW session, 11/14 (78.6%) were approved. The system is currently ready for use but still awaits launching. Two (18.2%) hard copies of these tools are already in use (Appendix VI and VII). One of the senior tutor's interviewed to comment on the tools said, "I think giving students the opportunity to evaluate their teachers may bring about conflict of interests".

Figure 4.8: A second FW meeting discussing the relevance and validity of the evaluation and grading system software in skills lab at Mulago

(Photo by one of the stakeholder, April 26, 2016).

A senior Lecturer (personal communication, April 26, 2016) of Makerere University Medical School who attended the FW made his remarks: "I highly commended the researcher's innovative approach to solving the long standing problem of incompetence in the overall clinical care of patients among students of school of OPM.

Figure 4.9: Stakeholders in the established skills lab
(Photo by a team player, April 26, 2016)

4.1.4 Focus Group Discussion on the Skills lab Human resource Development

Figure 4.10 below shows the third meeting that was held on 3rd August 2016 in the skills lab. A participant identified a Non-Governmental Organization (NGO) willing to meet the training costs of more clinical instructors. The said organization donated a new LCD projector which has significantly motivated learners to share information and practical experiences while in the skills lab.

Figure 4.10: Third meeting with stakeholders on OPM Human Resource Development and Motivation held at the school of OPM skills lab Mulago

(Photo by researcher, August 3, 2016).

In view of the high expenses needed to keep the skills lab functioning, the meeting came up with the concept of starting a project to manufacture Plaster of Paris as a means to sustain a functional skills lab. The project will boost casting techeniques and attract revenue for self sustainiabilty and motivate the clinical instructors. "I wish you could come up with a concept paper for this proposed project before I meet the sponsor next week !" Brian (personal communication August 3,2016) the coordinator of the prospective funding Organization observed (see figure 4.10 above). Funds to sponsor 1/7 (14.3%) of the clinical instructors for a 3 months study tour to United Kingdom effective december 2016 were realized. The meeting noted that the governing council had ran an advertisement for support staffs including lab technicians.

4.2 Interventions implemented to enhance skills lab-based training.

4.2.1 Needs Assessment

Table 4.4 below shows the results of the pre-test on skills level self-assessment. Students voluntarily participated in this skills level self-assessment using the Pre-clinical clerkship Skills Level Assessment tool (Appendix IV).Students were asked to indicate at which level they believed at the time they could perform the given skills on a patient. The skills Level self-assessment exercise helped the learners to identify their knowledge gaps and training needs. This pre- test on the skills level self-assessment in making an orthopaedic diagnosis was measured using a "can perform" and "cannot perform"5-point Likert scale which was later on collapsed into two-point scale for easy interpretation and analysis as shown below:

Table 4.4: Students' pre-test on skills level self- assessment (needs assessment)

Serial number	Level of skills (Needs) Assessment			
	Self-assessment in diagnosing:	Number of manoeuvres	Cannot perform them	Can perform them
1	Ankle Pain	8	28 (61.9%)	14 (33.3%)
2	Elbow Pain	10	26(61.9%)	16 (38.1%)
3	Foot pain	2	38 (90.5%)	4 (9.5%)
4	Knee pain	13	36 (85.7%)	6 (14.3%)
5	Low back, and shooting leg pain	26	35 (83.3 %)	7 (16.7%)
6	Neck and shooting Arm pain	13	37 (88.1%)	5 (11.9%)
7	Shoulder pain	19	37 (88.1%)	5 (11.9%)
8	Wrist and hand pain	11	37 (88.1%)	5 (11.9%)

Source: Secondary data from document review

The study revealed that on average more than 35/42 (83.3%) students could not assess pain in the foot, neck, shoulder, knee, wrist and hand whereas less than 6/42 (14.3%) of them could carry out manoeuvres to assess pain of the same joints (Table 6 above). A substantial number of students 14/42 (33.3%) could assess ankle pain using all the eight maneuvers while 16/42 (38.1%) were skilful in using all the ten manoeuvres needed to carry out the assessment of the elbow joint.

4.2.2 Simulation

Figures 4.11 below shows the OPM students being randomly grouped into twos (dyad) for the purpose of role playing as simulators for each other. In figure 4.12, the students were receiving study guides to help them orient in carrying out physical examination of an orthopaedic patient with a painful joint.

Figure 4.11: Random pairing of students
(Photos by researcher, May 11, 2016)

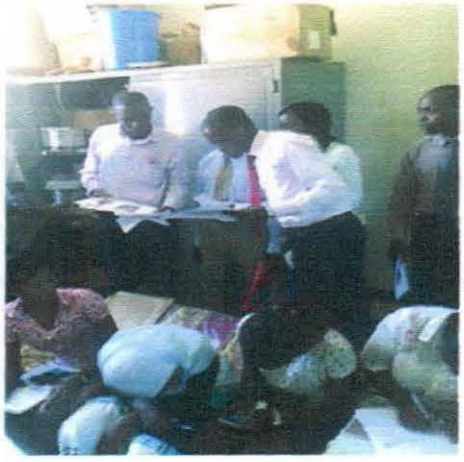

Figure 4.12: Students receiving Study Guides
(Photo by a team player, May 11, 2016)

Figure 4.13 below shows OPM students in the established skills lab treating a patient as part of clinical clerkship training process. Using the knowledge got from the study guides, each pair of students demonstrated to the rest of the group how to perform a skill tasked followed by peer evaluation under the guidance of the clinical instructor.

Figure 4.13: Simulation in practice: POP casting practice
(Photo by the researcher, Ma ` `y 17th 2016)

One of the students was heard making a comment: "It is very unfortunate for us the finalists who are meeting these educative guides at the close of our program".

After relating to 5/8 (62.5%) of the study guides in skills lab, students were sent to hospital practice on actual patients for a period of four weeks. Each student was observed by a clinical instructor and a preceptor independently using an observational checklist (Appendix VI). Scores obtained by each student were sent to the school of OPM for compilation and analysis. The average overall score from all rotations were documented as orthopaedic practice II.

4.2.2 The role of specialized unit professionals as Human Resource

Senior Orthopaedic Officers who volunteered as team players were asked to give their views on the process of training OPM students in clinical clerkship competence as they rotated in their places of work. Tabulated below (Table 4.5) are some of their key observations.

Table 4.5: Team players' opinion on their involvement as human resources available for the skills lab-based training of OPM students in clerkship competence

SN	Statement	Agree	Disagree	Undecided
1	Stakeholders' participation in skills lab based training has improved OPM students in clinical clerkship competence.	11/12(91.7%)	0	1/12 (8.3%)
2	I think my involvement in training OPM students on job has been among my successful element of my routine work over the last semester.	12/12(100%)	0	0
	The key attributes in this success has been:			
3	Bed side teaching,	9 (75%)	1(8.3%)	2 (16.7%)
4	Imparting skills through hands-on practice	12(100%)	0(0%)	0
5	Demonstrations and return demonstrations,	11(91.7%)	1(8.3%)	0
6	Observation, while assisting during procedural tasks	12(100%)	0(0%)	0
7	Pre-skills lab clinical teaching,	10(83.3%)	2(16.7)	0
8	Case studies and case presentation	6 (50%)	3 (25%)	3 (25%)
9	Assigning projects	5(41.7%)	6 (50%)	1 (8.3%)
10	As a stakeholder I contributed to bring about a change for improvement in the process of implementing the assigned task	11(91.7%)	0(0%)	1 (8.3%)
8	Participating in skilling OPM students has been a life changing experience and I am encouraged to interface with learners in a different way from the past.	10(83.3%)	1(8.3%)	1 (8.3%)
9	I can now support training in clinical clerkship skills acquisition using the available resources around me.	12 (100%)	0(0%)	0

Source: Reflection interview guide

All the twelve key team players believed that their involvement in training OPM students during the previous semester contributed to the enhancement of the clinical clerkship skills among students. They also believed that key elements in this success involved the experts' guidance and observations on students as they assisted them (experts) during procedural tasks, stakeholders' desire to bring about a change for improvement in the process of training learners and their commitment to support training OPM students in clinical clerkship skills acquisition using the available resources at their place of work.Of all the team players 11/12(91.7%) were convinced that their participation in skills lab-based training improved OPM students in clinical clerkship competence, and the key attribute was their contribution to bring about a change for improvement in the process of implementing the assigned task. A considerable number of them 10/12 (83.3 %) believed that stakeholders'

participation in pre-skills lab clinical teaching and their participation in skilling OPM students using different approaches improved training in clinical clerkship competence.

This success was attributed to demonstrations and return demonstrations, participatory involvement of stakeholders in skilling OPM as a motivational and life changing experience that encouraged friendly atmosphere to interface with learners done in a different way from the past. However, 9/12 (75 %) believed that the key factors in this success had been by bedside teaching and lecturing or traditional ways, whereas 5/12 (41.3 %) thought that it was through case studies and assigning students projects that brought about the success.

4.3 Monitoring and evaluation of the outcomes of the implemented interventions

Monitoring and evaluation of the implementation process of the interventions cited by stakeholders was carried out from the start to the end of the study. Tools used include inventory and observational checklists, pre-post-test, documents, journal field notes, camera, individual and group reflection interview guides, and a computer.

4.3.1 Overall scores from practicum sites rotations

At the end of the practicum sites rotations, scores for each student from each of the site allocated to rotate in were submitted to the school of OPM for compilation. An average score for each student was calculated from cumulated scores from various specialties students rotated in. The overall pre-post skills lab-based training scores in clinical clerkship were presented as orthopaedic practice I and II scores as tabulated below:

Table 4.6: Overall average scores from units' rotations of one-group Pre-Post skills lab-based training

Scale	Description	Percentages	Orthopaedic Practice I	Orthopaedic Practice II	Discrepancy
5	Outstanding	80-100 %	2	17	+15
4	Advanced	70-79%	5	7	-2
3	Proficient	60-69%	27	14	-13
2	Incomplete	50-59%	9	4	-5
1	Fail	Below 50%	None	1	+1

Source: Formative Assessment score sheets

In the above table 4.6,orthopaedic practice I reflects the scores OPM students attained after practicum sites rotation before they were exposed to skills lab-based training in clinical clerkship whereas orthopaedic practice II represents the scores the same group of students achieved after skills lab-based training in clinical clerkship.

During Orthopaedics practice I only one 1/42 (2.4%) student got an outstanding score, whose absolute performance was consistently outstanding, active, and self-directed learner.Of all the forty two students 27/42 (64.3%) were average within the range expected for OPM students whose progress was satisfactory. This group of students functioned and learned effectively in a variety of settings and met all clerkship requirements. Although none failed, 9/42 (21.4%) were incomplete meaning that these students had not completed all the required clerkship activities for unknown reasons. Such a grade was assigned to students who needed help before they could be allowed to progress with the rest.

Orthopaedic practice II scores were achieved after the same group of students were exposed to skills lab-based training in clinical clerkship. Performance considerably improved with 16/42 (38.1%) attaining an outstanding results, and there was a considerable decrease of students rated incomplete from 9/42 (21.4%) to 4/42 (9.5%) and a decrease in number of those rated as proficient from 27/42 (64.3%) to 14 (33.3%).

Table 4.7: Team players 'reflection on outcomes of the interventions implemented

SN	Statement	Agree	Disagree	Undecided
1	Development of Evaluation and Grading System (Tools) did not go quite according to plan	5/12 (41.7%)	5/12 (41.7%)	2 (16.6%)
2	The key factors about action points not done as planned include lack of follow up	8/12 (66.7%)	2/12 (16.7%)	2 (16.6%)
3	Timely Feedback from other stakeholders come with key messages that have helped me to improve my service delivery to the school.	8/12 (66.7%)	2/12 (16.7%)	2 (16.6%)
4	Regular group reflection on the overall progress of the project would quicken the realization of the desired change or success story/leaving theory.	12/12 (100%)	0	0

Source: Reflection interview guide

All the team players observed that regular group reflection on the overall progress of the project hastened the realization of the desired change or success story. In items 2 and 3 of the table 4.7 above, when the key stakeholders were asked to give their opinion on issues that did not go quite according to plan, 8/12 (66.7%) agreed that the key factors that stalled the action plan included lack of follow up of students by their tutors. However they observed that timely feedback from other stakeholders came with key messages that were helpful in improving their service delivery to the school of OPM. Whereas 5/12 (41.7%) respondents in item 1 agreed that development of an evaluation and grading software system (Tools) did not go according to plan, an equal number of respondents did not agree.

CHAPTERFIVE: DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

The study set out to improve training OPM students in clinical clerkship competence by utilizing the available skills lab resources at the School of Orthopaedic Medicine, Uganda Institute of Allied Health and Management Sciences, Mulago.

The first objective was to establish a functional skills lab by organizing and utilizing the available resources aimed at enhancing skills lab-based training in clinical clerkship competence among OPM students. The study found out that there was an assortment of skills lab resources that were not being efficiently utilized by students to improve their clinical clerkship skills. More clinical clerkship competence objectives were adopted, students accessed study guides that helped them carry out a number of joint pain assessments of an orthopaedic patient, and the UIAHMS administration supported OPM School with some supplies of consumables. Two of the stakeholders (Orthopaedic Officers) committed themselves to support the OPM School as clinical instructors while at their places of work.

However, some curriculum materials such as dummies, models, virtual-reality simulators, ward equipment, surgical instruments were not purchased. Limited time was allocated for practice, clerkship coordinator and skills lab technicians were not appointed as per action plan. When the team players were asked to give their views on skills lab resources, majority of them believed that purchase of surgical and ward equipment and of curriculum materials did not go quite well as per the action plan due to lack of funds.

The second objective was to implement the skills lab-based training interventions cited by the stakeholders during the FW session. The study found that the majority of students could not assess an orthopaedic patient with joint pains especially foot pain assessment.

The individual reflection survey revealed that the majority of the team players believed that their involvement in training OPM students contributed to the success of enhancing clinical clerkship competence. The key attributes for this success included imparting skills through guided hands-on practice, observing and guiding students as they assisted experts during procedural tasks, demonstrations and return demonstrations, stakeholders' commitment to support training OPM students in clinical clerkship skills using the available resources at

their place of work. Few believed that the traditional way of training brought about the success.

The third objective was to evaluate the outcomes of the implemented participatory interventions. It was established that one-group of OPM students performed better in orthopaedic practice II following lab-based training than in orthopaedic practice I which was done after traditional method of training. The pre-skills lab-based training score of the group following traditional method of training (orthopaedic practice I) disclosed that only one student got an outstanding score. The majority of students were average within the range expected for students who are progressing satisfactorily. Post- skills lab-based training results showed that performance improved with majority of students attaining an outstanding results, and a considerable decrease in number of students rated incomplete.At the conclusion of AR cycle all the team players opined that regular group reflection on the overall progress of the project hastened the realization of the desired change, some appreciated that timely feedback from other stakeholders came with vital messages that helped them to improve their service delivery to the school.

5.2.1 Establishment of a functional skills lab by utilizing the available resources

In this study stakeholders held high expectations of the skills lab as they perceived it to be similar to hospital environment in a school set up (Torkington, Smith, Rees, & Darzi, 2001). The established skills lab learning environment was perceived to be safe and comfortable setting for skills acquisition. Training in skills lab offered students a number of advantages such as skills training being in accordance with the syllabus covering all aspects associated with skills acquisition. Teachers in the skills lab were not interrupted by competing tasks associated with patient care. Learning was neither opportunistic nor limited in time and the environment was not as noisy as in wards. Use of peers as simulators compensated for patients not being available for specific procedural tasks which could have restricted teaching in real life experience (Nair, Coughlan, & Hensley, 1998).

Much as stakeholders' expectations of skills lab-based training were generally met, students did not get to practice each skill as much as they felt. Students did not attain as many clinical skills as was envisaged because the teaching sessions were short and, the skills lab was ill equipped and not open to students for self-directed learning and practice. Only 5/8 (62.5%) study guides were used and the identified available resources were for the most time

kept under key and lock due to lack of skills lab technician to keep the expensive skills lab resources secure. When asked about training characteristics during the FW meeting held on 3rd August 2016, students professed that the skills lab was very ill equipped, clinical teachers in the skills laboratory were very few and time allowed to relate theory with available skills laboratory resources was very limited. However, they observed that having in place a well-equipped skills laboratory, committed clinical instructors, adequate time to relate with skills lab resources and timely feedback would tremendously improve their clinical clerkship competence.

On the other hand, studies have shown that skills lab courses do not by themselves satisfy the students' need for skills practice (Lopez, 2000). This means that it is important to inform students that skills lab courses are supplements and not replacements for traditional method of clinical training. However, students should also understand that skills perfection take time and require repeated practice both in the skills lab and during clerkship on real patients (Love, McAdams, Patton, Jean Rankin, & Roberts, 1989).

The study furthermore showed that skills lab based-training helped students gain confidence in performing clinical practical skills just like was reported by Taylor et al. (Taylor, Vergidis, Lovasik, & Crockford, 1992).This was evidenced by improvement in orthopaedic practice as shown by the difference between formative assessment scores of orthopaedic practice I and II. During skills level self-assessment, the study found out that the majority of the traditionally trained students could not carry out most of clerkship techniques as a practice to assess various conditions of an orthopaedic patients .

As lack of confidence and anxiety among students pose challenges in medical education, skills lab-based training eased the phase of translating knowledge from the classroom to the real clinical world (Moss & McManus, 1992). In this study, the majority of stakeholders believed that skills taught in the skills lab using the available resources could be translated to patients. Although students also believed in transferability of skills, some still thought that traditional methods of training in clerkship would provide them with a better opportunity to learn basic clinical skills than the skills lab-based one. The study did not capture why some students preferred skills training in a traditional way of clerkship over skills training in the skills laboratory. Probably it could be that these students were over ambitious to interact with actual patients other than with dummies as soon as possible and found training through the skills lab as wastage of time.

5.2.2 Implementation of interventions to enhance training in clinical clerkship competence

The study findings of the skills level self-assessment established that the majority of students had never employed most of the manoeuvres in the guides provided to assess painful joints especially the foot. A noteworthy number of students believed that they could perform the manoeuvres if they were beforehand trained how to do so in a functional skills lab. This knowledge and skills gap identified implied that there was an obligation to devise means of imparting clerkship skills on OPM students to the extent of their satisfaction.

Exposing students to skills lab resources before they interfaced with actual patient improved attainment of not only clinical skills, but also equipment-handling skills, communication skills, history taking and physical examination and experience in integrating clinical teaching with theoretically taught basic sciences. Scholarly finding reveals that the trainees' basic medical skills program should be designed to support the intended learning outcomes and be integrated within the overall curriculum, including within the assessment strategy (Bradley & Postlethwaite, 2003).

History and physical examination were taught on peers as simulators. Random grouping of students into two (dyads) prompted enthusiasm in using the study guides provided and confidence in managing future patient encounters as compared to training alone. This approach concurs with a report done on the role of the instructor in a simulator learning environment as that of an organizer and facilitator (Ellington, 1985). Effective instructors don't teach so much as they facilitate learning. According to Chapnick and Chapnick (2009), students that regard effective teachers as those that are useful, helpful, and valuable, are more than those that regard effective teachers as knowledgeable or experts. This training format helped to maintain high-quality medical training in view of an increasing number of students enrolled for the OPM program. These results are consistent with existing literature on dyad training from domains outside medicine (Sanchez-Ku & Arthur, 2000)and are supported by theoretical assumptions regarding how and why collaborative learning works in terms of increased confidence, shared memory, and cognitive partnership (Topping, 2005). Literature from the field of motor skills learning, neuroscience, and psychology offers theoretical explanations of the observed benefits from dyad practice. However it should be noted that skills learned during a course decline if not maintained by practice (Van Dalen et al., 2002).

Majority of the team players believed that their involvement in training OPM students as they assigned students procedural tasks was among their successful approach. It was also believed that the key aspects in this success included imparting skills through guided hands-on procedural activities, observing students as they assisted experts during procedural tasks, demonstrations and return demonstrations. More so, stakeholders' desire to bring about change for improvement in the process of training learners on job was a key factor. Their commitment to supporting the training OPM students in clinical clerkship skills acquisition was fundamental. Few believed that bedside teaching, lecturing, case studies and assigning students projects brought about the success.

Without an evidence base for skills lab-based training, many experts in the world of work continue to teach as they were taught (Ironside, 2005) even though the context in which students learn and practice has changed, and continues to change, dramatically. However this does not rhyme withPeeraer et al. (2007) who observed that in a situation where the ratio of students to faculty is relatively high as is the case with OPM school, making sure that all the students understand each manoeuvre and have completed the required training can be problematic.

5.2.3 Evaluation of the outcomes of the implemented interventions

The study found out that the outcomes of OPM students who received skills lab-based training performed better while at practicum sites (orthopaedic practice II) than those who were traditionally trained (orthopaedic practice I).The skills level self-assessment pre-test given to the students showed that they did not know much of the techniques professionals do to arrive at the diagnosis of an orthopaedic patient. This timely feedback could have stimulated them to work hard to fill the knowledge gap and skills deficit identified in diagnosing an orthopaedic patient. While students were being traditionally trained, only one student got an outstanding score, the majority of whom were average and a considerable number of them were rated incomplete. On the other hand, when the same group of students were assigned rotations after skills lab-based training, performance meaningfully improved with majority of them attaining outstanding results, and a considerable decrease in students rated incomplete. The findings were in agreement with Dent and Hesketh (2003) whose report suggests that teaching students and residents procedural skills can be motivational (Arigbede, Denloye, & Dosumu, 2014).

All of the team players' view at the conclusion of AR cycle was that regular group reflection on the overall progress of the project would quicken the realization of the desired change or success story (leaving theory), some appreciated that timely feedback from other stakeholders came with key messages that helped them to improve their service delivery to the school. The findings could be as a result of students' exposure to similar approaches of clerking patients which lacked in the traditional form. Having clear learning objectives set by stakeholders during the preliminary phase of the FW could have been clearly specified, communicated and accepted by clinical instructors as team players (implementers). Good quality communication between clinical teachers in skills laboratories and clinical instructors at the clerkship sites could have been an important key that ensured proficiency in skills training and prevented skills lab from becoming an isolated educational event.

5.3 Conclusion

Skills lab-based training using the available resources meaningfully improved clinical clerkship competence among OPM students. It means that if the skills lab is well equipped, skills acquisition not only in clinical clerkship but in overall patient care would improve. This can be achieved through allocating more time for practice, purchase of curriculum materials like dummies and models, appointment of coordinators, clinical instructors, and skills lab technicians.

Utilization of the available resources like peers as patient simulators, study guides, available remaining parts of skeleton model, X-Ray films and viewer, broken limb immobilization equipment, plaster of Paris (POP), cotton wool and gauze rolls for casting techniques, among others motivated learners. History taking and physical examination skills practiced using peers as simulators improved proficiency in patient handling. Random grouping of students into two (dyads) prompted higher confidence in managing future patient encounters compared to traditional way of training alone.

Students' exposure to similar standardized patients in skills lab which lacked in the traditional form, having in place clearly and specified participatory set training objectives, good communication skills, team work, improved interpersonal relationship, regular reflection meetings, timely coordination and feedback averagely improved students' overall performance in all hospital rotations.

5.4 Recommendations

The following recommendations have been made based on the study findings:

- Stakeholders should be facilitated to re-plan new strategies for solving the pending issues related to establishment of a fully-fledged and well equipped skills lab and recruitment of a full time skills lab technician, adopting use of skills labs in the institute and appointment of clerkship coordinator at the level of a physician.
- Uganda Institute of Allied Health and Management Sciences (UIAHMS) should spearhead all reflective meetings which are key to improving situations and innovations.
- Timely feedback is a major key factor in motivating learning. There is a need to put in place an electronic evaluation and grading software system with various tools that are specific to stakeholders for purposes of evaluating not only the students but also the tutors, administration and curriculum as a whole.
- Since action research is cyclical, stakeholders should be facilitated for another FW to revise the action points that were not done as per plan to improve on the existing situation for attainment of the anticipated lasting solution for study problem.

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Appendix I
Consent Form

Part I: Consent

Consent form for the study participants on Utilization of Available Skills Lab Resources to Enhance Clinical Clerkship Competence at Mulago.

Study n°.....

Introduction

I am SEMAHORE CHRISTOPHER a student of Kyambogo University pursuing a master's Degree in Vocational Pedagogy. I am carrying out an action research on Utilization of Available Skills Lab Resources to Enhance Clinical Clerkship Competence at Mulago. This participatory study is trying to improve clinical clerkship competence among Orthopaedic Medicine students at the Uganda Institute of Allied Health and Management Sciences, school of Orthopaedic Medicine. The study will improve not only technical skills but also humanistic ones in handling an orthopaedic patient.

I will be grateful if you spare some time to voluntarily participate in this project as we work together to identify the root cause of the problem, agree on implantable interventions, monitor and evaluate implemented interventions and reflect on emerging issues for the purpose of re-planning and improving the existing situation.

Please kindly be a part of this democratic life-changing project as you demonstrate your capabilities as an agent of change while you take on the tasks you will liberally choose to do. Where there is a need to answer a questionnaire, please do it honestly and confidentially without revealing your name.

Thank you for your participation.

Part II: The participant's Rights

Participation in this participatory action research is voluntary and refusal to participate will not carry any penalty. In case you have any problem or questions relating to the study you are free to ask me at any time during the study period. You may contact Semahore Christopher on +256772485238 /+256704880240

Confidentiality:

The information that will be obtained from you will be treated with confidentiality and code numbers will be used on questionnaires. The information will be kept under lock and key.

Statement of consent

The purpose and nature of this study has been explained to me, understanding that my participation in this study is voluntary and that no consequence will result if I refuse to participate. I am free to withdraw from the study at any time.

.....	.....	.....
Participant's name	**signature**	**Date**
.....	.....	.....
Name of investigator or	**signature**	

Thank you for your participation.

DATA COLLECTION TOOLS

Appendix II
Skills Lab Resources Checklist

The following are the skills lab resource identified during the Future Workshop held on 28th November 2015 essential for improving the training of OPM students in clerkship.

Please indicate the number of items purchased or put in place to make the skills lab functional.

SN	Resource identified	Number of items requested	Number of Items Purchased	Success Rate	Failure Rate
1	Clerkship syllabus	1			
2	study objectives	23			
3	Study guides	102 skills			
4	Mannequins	5			
5	Models	5			
6	Ward and surgical Equipment	10 different sets			
8	Consumables	20			
9	Clerkship Coordinator	2			
10	Appointment and Training Clinical Instructors	7			
11	Clinical clerkship evaluation and grading system (Tools) software	14 Tools			
12	Appointment of skills lab Technicians	2			
13	Adequate time for practice	3 days a week			

Appendix III

The following statements are trying to capture your view of training OPM student in clerkship. For each statement please indicate to what extent you agree or disagree

SN	Statement	Strongly Agree	Agree	Unsure	Disagree	Strongly Disagree
1	Stakeholders' participation in skills lab based training has improved OPM students in clinical clerkship competence.					
2	I think my involvement in training OPM students on job has been among my successful element of my routine work over the last semester.					
3	**The key factors in this success has been:**					
i	Bed side teaching,					
ii	Skills impartation,					
iii	Demonstrations and return demonstrations,					
iv	Observation, while assisting during procedural tasks					
v	Pre-skills lab clinical teaching,					
vi	Case studies,					
vii	Assigning students projects					
4	**What didn't quite go to plan?**					
i	Purchase of dummies,					
ii	Purchase of DVDs,Audio-visual recorder, Animated					
	Diagrammatic Presentations					
iii	Purchase of surgical and ward equipment					
iv	Purchase of sundries (consumables)					
v	Preparation of study Guides					
vi	Preparation of Clerkship Syllabus, Objectives and Time table					
vii	Appointment of Clerkship Coordinator					
viii	Appointment and training of Clinical Instructors					
ix	Appointment of Skills Lab					

	Attendant					
x	Development of Evaluation and Grading System (Tools)					
5	**The key factors in things not going as planned**					
i	Lack of funds					
ii	Un interested Team players					
iii	Lack of follow up					
iv	Un availability of requested materials on local market					
6	As a stakeholder I contributed to bring about a change for improvement in the process of implementing the assigned task					
7	Timely Feedback from other stakeholders come with key messages that have helped me to improve my service delivery to the school.					
8	Participating in skilling OPM students has been a life changing experience and I am encouraged to interface with learners in a different way from the past.					
9	I can now support training in clinical clerkship skills acquisition using the available resources around me.					
10	Regular group reflection on the overall progress of the project would quicken the realization of the desired change or success story/leaving theory.					

Appendix IV

Pre-Clinical Clerkship Skills Level Assessment

Please indicate at which level you believe that you at the present time can perform the following skills on a patient

	I tried the skill/manoeuvre:				
Skill or Manoeuvre	**I did not try the skill during previous clerkship**	**but I cannot perform it**	**and I can perform it supervised**	**and I can perform the skill unsupervised**	**and I master It**
Heart auscultation					
Lymph node palpation					
Lung auscultation					
Urethral examination					
Blood pressure measurement					
Pulse count					
Anal rectal examination					
Paediatric examination					
Abdominal palpation					
Neurological examination					
Knee, hip examination					
Ankle ,foot pain assessment					
Spine examination					
Neck and Arm shooting Pain					
Shoulder pain assessment					
Elbow pain assessment					
Wrist and Hand pain assessment					

Low back, hip and leg shooting pain assessment					
Knee Pain assessment					
Ankle Pain examination					
Foot Pain Assessment					
Interpretation of various radiographic and lab investigations					

Appendix V

Work Process involved in producing a standard competent clinical clerk

Work process	Tasks	Competence required
Patient care	1. Compassionate, appropriate, and effective for the treatment of health problems and the promotion of health. 2. Required to construct appropriate management strategies (diagnostic and therapeutic) for patients with common health care problems that may be emergent, acute or chronic, across the spectrum of disciplines, while considering costs for the patient and others. 3. The graduate must be able to combine knowledge of basic biomedical, clinical, and cognate sciences to accomplish the above.	Graduates should be able to : Obtain a full appropriate medical history. • Perform a skillful physical examination. • Formulate a differential diagnosis and problem list. • Perform competently all medical and invasive procedures required for graduation. • Perform order and interpret diagnostic investigations that result in accurate diagnosis and treatment. • Utilize data to reason and solve problems. • Develop management plans. • Consider cultural and socioeconomic factors in management options. • Form an effective therapeutic relationship. • Recognize life threatening health problems and institute appropriate initial therapy. • Construct a therapeutic plan for relieving pain, alleviate suffering and directed toward specific resolution of health problems. • Counsel and educate patients and their families. • Apply the principles of epidemiology and evidence-based medicine.
Medical knowledge	1. Graduation competencies must include mastery of the necessary body of knowledge within the basic, clinical, and cognate sciences to manage patients' health. 2.Graduates must demonstrate the skills that will enable them to utilize the concepts and Knowledge gained for life	Graduates should have the ability to use: • Scientific principles of basic and clinical sciences that will enable him/her to competently practice evidence-based medicine. • Determinants of poor health, disease-based risk factors, factors for disease prevention and healthy lifestyles (principles of preventive medicine). • Principles of health education. • Principles of epidemiology and population-based medicine. • Principles, risks, and possible benefits of complementary and alternative medicine. • Concepts, principles, and application of evidence-based medicine.

		• Investigatory and analytical thinking approach to clinical situations to be able to translate new and emerging concepts to improve patient care. • Psychological, social, economic, and cultural factors pertaining to health. • Legal and ethical concepts relating to health care.
ractice-Based earning and nprovement	The competent graduate must be able to study, reflect, and evaluate patient care practices, appraise and assimilate scientific evidence, and understand their learning needs. He/she must be committed to lifelong learning.	Graduates should have ability to: • Assess his/her strengths and weakness in order to improve performance and identify effective ways to address limitations and enhance expertise. • Access information effectively, efficiently, critically appraises the information and relates it to their patients' health problems. • Admit his/her limits of knowledge, knows what to do when those limits are reached, can deal with uncertainty, and respects the opinions of others. • Recognize the need to learn is continuous.
terpersonal ..d ommunication kills	The competent graduate provides compassionate, effective, culturally sensitive patient care while respecting patient autonomy.	Listens attentively and effectively. • Communicate clearly with colleagues and consultants. • Communicate clearly with patients, and patients' families. • Manage difficult patients and/or difficult relationships such as angry or manipulative patients. • Work effectively with other members of interdisciplinary health care teams, including translators.
rofessionalism	The competent graduate approaches medicine with integrity and respect for human dignity. They must demonstrate awareness of and commitment to the principles and responsibilities of medical professionalism.	Graduates should be aware of the unique doctor/ patient relationship. • Knows and admits to his/her limits of knowledge. • Recognizes the need to learn as continuous. • Balances personal and professional commitments to ensure that the patient's medical needs are always addressed. • Recognizes and avoids conflicts of interest in financial and organizational arrangements for the practice of medicine. • Demonstrates integrity. • Demonstrates respect for human dignity. • Recognizes key ethical dilemmas and applies ethical principles.

		• Demonstrates a commitment to ethical principles pertaining to provision or withholding of clinical care, confidentiality of patient information, and informed consent. • Demonstrates a commitment to excellence and on-going professional development.
ystem-Based ractice	The competent graduate demonstrates an awareness of and responsiveness to the larger context and systems of health care.	Understands the principles of health care delivery and can describe the organization, strengths and limits of various models of health care delivery systems. Defines health in terms of the community in which the patient lives (population-based medicine); Describes how to appropriately utilize and integrate the services of multidisciplinary health providers. Practices cost-effective health care that does not compromise quality. Evaluates and integrates hospital and community resources well; minimizes overuse of health care resources. Works collaboratively with other health professionals to optimize the quality of care rendered, reduce medical error and increase patient safety.

Source: University of Illinois College of Medicine at Urbana-Champaign 2015

Appendix VI

Evaluation Form on Student Clerkship Performance during Clinical Rotations

Student.....Clerkship

Mentor/Instructor.....

Clerkship Name & Number	Clerkship Dates: From- to	Today's Date
Location of clerkship/elective:		

Students will be graded on each of the listed dimensions using the 5-Point Likert scale outlined below.

(5) O = Outstanding – Student performs at a level observed in only the most outstanding students over the years. Students who receive this designation will be recognized as those whose absolute performance is consistently outstanding and who are active, self-directed learners.

(4) ADV = Advanced – This designation is reserved for students who are especially proficient but not consistently outstanding in knowledge, skill, and performance.

(3) PR = Proficient – Performance may be outstanding at times and is, in general, within the range expected for medical students who are progressing satisfactorily. These students function and learn effectively in a variety of settings and meet all clerkship requirements.

(2) INC = Incomplete – Student has not completed all required clerkship activities due to illness, leave of absence, etc. If this grade is assigned, the faculty will describe the activities which remain to be completed.

(1) U = Unsatisfactory – This grade is reserved for those individuals who have not met all practical placement requirements for successful completion of the clerkship and further are judged to be beyond remediation. This grade is most likely to be assigned to a student who has completed one or more remediation attempts unsuccessfully but might also be assigned if clerkship faculty are convinced further efforts to complete the clerkship are not in the best interest of the student or the public

Appendix VII

Observational Checklist of Core Competences Expected during Clinical Rotations

EVALUATION DIMENSIONS	**GRADE**
BASIC KNOWLEDGE OF – pathophysiology, basic mechanisms, and clinical medicine in this discipline	**1 2 3 4 5**
APPROPRIATE USE OF ACADEMIC AND CLINICAL LITERATURE – independent reading and learning	
ABILITY TO PRESENT AND DISCUSS CASES – clear, concise, and well organized	
CLINICAL SKILLS – ability to arrive at a reasoned problem list and differential diagnosis, to formulate a treatment plan, and to follow patient's progress	
INITIATIVE – PERSEVERANCE – willingness to work hard, to learn, to accept responsibility, and to participate actively	
HISTORY AND PHYSICAL EXAMINATION SKILLS – logical and complete history, appropriately thorough and complete physical examination using proper technique and skill	
DEPENDABILITY – PUNCTUALITY – RELIABILITY	
PROFESSIONAL RELATIONSHIPS – attitude toward and respect for peers, physicians, other health team members, patients, and family	
CLERKSHIP EXAMINATION (oral and/or written if applicable)	

Appendix VIII
Individual or Group Reflection interview Guide

Evaluate in your own or group opinion the outcomes of the participatory implemented interventions to improve training in clinical clerkship competence among OPM students at Mulago.

Thinking about your work with the OPM School, what have you learnt over the last quarter about stakeholders' participation in enhancing skills lab based training of OPM students in clinical clerkship competence?

What do you think has been the most successful element of your work over the last quarter?

What were the key factors in this success?

What didn't quite go to plan?

What were the key factors in things not going as planned?

What changes did you make to your activities/approach with the stakeholders as a result of these issues/events? Please be as specific as possible about how you have applied new solutions/strategies/resources.

What are the key messages you have gained from community / world of work feedback during this quarter?

From your experiences during this reporting period, what will you do differently in the future? Please be as specific about the changes you will make to how you are supporting clinical clerkship skills acquisition training (e.g. what other skills, resources, tools or processes might you use)

What other comments or reflections do you have for this reporting period?

Please describe any changes that you have seen in clinical practice/patient care since the stakeholders -led project start-up began.

Appendix IX
Evaluation and Grading Software Template

Tool	Evaluator	Rate
General objectives one group pre-posttest checklist	Faculty Team	5 piont likert scale
Skills level self-assessment	Faculty Team	5 point Likert scale
Students' clerkship performance on clinical rotations	Clinical Instructors	5 point Likert scale
Overall students' average score after clinical rotations	Faculty Team	5 point likert scale
Pre-skills lab clinical teaching evaluation checklist	Faculty Team	6 point Likert scale
Review of students' clinical encounters	Faculty Team	5 point Likert scale
Faculty teaching global rating scale	Peer/Administration	5 point Likert scale
Clerkship Teachers	Peer/Administration	5 pont Likert scale
Clerkship Teaching Methods	Physician, Students, Faculty Staff	5-scale Likert
Equipment and Supplies	Faculty Team,Students	5-scale Likert
Clerkship education effectiveness evaluation	Physician, Students, Faculty Staff	6-Scale Likert

Appendix X
Map Showing Study Site at UIAHMS- Mulago

Appendix XI
Letter of introduction

KYAMBOGO UNIVERSITY
P. O. Box 1 Kyambogo, Phone: 041-285001/2 Fax: 041-220464
www.kyambogo.ac.ug
FACULTY OF VOCATIONAL STUDIES
DEPARTMENT OF ART & INDUSTRIAL DESIGN
MASTERS IN VOCATIONAL PEDAGOGY PROGRAMME

10th November, 2015

The Principal Uganda Institute of Allied Health and Mangement Saiences.

RE: INTRODUCTION OF SEMAHORE CHRISTOPHER

This comes to introduce to you SEMAHORE Christopher a student of Masters in Vocational Pedagogy (MVP) Programme at Kyambogo University. This student bears registration no. 14/U/12994/GMVP/PE and in his final year. As a requirement for graduation, this student is expected to carry out Action Research through a collaborative process with World of Work.

Any support rendered to his is highly appreciated.

Looking forward to your usual support.

KYAMBOGO UNIVERSITY
A/C No. .....
Date. .....
MASTERS IN VOCATIONAL PEDAGOGY

Yours Sincerely,

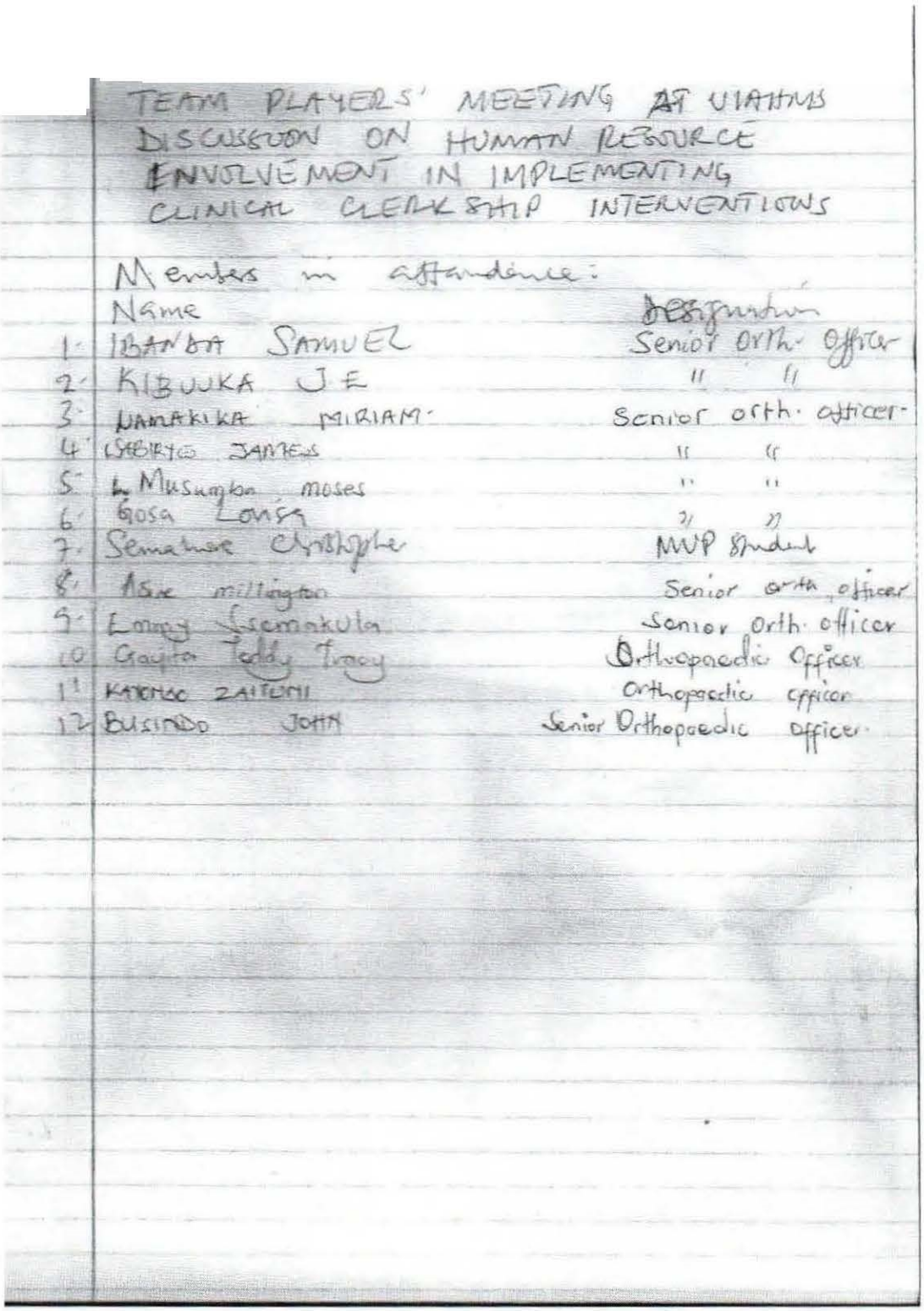
Chris Serwaniko
Project Coordinator, NORHED MVP Program
Masters in Vocational Pedagogy Program

A/Registrar

Permission is hereby granted for Mr. Semahore ... student research in ...

UGANDA INSTITUTE OF ALLIED HEALTH AND MANAGEMENT SCIENCES-MULAGO
PRINCIPAL'S OFFICE
16 NOV 2015
(UIAHMS)

Appendix XII
Team Players' Meeting at UIAHM



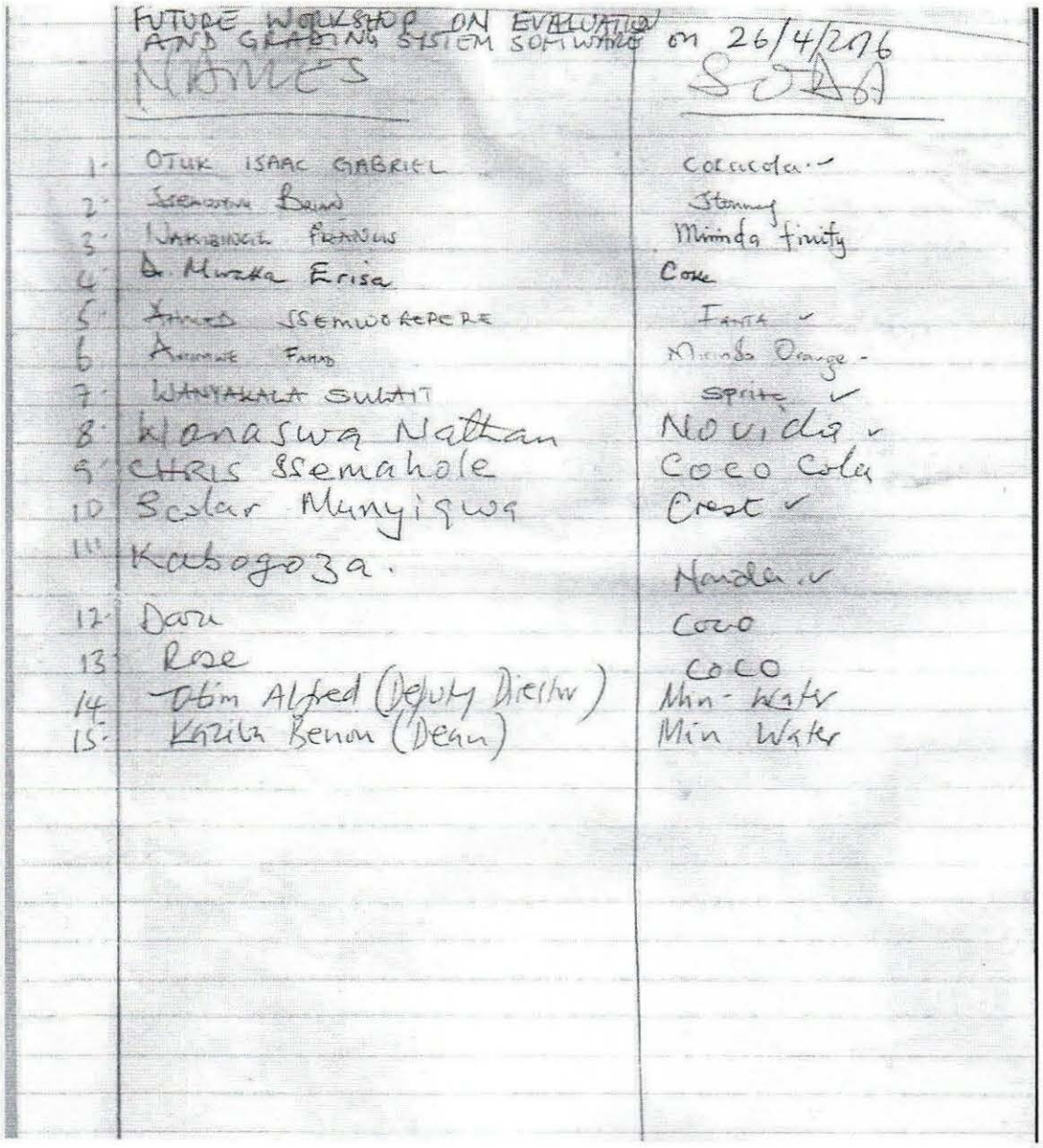
TEAM PLAYERS' MEETING AT UIAHMS
DISCUSSION ON HUMAN RESOURCE
INVOLVEMENT IN IMPLEMENTING
CLINICAL CLERKSHIP INTERVENTIONS

Members in attendance:

	Name	Designation
1.	IBANDA SAMUEL	Senior Orth. Officer
2.	KIBUUKA J E	" "
3.	NAMAKIKA MIRIAM	Senior orth. officer
4.	SABIRYE JAMES	" "
5.	Musumba moses	" "
6.	Gosa Louisa	" "
7.	Semahere Christopher	MVP Student
8.	Asue millington	Senior orth. officer
9.	Emmy Ssemakula	Senior Orth. officer
10	Gayita Teddy Tracy	Orthopaedic Officer
11	KAYONGO ZAITUNI	Orthopaedic officer
12	BUSINDO JOHN	Senior Orthopaedic officer

Appendix XIII

Future Workshop on Evaluation and Grading System Software on 26/4/2016



FUTURE WORKSHOP ON EVALUATION AND GRADING SYSTEM SOFTWARE on 26/4/2016

	NAMES	SODA
1.	OTUK ISAAC GABRIEL	Coca cola. ✓
2.	[illegible]	Stanny
3.	[illegible]	Mirinda fruity
4.	Dr. Mwaka Erisa	Coke
5.	[illegible] SSEMWOGERERE	Fanta ✓
6.	[illegible]	Mirinda Orange.
7.	WANYAKALA SULAIT	Sprite ✓
8.	Kanaswa Nathan	Novida ✓
9.	CHRIS Ssemakole	Coca Cola
10.	Scolar Munyigwa	Crest ✓
11.	Kabogoza.	Mirinda. ✓
12.	Daru	Coca
13.	Rose	COCO
14.	Otim Alfred (Deputy Director)	Min. Water
15.	Kaziba Benon (Dean)	Min Water

Appendix XIV

Clinical Clerkship Future workshop 26/11/2015 Attendance list

CLINICAL CLERKSHIP

FUTURE WORK SHOP 26/11/2015

ATTENDANCE LIST

1. Musinguzi Adolf (Yr II OPM).
2. AKENA PATRICK OKELLO (Yr I OPM)
3. AHIMBISIBWE SOLOMON (Yr I OPM)
4. WALUSAGA JUMA (Yr II OPM)
5. Kitemagwa . Dilisa
6) DR. WALUWA Gonzaga (Lecturer Pharm
(7) MUSUMBA MOSES

Appendix V

Clinical Clerkship Future workshop – Mulago 26/11/2015 Attendance list

CLINICAL CLEKSHIP
FUTURE WORKSHOP - MULAGO
ATTENDANCE LIST 26/11/2015

1.	SSENTONGO ANDREW	3yr student OPM
2.	NANTEZA ESTHER	3yr student OPM
3	MUKI MUSEMA	3 Yr. Student OPM.
4.	ICIKITI JOEL	3rd yr student OPM.
5.	MUHUMUZA WILSON	Academic Registrar (UIAHMS).
6.	Munyigwa Scholastic	P. OPM.
7.	CHANWAT JAMES	2 Yr. Student OPM.
8	ODONG SAMUEL REMMY	1st yr student OPM.
9	AHABWE OBVIOUS	1st year student OPM
10.	KIGAMA DENIS	3rd yr OPM.
10	MUGARURA WILLBROAD	Administration