

**USING A BLUE PRINT IN SETTING UAHEB EXAMINATIONS TO ENHANCE  
PRACTICAL CONTENT IN ASSESSMENT OF CLINICAL OFFICER TRAINEES  
IN UGANDA**

**BY**

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**MARCH, 2023**

**DECLARATION**

I, Kabasinguzi Veronica of registration number 17/U/14848/GMVP/PE, declare that this action Research Report is my original work and has never been submitted to any institution.

Signature.....

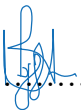
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**APPROVAL**

This action research report has been written under our supervision and is hereby submitted for the award of a master's degree in Vocational Pedagogy with our approval as Supervisors.

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## **DEDICATION**

This action research report is dedicated to my beloved sister late SUSAN KATUSIIME ADYEERI who sacrificed all she had including her own life to lay my academic foundation. And my dear friend late IRENE RINA AKOT who offered holistic support and participate in the study.

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**To God Be the Glory and Honour**

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## **LIST OF ACRONYMS/ABBREVIATIONS**

BMED	Bachelor of Medical Education
BVET:	Business Technical Vocational Education and Training
CBA:	Competence Based Assessment
CbD:	Case Based Discussions
CBET:	Competence Based Education and Training
CHBA:	Continuous Hospital based Assessment
CME:	Continuous Medical Education
CO	Clinical Officer
CPD:	Continuous Professional Development
DCM:	Diploma in Clinical Medicine and Community Health
DOPS:	Direct Observation of Procedural Skills
DVS:	Directed Vocational Study
H/C	Health Centre
KYU	Kyambogo University
Mini- CEX:	Mini Clinical Evaluation Exercise
MoES	Ministry of Education and Sports
MoH	Ministry of Health
MVP:	Masters in Vocational Pedagogy
SBA:	School Based Assessment
SOCO:	School of Clinical Officers'
VET:	Technical Vocational Education and Training
UAHEB:	Uganda Allied Health Examinations Board
UNEB:	Uganda National Examinations Board
VET:	Vocational Education and Training

VHTs: Village Health Teams

ZPD: Zonal of Proximal Development

## ABSTRACT

Following media reports and public complaints about inadequate practical skills among Clinical Officers, senior professionals have attributed the blame to UAHEB assessment that is alleged to be largely theoretical. We conducted Action research to identify and implement strategies for increasing practical content in UAHEB assessment. We then evaluated the effect of using a blueprint in setting on the nature of assessment of Clinical Officer trainees at UAHEB. We conducted an Action Research involving UAHEB secretariat staff, principals and directors of Clinical Officer training schools, tutors and instructors, setters, moderators, proof readers, and Clinical Officer trainees. We reviewed UAHEB past examinations, conducted a work process analysis, future workshop, and implementation workshop. We used a pre-tested questionnaire to assess stakeholders' satisfaction with the use of a blueprint to set UAHEB examinations for Clinical Officer trainees. Past UAHEB examinations contained 40.7% practical content across the three years of study and 38.5% in examinations for the First Year of study. Setting test items was identified as the most critical step to address the problem. Using a blueprint in setting UAHEB examinations was identified as the most effective strategy to increase practical content in UAHEB assessment. In this study, a blue print means a tabulated plan outlining curriculum content, ranked according to significancy and specification of actions that the trainee is required to demonstrate in an assessment. Practical content in UAHEB assessment for the First year of study increased from 38.5% to 52.5% when a blueprint was used in setting assessments for Clinical Officer trainees. Therefore, using a blueprint in setting test items for the assessment of Clinical Officer trainees is an effective strategy to increase practical content in assessment at UAHEB. There is need to emphasize practical content while setting test items for DCM trainees, and UAHEB should train and support examiners to develop and use Test Blue Prints in setting test items for the assessment of clinical officer trainees and UAHEB should adopt using a Blueprint in setting test items for all her programs.

## **CHAPTER ONE: INTRODUCTION**

### **1.0 Overview**

This chapter presents the background of Vocational Education Training (VET); background of diploma in clinical medicine and community health training in Uganda; background of assessment of clinical officer trainees in Uganda and the changing trends, background of the study; Statement of motivation; Situation analysis; Statement of the Problem; Purpose of the study; and Study objectives. It also contains Research questions, Justification and Significance of the study, Scope of the study and Definition of key terms.

### **1.1 Vocational Training and Vocational Pedagogy as a field of study**

#### **1.1.1 Back ground to Vocational education and training**

Technical Vocational Education and Training (VET) is defined in various ways. Some of the definitions given include; the development and application of knowledge and skills for middle level occupations needed by society from time to time (Moodie, 2008 as cited by Cedefop, 2017), an education and training that provides the necessary knowledge and skills for employment (UNESCO, 2015) and a composition of education, training and skills development relating to a wide range of occupational fields, production, services and livelihood. In this study, the definition by the European Centre for the development of Vocational training (Cedefop) was adapted, this defines VET as an education and training which aims to equip people with knowledge, know how, skills and/or competences required in particular occupations of more broadly on the labour market (Cedefop, 2017). This definition focuses on the combination of theoretical and practical learning and considers learning to be situated, contextual bound and solution oriented. This is a mirror reflection of the purpose for training a clinical officer, an all-round health care provider equipped with relevant practical competences to solve day today clinical problems.

In the contemporary world of work, characterised by rapid and dramatic change; the attainment of competence has become an integral component of individual, organizational and national strategies (Heid et al, 2015). Investing in a strong public vocational educational and training sector is crucial in knowledge-based societies as well as developing countries. VET is viewed as a vital aspect of the educational process in all countries given the immense scientific, technological and socio-economic development either in progress or envisaged, which characterises the present era, particularly globalisation and the revolution in information and communication technology. Since VET provides access to skills and entry routes into the labour market, societal and economic development highly depend on its strength.

The development of VET has become one of the most important strategies in both developing and developed countries (Paryono, 2017) and it is viewed as a tool for productivity enhancement leading to economic and social development. Thus, due to the fact that vocational education is particularly important for promoting economic development, expanding employment size and improving the quality of employment, world over governments are undertaking reforms on the education and training systems to meet the demand for an appropriately skilled workforce in an evolving global economy.

Uganda's Vision 2040 is focused on transformation of Uganda from a peasant to a modern and prosperous country within 30 years demands having an enhanced economy and improved service delivery to achieve such a vision of a 'modern and prosperous country'. In the recent campaign of "Skilling Uganda", Technical – Vocational skills have been pointed out as essential for individual, enterprises and the economy as they enable individuals to increase productivity and hence raise income. In the skilling Uganda strategy, it was noted that employers in Uganda often complain about skills shortages constraining production, quality of service delivery and expansion. This strategy embraces VET as a better option for production



of critical skills among Ugandans. It is viewed as a sound investment for the individual, the employer, and the economy.

VET covers a wide range of skills development opportunities aligned to national and local context. The International Labour Organisation (ILO) recommendation concerning human resource development; education, training and lifelong learning states that; members should ensure that VET systems are developed and strengthened to provide appropriate opportunities for the development and certification of skills relevant to the labour market (ILO, 2014). In Uganda, skills development for participants in the labour force is important because of various reasons including; technological change, higher value added and the increased competition emerging from trade liberalisation that accelerate demand for higher skills and productivity among workers. This is a true fact as skilled workers readily adapt to new processes both in production and service delivery.

In the current globalizing world, the economic development drives the demand for expertise and high-quality workforce in the various fields of the whole society, leading to a new round of development of vocational education. A demand responsive skills system requires greater engagement of employers in the VET system, a more flexible structure of training and assessment and better information about labour market demands. Soft skills like communication, customer care, problem solving, work attitudes and ethics that are necessary for modern work are underemphasised in training programs. The efficient and effective delivery of health care training as a vocation also requires not only imparting knowledge and technical skills but also analytical and communication skills, counselling, evidence and system-based care as well as interdisciplinary care. This complex, demands for assessment systems that are comprehensive, sound and robust enough to assess the requisite attributes in conjunction with the testing for essential knowledge and skills. Thus, a need to bend the

training of vocational programs clinical officers inclusive more in workplace environment and making assessment to be more practical than theoretical as this will enable achievement of valid and reliable training and assessment.

The advent of globalization demands for more specialized labour market, higher levels of skills and diversified vocational education. Improving the skills and knowledge of workforce is crucial for achieving and maintaining economic competitiveness, especially in a context of progressing globalization. Quality and relevant VET, can provide people especially the youth, with the knowledge, skills, and competencies required for the jobs of today and tomorrow. Better skills training through practical dominated assessments preferably in real working situation can help support decent work, more equitable and inclusive growth and be the bridge between education and the labour market.

Recognizing the pivotal role of skills training, especially for young people, to increase their chances for employment, the 2030 Agenda for sustainable development has set a number of ambitious targets under sustainable development goal (SDG) 4 on quality education and SDG 8 on decent work and economic growth, all of which focus on improving quality of production and service delivery through education. Three categories of vocational education are recognized in the Ugandan context and these are formal, non-formal and informal. This is similar to the forms of education identified by (UNESCO- UNEVOC, 2006) under VET as formal, non- formal, and informal learning. Training of clinical officers' fall under the formal vocational Education and training where training, assessment and awards are done formally.

Whereas the aim of VET is to provide individuals with occupational related knowledge, skills and attitudes that fits them in specific trades, historically too much emphasis has been placed on determining whether trainees can pass exams (theory dominated). Minimal efforts are put in to ascertain whether trainees can perform the role expected of them in world of work.

Heid et al (2015), noted that choosing an assessment that is directed to enhancement of learning in addition to assessing clinical competence in health training as one of the challenges of teaching in the training of health professionals. Therefore, training and assessment should target to ensure that trainees perform job tasks required in the world of work.

In the recent years Ministry of education and sports of Uganda embarked on reforming VET with the aim of increasing number of people with skills for work as well as improving on quality of skilled workforce. Among the reforms put into consideration was the establishment of VET specific National Examinations Boards. Examination Boards were established to streamline, harmonise, control and regulate assessment of the different vocational programs. The established Examination Boards are; Directorate of Industrial training (DIT), Uganda Business and Technical Examinations Board (UBTEB), Uganda Nurses and Midwives Examinations Board (UNMEB) and Uganda Allied Health Examinations Board (UAHEB) which assesses Allied Health professionals Including Clinical Officer Trainees. In the same vein, in the year 2018, the Ministry of Education and Sports established a unit named as World Skills Uganda (WSU) that is responsible for organising and conducting VET skills competition among trainees as a way of enhancing practical skills acquisition among trainees. As of now, this unit of the ministry is already registered with World Skills East Africa (WSEA) and World Skills International (WSI) and it has presented candidates to participate in the different technical skills though has not yet been qualified to present candidates in from health training.

### **1.1.2 Back ground to the Diploma in Clinical Medicine and community health program in Uganda**

The idea to train Clinical Officers in Uganda emerged way back in 1917 when Dr. Albert Cook took on the initiative to start a Medical Training School for dressers and dispensers. Dr Albert's idea to start training Ugandan health workers followed the work

overload to the health workers team that was present. The much demand for health services was majorly due to the prevalent Trypanosomiasis and Syphilis diseases that were occurring at epidemic levels in the country. Albert Cook, who had set a health care unit at Namirembe Hill thought that equipping interested Ugandans with basic skills in health service delivery would facilitate his medical work. He thus started to voluntarily offer informal training using apprenticeship mode of instruction. It was Albert Cook's initiative to train medical cadres that gave rise to the establishment of health training institutions for medical practitioners in Uganda including that for clinical officers.

By the year 1918, Uganda had started training medical assistants (currently known as clinical officers) under the Ministry of Health. Following the 2<sup>nd</sup> World war, the Ugandan protectorate government identified health professional training as one of the strategies to absorb returnees from the war as well as care for their health. In 1946, the current Masaka school of Nursing was established to equip Ex-service men with medical skills. Those with good formal education were trained for two years to become medical assistants while those with little formal education were trained for one year to qualify as nursing orderlies (MoH, 1994).

In 1950, Government decided to transfer the training of medical assistants from Masaka to Mbale due to the increased demand for both medical assistants and nurses (Mbale SOCO biography, 2000) . Thus, Mbale School of medical assistants (currently Mbale College of Health Sciences) was established under the headship of the Medical Superintendent of Mbale hospital. By then, most of the training and assessment was done in the hospital setting and this was dominated by practical (hands on) examinations. Trainees then spent most of the time in the hospital interacting with patients, doctors and other health cadres which gave them great

opportunities to learn and practice clinical skills. In 1969 two more public institutions were opened, one in the west (Fort portal) and another in the north (Gulu).

In 1997, the Medical Assistants' curriculum was reviewed and the course content expanded to involve primary health care components, the years of training were increased from two to three and the award was upgraded from medical assistant certificate to diploma in clinical medicine and community health (MoH, 2004). The title of person qualifying from the program to was changed from Medical Assistant to Clinical Officer. In 1998, health training was transferred from Ministry of Health to Ministry of Education and Sports.

Currently, the DCM program in Uganda is one of the Allied Health Professional programs under the Health Education and Training (HET) Department of MoES. It is three-year full-time program. Currently the DCM program is offered in twenty-five (25) health training institutions three of which are public and the rest are private for-profit institutions under UAHEB. The current curriculum defines a Clinical officer as a general medical practitioner based at medical health centre to offer both clinical and community health services including diagnosis, treatment, preventive and rehabilitative services, referral of advanced cases as well as performing management and administrative tasks (MoES, 2013).

For effective diagnosis of disease conditions; proper clinical history taking, physical examination of the patient, ordering and interpreting laboratory and radiological investigations are very fundamental for any practicing Clinical Officer. Therefore, for one to qualify as a competent Clinical Officer, he/she requires to be well assessed to ascertain that he/she has gained adequate knowledge, skills and attitudes essential for execution of the specific job tasks. In this regard, the theory dominated examinations may not be reliable to judge whether the learner has attained the required knowledge and skills to fit him/her in the world of work to execute the job tasks with no or minimal supervision.

### **1.1.3 Background to assessment of clinical officers and the changing trends in Uganda**

Assessment is a key component of all education system and plays a critical role in students' learning journey (Amanda, 2015). It is such a vital stage in the teaching learning process that serves the purpose of gathering information on how much and how well the learner has achieved from the teaching learning process thus guiding judgement of the learners' achievement. Like any other education program, clinical officer trainees undergo assessment during training and certification is based upon successful completion of the three-year training with satisfaction of the Examining Board's requirement for the award of a diploma in clinical medicine and community health. Important to note is that there have been a number of changes in assessment conduct and criteria since the year 2009 when UAHEB was inaugurated to conduct and control assessment of all allied health professional trainees clinical officer trainees inclusive (UAHEB performance report, 2019).

Before the educational reforms in 1998, the Clinical Officer training program was run by Ministry of Health and offered at three (3) public institutions based at regional referral hospitals (Mbale, Gulu and Fort portal) (UAHEB performance report, 2019). Assessment and training were completely a role of the senior technical hospital staff (consultants, doctors, senior clinical officers, senior specialised clinical officers, senior nurses and laboratory and radiological officers). Trainees had fulltime access to the hospital (workplace), the learning was more based in the various clinical areas with few theory-based lessons conducted in outpatient department waiting areas in the evening hours. Learners were often guided to master clinical skills following the "Observe – Assist - Perform under observation and Perform independently processes a reflection of apprenticeship mode of learning.

The assessment of learners was more often carried out during the clinical practice and it was majorly informal (and on a few occasions formal) involving assigning specific tasks to

learners by senior staff, observation of clinical procedures during patients care and giving feedback, asking question to assess learners clinical knowledge during ward rounds, asking trainees to demonstrate examining for different clinical sign, tasking trainees to clerk and present cases to the senior staff and colleagues during ward rounds, case based discussions held in the doctors, vivas among others (MoH, 1994). This kind of assessment was purposed to offer learning opportunities to learners (assessment for learning) rather than to judge them as having failed or passed. At the end of every academic year, summative theory and hospital-based assessment was conducted but this would only be taken by those students identified as competent by the various clinical departmental heads.

When the training for all health professionals' including clinical officers was transferred from MOH to MOES under the BVET department (currently HET department), a number of changes followed and these impacted greatly on the assessment and training of clinical officers. For instance, assessment of trainees was made school-based dominant since hospital-based assessment became very expensive. Most Tutors remained mostly locked in school conducting theoretical lessons, many hospital staff neglected teaching of trainees as they considered this out of their job tasks, drastic increase in enrolment to allow raise enough funds to run institutions, commercialisation of training. With these changes, the training institution enabled to continue placing trainees in hospitals for practice at specific time blocks depending on negotiations made with hospitals. Assessment of trainees in the clinical areas was only considered at the end of second and third year. Second year trainees were assessed once in every specialised department (dental, ophthalmology, maternal and child health and psychiatry) and this was only in a form of case presentation and oral interview. Third year candidates (finalists) were subjected to two formal assessments in the hospital setting that is mid semester two mock examinations by internal examiners in the four clinical disciplines

(gynaecology and obstetrics, medicine, surgery, and paediatrics) and end of course exam by a team of external and internal examiners also in the same disciplines.

The assessment for finalists in each clinical discipline had two parts; part one (long case) that involved a single case presentation per candidate followed by oral interview and part two (short case) involving a five-minute interview on either a patient selected randomly or medical equipment used in the specific discipline. This drastic change in assessment modes greatly impacted on learner's level of skills acquisition and competence level at the time of graduation which resulted in public outcry on quality of services offered by most of the training institutions.

In response to the continued outcry on the declining competence level of graduating of Clinical Officers and other allied health professions, government established Uganda Allied Health Examinations Board (UAHEB) by the BVET Act, 2008. UAHEB was mandated to streamline, regulate, harmonise and coordinate examinations and awards in the Allied Health Profession in Uganda. In execution of its mandate, UAHEB initiated several changes that in turn impacted on training and skills acquisition by trainees. Concentrating on the impacts on clinical officer training, the following are vital to note; the ` of the national assessment enhanced the institutions motivation to cover the curriculum unlike in the past where curriculum coverage was emphasised in the final year in preparation for national examinations which were administered once in the entire course; improved objectivity in assessment (resulting from utilisation of centrally set examinations following the curriculum, Conveyor Belt System (CBS) of marking theory papers, use of objective structured practical examinations (OSPE), central management and custody of examination results) as compared to the high subjectivity that existed in individual teacher/ institution manned examination (UAHEB establishment guidelines, 2009).



In the first seven years of UAHEB operations, there was no any form of formal hospital-based assessment conducted for clinical officer's trainees in the entire course of training. This greatly affected the learners' utilisation of hospital placement as there seemed to be no significant value (in terms of score) attached to hospital placement. In fact, some institutions more especially the private for-profit ones completely abandoned hospital placement for trainees since this reduced on the expenditure and did not directly impact on trainees' performance in examinations. From the world of work, the outcry on rising numbers of incompetent clinical officers increased and this became a song of the day in every stakeholders' feedback meeting on assessment organised by UAHEB and this was attributed to the use of OSPE exams conducted in classrooms and occasionally in the skills laboratory using models and rarely simulated patients instead of assessing trainees on real patient cases in the hospital setting.

In response to the above, UAHEB re-embarked on conducting end of course summative hospital-based assessment in the four clinical disciplines, using the long case and short case presentations. Also, the assessment of logbooks for trainees to evaluate the clinical experiences encountered by the learner throughout the training was initiated. These interventions have registered a slight improvement in institution and learner's motivation to practice hospital-based teaching and learning. However, due to nature of assessment a lot remains to be desired due to the following limitations; very narrow scope (snapshot) of assessment since a trainee presents only one case per discipline, assessor based bias leading to subjectivity of the assessment, candidates not offered chance to learn from the examiner or be guided to correct their mistakes, easy to spot cases to be examined on by the candidates and not convenient to assess for major clinical procedural skills like minor surgeries such as circumcision, incision and drainage in surgery, managing labour in obstetrics, parenteral drug administration in

medicine and many others. Thus, relying on such assessment to judge learners' competence acquisition may not be satisfactory.

## **1.2 Background to the Study**

As a Senior Examinations Officer, at the Uganda Allied Health Examinations Board (UAHEB) in charge of Clinical Medicine program, I got concerned about media reports and public concerns about inadequacies in practical skills among Clinical Officers. A televised documentary on *NBS Investigate* featured a Clinical Officer in Private Practice alleged to have misdiagnosed and subsequently mismanaged a patient and accused to have contributed to the eventual loss of life.

Some Senior Practitioners attributed skill inadequacies among Clinical Officers on UAHEB nature of assessment which they claim to be largely theoretical. Related complaints have on several occasions been brought before the Medical Clinical Officers' Board, an advisory Board of the Allied Health Professionals Council (AHPC) on which I represent the Health Tutors.

## **1.3 Statement of Motivation**

As a student of Masters in Vocational Pedagogy at Kyambogo University, in the module PV621 (Curriculum development, measurement and evaluation in vocational education and training and PS 512 (Educational psychology), I was exposed to theoretical knowledge on appropriate assessment approaches for promotion of learning and competence acquisition which encourage trainees' active participation in the entire assessment process right from preparation to conduction and evaluation of the assessment. This exposure sparked me to engage with the stakeholders to explore and implement assessment approaches for enhancement of competence acquisition among clinical officer trainees. The zeal to use assessment to enhance competence acquisition among trainees was stirred by my Directed

Vocational Study (DVS) reflection where I analysed the use of theory dominated examinations in the assessment of Allied Health Trainees (AHTs) by Uganda Allied Health Examinations Board (UAHEB). I discovered that trainees majorly concentrate on mastery of knowledge content, for purposes of reproducing it to pass examinations at the expense of gaining clinical competence for practice in the world of work. This is evidenced by rising number of qualified clinical officers engaging in the practice of lower cadre health professionals like dispensing drugs in pharmacies and drug shops, unjustified referral of patients with minor conditions, poly-pharmacy prescriptions, and diversely wrong diagnoses made in clinics, increasing court cases of mismanaged patients among others.

Making reference to the five (5) years I have served as an examination officer with responsibility of organising assessment for clinical officer trainee, I have come to realise that the kind assessment in practice both at school and national level is majorly knowledge based. Most questions demand learners to recall and reproduce the theory content learnt and the few questions set at level of knowledge synthesis and application which require learners to apply clinical experiences are quite often failed as revealed in the marker's reports. This leads to many of these candidates scoring borderline marks or fail completely. As stated, that assessment of medical trainees on practical content is fundamental to their development and on-going learning (Singh & Modi, 2013) I am convinced to believe that implementation using a test blue print to increase practical content in assessment will not only enhance competence acquisition among trainees but also will motivate these trainees to become lifelong learners since practical skills in clinical practice involve every day. Basing on the observation made by Ronald and Epstein, (2007) that assessment drives learning it is vividly clear that increasing practical content in assessment of clinical officers will lead to increased practical skills acquisition by trainees hence resulting into improved service delivery in clinical care of patients.

Working with UAHEB as an Examinations Officer, I have participated in inspection of training institutions to ascertain the preparedness for end of semester examinations which we administer. Surprisingly, in several institutions more so private for-profit schools, I noted that students are not scheduled for clinical placement in the first semester simply because they are assessed theoretically.

With reference to the currently graduating Clinical Officers and public outcry to have competent and skilled youth being passed out from Vocational Institutions, there is need to initiate a paradigm shift from assessing learners on mastery of “what is done” that is mastery of knowledge rather to assessing learners on “how it is done” that is mastery of knowledge and skill. Such paradigm shift can best be achieved if we bend the assessment to more practical content than theory.

#### **1.4 Situation Analysis**

Following media reports and public concerns about inadequacies in practical skills among Clinical Officers, which senior practitioners attributed to UAHEB’s nature of assessment, I reviewed a sample of UAHEB past examinations and results of the review showed that DCM assessment contained 40.7% practical content, below the 65% recommended by the CBET curriculum of the program.

#### **1.5 Introduction to the objectives and problem**

I and other UAHEB secretariat staff conducted a Work-Process Analysis of the conduct of examinations by the Board. A pair-wise ranking matrix was used to identify the critical area of concern that members agreed to have significant influence on the nature of assessment at the Board. Later, a future workshop was organised involving different stakeholders concerned with assessment of Clinical officer trainees at the Board.

In the Work-Process analysis, we identified four (4) main steps that directly influence the nature of assessment at the Board, namely: Setting of Test Items, Moderation of Set Test Items, Question Paper Development and Administration of the Examinations. Using the Pair wise matrix of ranking, participants agreed on “Setting of Test Items” which accrued the highest scores in the ranking as the most significant influencing factor affecting the nature of assessment by the Board. We agreed to conduct a future workshop with concerned stakeholders to find tangible solutions.

According to Jungk and Muller (1987), A future workshop is defined as a five phased tool used for problem identification in a given setting. The purpose of the FW is to democratically identify the problem, agree on the most appropriate action to be undertaken to solve the identified problem, and then take on the agreed action with the aim of improving the situation. The five phases of the future workshop are; Preparation phase, Critical phase, Fantasy phase, Reality phase and Implementation phase. In this study, the FW was organized and conducted in two stages, the first stage involved preparation, critical, phantasy and reality phases while the second stage covered the implementation phase.

During the future-workshop, stakeholders pondered on the area of concern presented that is “Setting test Items” and then identified strategies for enhancing practical content in the assessment of Clinical Officers. Using the Pair wise matrix of ranking, stakeholders agreed on using a test blue print in setting UAHEB examinations as the most feasible and important strategy to enhance practical content in the assessment of Clinical Officer trainees in Uganda. Results of the implementation are presented in chapter four of this report.

## **1.6. Statement of the Problem**

Uganda Allied Health Examinations Board (UAHEB) assessment for Clinical Officers trainees contains about 40.7% practical content (Review of Past Examinations). This is far below the 65% practical content recommended as minimum by the competence based education and training (CBET) curriculum of the program (MoES, 2013). This gap in content assessed could significantly impact on the quality of training and Clinical Officers released to the world of work.

Too often, employers complain that the content possessed by their workforce does not closely connect enough with the requirements of a particular occupation (Bill Lucas, 2012). Formal assessment and qualifications are necessary to benchmark standards and assure quality but they can be misleading if they don't measure what is intended (Whittington & McLean, 2001). The ultimate goal of vocational training in Clinical Medicine is development of working competencies in the field and this is what the results of the assessment must reflect (Bill Lucas, 2012). This implies that assessment in Clinical Medicine should measure what the trainee can do.

UAHEB has standardized assessment of Clinical Officers whereby trainees sit the same examination across all Examination Centres in the country. As one of the purposes of assessment, it is expected to provide information for employers about what the trainee knows and can do. On the contrary, there are growing concerns among employers about practical skills deficits among successfully passed out Clinical Officer trainees. This challenge has been attributed to UAHEB nature of assessment that stakeholders argue that is largely theoretical (Professional council reports and DCM task force members). When not urgently addressed; stakeholders are concerned that it would lead to passing out trainees who cannot practice,

increase examination and medical malpractice, loss of public trust in the profession and eventual collapse of the program (Future workshop results).

In this Action Research, stakeholders agreed to implement the use of a test blue print in setting UAHEB examinations to enhance practical content in the assessment of Clinical Officer trainees in Uganda.

### **1.7 Purpose of the Study**

The purpose of this study is to use a test blue print in setting test items so as to enhance practical content in the assessment of Clinical Officer trainees at UAHEB examinations.

### **1.8 Specific Objectives**

The specific objectives of this Action Research are:

1. To identify strategies for enhancing practical content in the assessment of Clinical Officer trainees at UAHEB examinations.
2. To implement strategies for enhancing practical content in the assessment of Clinical Officer trainees at UAHEB examinations.
3. To evaluate the effect of using a test blue print in setting UAHEB Examinations to enhance practical content in the assessment of Clinical Officer trainees at UAHEB examinations.

### **1.9 Research Questions**

1. What are the strategies for enhancing practical content in the assessment of Clinical Officer trainees at UAHEB examinations?
2. How can the strategies for enhancing practical content in the assessment of Clinical Officer trainees at UAHEB examinations be implemented?

3. What is the effect of using a test blue print in setting to enhance practical content in the assessment of Clinical Officer trainees at UAHEB examinations?

### **1.10 Justification of the Study**

Clinical Medicine and Community Health deals with disease management and prevention, and health promotion for individuals and families in the community. It is a practical profession that demands hands-on skills from the front-line professional and this needs to be reflected in both the training and assessment.

If UAHEB is to provide “assessment for quality health” as reflected in the Board’s motto, assessment of Clinical Officer trainees should emphasize practical skills as required in the CBET curriculum of the program. UAHEB’s Examinations for Clinical Officer trainees are largely theoretical as reflected in results of the reviewed past examinations. Stakeholders are concerned that if the status quo remains, trainees likely to qualify when they cannot practice, facilitate examination and medical malpractice, unemployment, loss of public trust in the profession and eventual collapse of the program (Future workshop results).

In this study, the researcher and stakeholders identified strategies and agreed to use of a test blue print in setting UAHEB examinations to enhance practical content in the assessment of Clinical Officer trainees in Uganda so as to promote hands-on skills among Clinical Officers.

### **1.11 Significance of the Study**

This Action Research is likely to increase curriculum content coverage in the assessment, stakeholders’ (trainees, tutors and professionals) satisfaction with the assessment, hands-on skills among Clinical Officers out-putted by the assessment and competitive advantage of successful trainees in the job market.



## **1.12 Scope of the Study**

### **1.12.1 Geographical Scope**

This study focused on Health Training Institutions in Uganda with an accredited UAHEB Examination Centre for assessment of Clinical Officer Trainees pursuing a Diploma in Clinical Medicine and Community Health.

### **1.12.2 Content Scope**

This study focused on enhancing practical content in the assessment of Clinical Officer trainees at UAHEB examination by identifying strategies for increasing the practical content, implementing the use of a test blue print in setting UAHEB examinations and evaluating the impact of using a test blue print in setting UAHEB examinations on the proportion of practical content in the assessment of Clinical Officer trainees.

In this study, we targeted to increase the proportion of practical content in the assessment of Clinical Officers at UAHEB examinations from 40.7%, obtained in the review of past examinations, to 65% recommended as minimum in the CBET curriculum of the program.

### **1.12.3 Time Scope**

This study was conducted during the academic year 2019/2020 and 2020/2021. The Work- process analysis and future workshop were conducted at the end of academic year 2019/20, while the implementation and evaluation of impact of the selected interventions was done in the academic year 2020/2021. However, the duration of the academic year was significantly affected by the school closures caused by the Covid-19 pandemic.

## **1.13 Definition of Operational Terms**

**Assessment:** are means of gathering evidence and judgement on whether a trainee has met the stipulated minimum standard required at a specific level.

**Clinical Officer Trainee:** is a person undertaking vocational training at a recognized institution, who upon fulfilling examination requirements of an authorized body for a stipulated course duration is to be awarded a Diploma in Clinical Medicine and Community Health.

**Clinical Officer:** is a general medical practitioner based at a medical health centre and is able to perform both clinical and community health services covering diagnosis, treatment of disease and injury and minor surgery. He/she offers preventive, promotive, curative, rehabilitative health services and is able to perform management and administrative tasks to human and physical resources.

**Examination:** is a set of test items approved to measure standard of competence of a trainee.

**Health Tutor:** is a qualified and experienced health worker, with additional pedagogical training, entrusted with the responsibility to teach health workers trainees both in the classroom and practicum sites. Those without formal pedagogical training are sometimes referred to as Instructors. In this study, they shall both be referred to as Health Tutors.

**Practical assessment:** are means of gathering evidence and judgement that seek a candidate to describe or demonstrate a skill of performing a task required in the world of work.

**Practical Content:** a set of practical test items contained in an examination

**Practical Skill:** is the ability to do activities (perform task) with meaningful, observable and measurable outcome at an acceptable level.

**Professional Council:** is an authorized state regulatory body that oversees professional practice of a group of professionals. Clinical Officers belong to a group of Allied Health Professionals whose practice is regulated by the Allied Health Professionals Council of the Ministry of Health in Uganda.

**Setting:** is a process of developing test items that can be used to assess whether a trainee meets the requirements for performing tasks of a Clinical Officer at an acceptable level.

**Stakeholder:** is anyone invested in the conduct and success of assessment of Clinical officer trainees. In this study, they include Health Tutors, Test Item Setters, Training Institution administrators and managers, UAHEB Secretariat staff and researchers.

**Test Blue Print:** it is a table outlining curriculum content, learning outcomes/ objectives and specification of actions that the trainee is required to demonstrate in an assessment.

**Test Item:** is a practical or theoretical instrument used to measure the trainee's level of competence at performing a required task.

**Theoretical assessment:** this is one that requires a candidate to state or explain concepts or principles underlying a particular idea or subject.

**Work Competence:** is a set of specific skills required to do an economically viable job (a task that attracts payment).

## **CHAPTER TWO: LITERATURE REVIEW**

### **2.0 Overview**

This chapter presents a review of literature related to enhancement of practical content during assessment as reflection of the most needed competences in the world of work for a qualified Clinical Officer. It includes a review of theories that underlie the Action Research Approach employed in this study. A review of theories is focused on learning, participation, power and development while a review of enhancement of practical content in assessment is based on Study Objectives focusing on identified strategies for enhancing practical content in assessment, implementation of identified strategies and evaluation of the impact of implemented strategies in enhancing practical content in assessment.

### **2.1 Theoretical Framework underlying the Action Research**

Every research process involves some form of ‘action’ (like interviewing, distributing questionnaires, etc.), but action research refers to something rather different. It involves people in a process of change, which is based in professional, organisational or community action. Action research can thus be perceived as a process which alternates continuously between inquiry and action, between practice and innovative thinking (Hart, 2000). We explore theories that underpin this approach.

This study was informed by the achievement motivation theory, attribution theory, social cognitive theory, perceptions of control, self-concept, intrinsic motivation theory and the goal theory. We believe that assessment is a motivation to learning. Cognitively, motivation is the process of instigating and sustaining goal directed behavior (Schunk & Zimmerman, 2008). Learners set goals and employ cognitive processes (e.g., planning, monitoring) and behaviors (e.g., persistence, effort) to attain their goals. As with learning, motivation is not observed directly, but rather inferred from behavioral indexes such as verbalizations, task choices, and goal-directed activities.

Motivation helps us understand why people behave as they do. Although some simple types of learning can occur with little or no motivation, most learning is motivated. Students motivated to learn attend to instruction and engage in such activities as rehearsing information, relating it to previously acquired knowledge, and asking questions. Rather than quit when they encounter difficult material, motivated students put in greater effort. They choose to work on tasks when they are not required to do so; in their spare time they read books on topics of interest, solve problems and discuss cases, and seek additional guidance from experts. In short, motivation engages students in activities that facilitate learning.

### **2.1.1 The Drive Reduction Theory**

The Hull (1943) theory, which postulates that deficits in needs instigate the drives to reduce the needs. Drive (D) was the motivational force that energized and prompted people and animals into action. Behaviour that obtained reinforcement to satisfy a need resulted in drive reduction (Need → Drive → Behaviour). In this study, learner's perceived need to excel in a national assessment drives him/her to attend classes, practice in the skills laboratory and participate in clinical skills training at practicum sites to gain competences required needed to be displayed during the assessment (Praveen, 2017).

### **2.1.2 Model of Motivated Learning**

This model emphasizes that motivation is intimately linked to learning and that they can affect one another. It is a cognitive model because it views motivation arising largely from thoughts and beliefs. The model portrays three phases: pre-task, during task, post-task. This is a convenient way to think about the changing role of motivation during learning.

During the pre-task phase, several variables influence students' incoming motivation for learning. Students enter tasks with various goals, such as to learn the material, perform well, finish first, get some part-time job as they study and so on (Kathryn R. Wentzel., Allan

Wigfield., 1998). Not all their goals are academic. Students enter with various expectations which may involve capabilities for learning (self-efficacy) and perceptions of the consequences of learning (outcome expectations). Students also have differing perceptions of the value, or perceived importance, of learning (Wigfield & Eccles, 1992). Students differ in their affects associated with learning. They may be excited, anxious, or feel no particular emotion. These affects may be related to students' other needs, which some theories postulate to be important. In this study, the pre-test phase denotes the period during training at Health Institutions and health facilities. It is important that a learner perceives the need to perform to the expected minimum standard as reflected in the assessment results.

During the task, Instructional, contextual (social/environmental), and personal variables come into play during learning. Instructional variables include teachers, forms of feedback, materials, and equipment. Although these variables typically are viewed as influencing learning, they also affect motivation. For instance, teacher feedback can encourage or discourage; instruction can clarify or confuse; materials can provide for many or few successes. Contextual variables include social and environmental resources. Factors such as location, time of day, distractions, temperature, ongoing events, and the like can enhance or retard motivation for learning. Many investigators have written about how highly competitive conditions can affect motivation (Meece, MeeceEric, Anderman, AndermanLynley, 2006). Students' social comparisons of ability with peers directly link to motivation. Personal variables include those associated with learning, such as knowledge construction and skill acquisition, self-regulation variables, and motivational indexes (e.g., choice of activities, effort, and persistence). Students' perceptions of how well they are learning and the effects instructional, contextual, and personal variables influence motivation for continued learning. During task phase in this study implies the period when the candidates undertake the assessment, reflecting on the material studied and instruction taken during training. It is

motivating to learners to encounter assessment content related to experiences gained during training.

Post-task denotes the time when the task is completed, as well as periods of self-reflection when students pause during the task and think about their work. The same variables important prior to task engagement are critical during self-reflection with the addition of attributions, or perceived causes of outcomes. All of these variables, in cyclical fashion, affect future motivation and learning. Students who believe that they are progressing toward their learning goals and who make positive attributions for success are apt to sustain their self-efficacy for learning, outcome expectations, perceived value, and positive emotional climate. Factors associated with instruction, such as teacher feedback, provide information about goal progress and outcome expectations. Thus, students who expect to do well and receive positive outcomes from learning are apt to be motivated to continue to learn, assuming they believe they are making progress and can continue to do so by using effective learning strategies.

In this study, Post-test phase implies the period when the assessment results are released and candidates graded according to performance. It is expected to motivate learning if those who expend more effort to learn and practice merge with better grades.

### **2.1.3 Expectancy-Value Theory**

John Atkinson (1957; Atkinson & Birch, 1978; Atkinson & Feather, 1966; Atkinson & Raynor, 1974, 1978) developed an expectancy-value theory of achievement motivation. The basic idea of this and other expectancy-value theories is that behaviour depends on one's expectancy of attaining a particular outcome (e.g., goal, reinforcer) as a result of performing given behaviours and on how much one values that outcome. People judge the likelihood of attaining various outcomes (Hart, 2000). They are not motivated to attempt the impossible, so they do not pursue outcomes perceived as unattainable. Even a positive outcome expectation

does not produce action if the outcome is not valued. An attractive outcome, coupled with the belief that it is attainable, motivates people to act. Atkinson postulated that achievement behaviours represent a conflict between approach (hope for success) and avoidance (fear of failure) tendencies. Achievement actions carry with them the possibilities of success and failure. Key concepts are as follows: the tendency to approach an achievement-related goal (Ts), the tendency to avoid failure (Taf), and the resultant achievement motivation (Ta). Ts is a function of the motive to succeed (Ms), the subjective probability of success (Ps), and the incentive value of success (Is): Research on task difficulty preference as a function of level of achievement motivation has yielded conflicting results (Slade & Rush, 1991). These researchers assumed that fear of failure would be reduced following task success, so they predicted the tendency to choose easy tasks would diminish over time (Ashley, 2021).

## **2.2 Literature related to Specific Objectives of the Study**

Assessment is a fundamental component of teaching and learning. It is the process of collecting and documenting information on individual student learning. The purpose of assessment is to inform teaching and improve learning. Hence, assessment of learning and assessment for learning are integral parts of the teaching and learning process (Falchikov, 1989).

Before making a choice of assessment method, some important questions must be asked: what should be assessed? Why assess? For an assessment instrument one must also ask: is it valid? Is it reliable? Is it feasible? What is assessed and which methods are used will play a significant part in what is learnt (Wass, Cees & Shatzer, 2001).

A student's success in demonstrating what he/ she knows or is able to do may vary. His/her level of success may depend on such factors as the time of day, the situation, the type of



questions asked, familiarity with the content and child's willingness to perform at any one time (Falchikov, 1989).

Learning in practical disciplines is active and assessment needs to be done while the learning is happening. The best opportunities to assess student learning occur within natural learning environment with set up similar to that expected to be encountered upon completion of training with students working individually and in small and whole groups. Assessment should be frequent, well planned, and well organized so that teachers are able to assist each learner in progressing towards meeting the required standard of performance of the curriculum outcomes (Norman, 2003).

Assessment strategies should encourage students to show what they know and what they can do, rather than focusing on what they do not know or cannot do (Wass, Van der Vleuten, Shatzer, 2001). The assessor's greatest assessment tool is observation and documentation of performance because students show their understanding by doing, showing and telling. Therefore, assessors need to use the assessment strategies of observing, listening and asking probing questions to assess student's achievement. In addition to documented observations, other assessment tools include work or case records, photographs, videotapes or tape recordings, checklists, work samples and portfolios, conferencing and language arts student profiles (MFB., 2000). The assessment tools used should be consistent with beliefs about curriculum and classroom practices. They should clearly reflect student progress towards the attainment of curriculum outcomes outlined in the training program.

Assessment has a powerful positive steering effect on learning and the curriculum. It conveys what we value as important and acts as the most cogent motivator of student learning (Wass, Cees & Shatzer, 2001). Assessment is purpose driven. In planning and designing assessments, it is essential to recognize the stakes involved in it; the higher the stake, the greater

the implications of the outcome of the assessment. The more sophisticated the assessment strategies, the more appropriate they become for feedback and learning. Measuring progress in acquiring core knowledge and competencies may be a problem if the exams are designed to measure multiple integrated abilities, such as factual knowledge, problem solving, analysis and synthesis of information. Students may advance in a single ability and not in another. Therefore, progress tests that are designed to measure growth from the onset of learning until graduation should measure discrete abilities (Tabish, 2008).

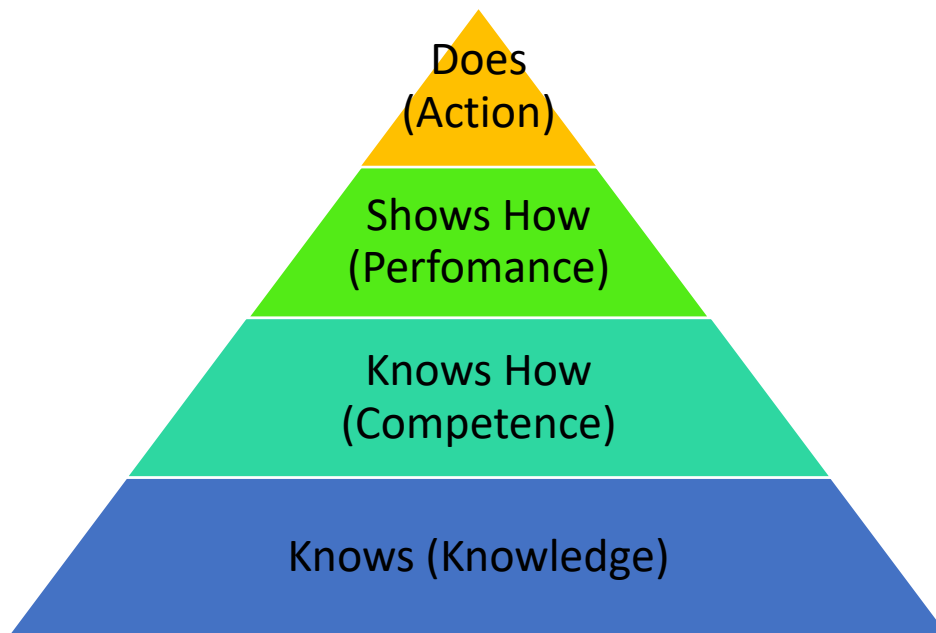
Mastery testing (criterion-reflected tests) requires that 100% of the items are measured correctly to determine whether students have attained a mastery level of achievements. In non-mastery testing attainment of 50% of a tested material is considered sufficient. Global rating scales are measurement tool for quantifying behaviours. Assessors use the scale either by directly observing students or by recalling student performance. Assessors judge a global domain of ability for example: clinical skills, problem solving, etc. Self-assessment (self-regulation) is a vital aspect of the lifelong performance of physicians. Self-monitoring requires that individuals are able not only to work independently but also to assess their own performance and progress (Epstein, 2002).

Every form of assessment can be used as a self-assessment exercise as long as students are provided with 'gold standard' criteria for comparing their own performance against an external reliable measure. Self-assessment approaches include: written exams (MCQs, True/False, Essay, MEQs, and modified CRQs), performance exams (checklists, global rating, student logbook, portfolio, video, etc). Oral examination/Viva has poor content validity, higher inter-assessor variability and inconsistency in marking. The instrument is prone to biases and is inherently unreliable. Long Essay Questions can be used for assessment of complex learning situations that cannot be assessed by other means (writing skills, ability to present arguments

succinctly). The Short Answer Question (SAQ) is an open ended, semi-structured question format. A structured predetermined marking scheme improves objectivity. The questions can incorporate clinical scenarios. A similar format is also known as Modified Essay Question (MEQ) or Constructed Response Question (CRQ). Equal or higher test reliabilities can be achieved with fewer SEQs as compared to true/false items. If a large amount of knowledge is required to be tested, MCQs should be used. SAQs have a better content coverage as compared to long essay question (Tabish, 2008).

Assessment devices must provide valid and usable data. Methods must yield reliable and generalisable data. Multiple assessment methods are necessary to capture all or most aspects of clinical competency and any single method is not sufficient to do the job (Tabish, 2008). For knowledge, concepts, application of knowledge ('Knows' and 'Knows How' of Miller's conceptual pyramid for clinical competence) context-based MCQ, extended matching item and short answer questions are appropriate. For 'Shows How' multi-station OSCE is feasible. For performance-based assessment ('does') mini-CEX, DOPS is appropriate. Alternatively clinical work sampling and portfolio or log book may be used (Van der Vleuten CPM, 1990).

Miller's assessment Model was proposed by a psychologist- George Miller in 1990 (Norcini, 2003). Miller proposed a four-level framework for assessing clinical competence/skills/performance that is; Knows (knowledge), Knows How (competence), Shows How (performance) and Does (action). He developed a pyramidal illustration of the four levels which is currently referred to as Miller's pyramid of assessment.



**Figure 1: Millers pyramid**

According to Miller (1891), the lowest level (Knows) targets assessment of factual knowledge and can be achieved using multiple choice questions, true-false, and essays; the second level ( knows how) focuses on assessment of integrated knowledge and this can be assessed using application and interpretation questions in form of MCQs, essay and viva voce; the third level (shows how) focuses on learners ability to demonstrate competence in a simulated situation or real clinical environment and can be achieved using OSCE and Direct Observation of Procedural Skills respectively; the fourth level (Does) targets to assess the learners actual performance in real clinical practice taking into account of knowledge, skills and attitudes which are key domains in the teaching- learning process and in the practice of clinical medicine.

Blueprinting refers to a process emphasizing that test content should be carefully planned against learning objectives. The purpose of assessment should direct the choice of instruments. Needs assessment is the starting point of good assessment that identifies the current status of the students before the commencement of the actual educational activities. Needs assessment is used to determine the existing knowledge base, future needs, and priority

areas that should be addressed. Student assessment is a comprehensive decision making process with many important implications beyond the measure of students' success (Ronald, M. & Epstein, 2007). Student assessment is also related to program evaluation. It provides important data to determine the program effectiveness, improves the teaching program, and helps in developing educational concepts. Good quality assessment not only satisfies the needs of accreditation but also contributes to student's learning. Assessment methods should match the competencies being learnt and the teaching formats being used (Tabish, 2008).

## **CHAPTER THREE: METHODOLOGY**

### **3.0 Introduction**

This chapter presents the study methodology. It includes the; study design, study population, method of problem analysis, sampling procedure, data collection, data analysis and presentation, ethical considerations, study limitations and dissemination of study results.

### **3.1 Study Design**

The study employed collaborative/participatory action research design. A design which is based on the proposition put forward by Kurt Lewin (1890 -1947) that causal inference about human behaviour is more likely to be valid when humans participate in building and testing them. In this study, research participants worked together with the principal researcher from the first stages of designing the study until when the study was concluded as supported by Whyte WF (1991) cited in (Illing, 2014).

Both qualitative and quantitative methods of data collection and analysis were employed in this study. Qualitative research approach focuses to study social, relational and experiential phenomenon in the natural setting. (Stella, Lorelei, & Tara, 2014). This approach is considered appropriate for studying group interactions, social processes or human experiences. Therefore, qualitative approach is suitable for exploration of objects of study within their natural environment, by observing and interacting with the people and places experiencing the phenomenon.

Quantitative methods were used to analyse data on the amount of practical content contained with UAHEB assessments. These methods were necessary because they helped to establish the magnitude of the problem and the need to have it addressed.

Action research was considered since it focuses on producing a social change through the process of research and the direct engagement of research participants in the process (Stella,

Lorelei, & Tara, 2014). Action research follows a sequential cycle of planning a change, implementing the change while observing the process and reflecting on the consequences of the change (Stella, Lorelei, & Tara, 2014). With Action research, participants collaborate with researchers to construct the results of the research and implement social change. this study targeted to yield a practically orientated examination for Clinical officer trainees.

### **3.2 Study Population**

Participants in this study included; the Secretariat Staff of the Examinations Board (UAHEB), namely: the Executive Secretary, Principal Examination Officer, Principal Administrative Officer, Senior Examination Officers, Examination officers, Accountant, Monitoring and Evaluation Officer; Principals of Health Training Institutions with a UAHEB credited Examination Centre for assessment of Clinical Officer Trainees; Health Tutors, Clinical Instructors and Trainees of Clinical Medicine and Community Health program; Directors and Proprietors of Private Health Training Institutions, Test Item Setters; Test Item Moderators and proof readers of examinations. These were considered based on their contribution to the development and successful implementation of a practically oriented assessment for Clinical Officer trainee.

### **3.3 Method of Problem Analysis**

The methods of problem analysis in this study included; documentary review, Work Process Analysis and the Future Workshop

#### **3.3.1 Review of Past UAHEB Examinations for Clinical Officer Trainees.**

Following public concerns about practical skill deficits among successfully passed out Clinical Officer trainees, as a Senior Examination Officer at UAHEB in-charge of Clinical Medicine and Community Health program, I developed a tool based on the operational definition of a practical assessment to measure the proportion of practical content in UAHEB

past examinations for Clinical Officer trainees. Past examinations for the recent three academic years were sampled and analysed in accordance to year of study. Results showed that generally, sampled past examinations contained 40.7% practical content and there was variation in this composition by year of study.

### **3.3.2 Work-Process Analysis**

Based on the results of a review of past UAHEB examinations, I and other UAHEB Secretariat staff including the Principal Examination Officer, Principal Administrative Officer, Senior Examination Officers, Examination typists, agreed to conduct a work-process analysis to identify areas of concern that could be addressed to improve practical content in the assessment of Clinical Officer trainees. In the process, we analysed the steps involved in the conduct of UAHEB examination and subsequently prioritised the steps based on their effect on the nature of content in the assessment. Setting Theoretical Test Items ranked highest as the most critical step of affecting the nature of content in UAHEB assessment.

### **3.3.3 The Future Work-shop**

A Future Work-shop was organized virtually using zoom application software to explore the process of setting test items at UAHEB as way to enhance practical content in the assessment of Clinical Officers. Stakeholders to be invited for the work-shop were identified based on the results of the Work-Process analysis which detailed the role of each in the conduct of UAHEB examinations. Invited stakeholders included UAHEB Secretariat staff like: The Executive Secretary, Principal Examinations Officer, Principal Administrative Officer, Senior Examination Officers, Examination Officers, Accountant; Test Item Moderators and Test Item Setters of Clinical Medicine and Community Health (DCM). A written invitation was sent to all the identified stakeholders and a copy information sheet about the future work. Each identified stakeholder was asked to respond in writing by email to express interest and



willingness to participate in the workshop. A zoom meeting link for the workshop was generated and shared among those who had consented to participate in the future work-shop.

A pilot meeting was held a day prior to the actual scheduled date of the work-shop to test the suitability of the equipment and software to facilitate the workshop and get some of the stakeholders to familiarize with participation in the virtual meeting.

Using the brainstorming technique, stakeholders pointed out that, passing out trainees who cannot practice, increase examination and medical malpractice, unemployment, loss of public trust in the profession and eventual collapse of the program as the pending consequences of theoretical assessment of trainees by the board. Stakeholders democratically agreed on using a test blue print in setting UAHEB examinations as the most significant strategy to enhance practical content in the assessment of Clinical Officer trainees.

**Proposed Program for Future  
Workshop on Assessment of Clinical  
Officers at UAHEB By Kabasinguzi  
Veronica**

<b>Activity</b>	<b>Time</b>
1. Introductory Remarks	10:00
2. National Anthem	10:00
3. Prayer	"
4. Opening Remarks	10:10
5. Overview of the workshop	10:15
6. Chat Comments	10:20
7. Introduction to the Workshop	10:25
8. Chat Comments	10:30

**Figure 2: A Screenshot of the program followed during an Online Future Workshop on Zoom**

### **3.4 Sampling procedures**

#### **3.4.1 Sample Size Determination**

The sample size was determined using the Krejcie and Morgan (1970) Table. Stakeholders were clustered according to their role in the conduct of UAHEB examinations. These included Institutional Principals, Test Item Setters, Test Item Moderators, Examination Officers (EOs), Senior Examination Officers (SEOs), Principal Examinations Officers (PEO), Principal Administrative Officer (PAO) and Accountant. The Executive Secretary UAHEB, PEO, PAO and Accountant were one (01) under each category and were purposively included in this study. Examination Officers were two (02) and Senior Examination Officers three (03). These were all included in accordance with Krejcie and Morgan (1970), who recommend including all participants if they're less than 10. Principals are 23 and we were supposed to select 19 but only nine (09) expressed willingness to participate were all considered for inclusion. Test Items Setters were thirty (30) and we were expected to select twenty-eight (28) were selected using simple random sampling. The future work-shop also involved Three (03) stakeholders from the Master in Vocational Pedagogy (MVP) program of Kyambogo University and a Supervisor.

#### **3.4.2 Sampling Technique**

The technique for inclusion into the workshop was mainly purposive, informed by findings of the Work-Process analysis. Stakeholders were included in specific categories. Within the categories, sampling of participants was done by simple random sampling in circumstances where all identified stakeholders, for example DCM trainees, were not considered for participation. In this study therefore, we employed the multi-stage, cluster, simple random sampling technique.

### **3.4.3 Sampling Procedure**

Based on results of the Work-Process analysis, concerned stakeholders in setting test items for Clinical Officer trainees were identified and listed down. Persons in these categories were also named using available records at the UAHEB secretariat. The required sample size was determined using Krejcie and Morgan (1970) table. For categories with members less than 10, were all considered for inclusion while categories with more than 10 members an appropriate sample size was determined using the table.

An invitation and information sheet were electronically sent to the identified stakeholders by email. This was later followed with a phone call to ascertain delivery of the message. Interested and willing stakeholders were asked to reply to the message electronically expressing their willingness or unwillingness to participate. The required number of participants determined by the table was then selected by simple random sampling among stakeholders who had expressed interest and willingness to participate in the workshop.

## **3.5 Data Collection**

### **3.5.1 Data Collection Method**

Data was collected using documentary review, work process analysis, future workshop, interviews, Focus Group Discussion and researcher's reflections and decisions during the action research.

### **3.5.2 Instruments of data collection**

The tools used for data collection in this study included a documentary review checklist, work process analysis the future workshop, guided discussions, brain storming, interviews, questionnaire and researcher's logbook and reflection notes.

### **3.5.3 Procedure of Data Collection**

Past UAHEB examinations for Clinical Officer trainees for the recent three years were retrieved. Both theory and practical examination were selected for the three academic years. Each of the examination was analysed using a review checklist to establish practical content in the examination.

Assessment content was classified as practical if it required a candidate to demonstrate or describe a skill of performing a task required in the world of work and as theoretical if it required a candidate to state or explain concepts or principles underlying a particular idea or subject. Same review was done for both theory and practical examinations selected. Collected data was analysed using proportions and presented in a table.

In the work-process analysis, stakeholders were asked to describe activities involved in the process of conducting examinations at the Board. Points of the activities were listed, elaborated to identify responsible persons and materials required and later categorised to form steps that constitute the examination process by the board.

In the Future-workshop, stakeholders' views were written as bullet points on sticky notes using Jam board application software. The chart was also used for participants to deliver their views. Generated views were then categorized thematically by combining those that were similar. Selection of significant points was done democratically and decision was by consensus.

During the implementation workshop, participants were reminded of the purpose of the study, guided discussions, brain storming and interviews were the main methods used for data collection. Participants' views written on butcher charts and displayed on the walls of the hall for everyone to see and comment. Resolutions from the implementation workshop were written down by a secretary and presented as an activity report.

During evaluation, the researcher used a researcher's logbook and maintained a researcher's diary to record all proceedings of the implementation process. A pre-tested questionnaire was administered to selected candidates and Health Tutors after each administered examination to assess the impact of using the blue print in setting UAHEB examinations.

### **3.6 Piloting the Study**

Piloting was done a day prior to the Future Workshop to test the suitability of equipment and zoom application software to facilitate the workshop. It was also done to familiarise members with the use of internet telecommunication facilities to participate in virtual meetings and workshops. Key challenges were identified and interventions implemented prior to the scheduled future workshop. A questionnaire for assessment of stakeholders' satisfaction with the use of a test blue print in setting was pre-tested on ten (10) randomly selected Clinical Officer trainees and ten (10) Health Tutors in Health Training Institutions within Kampala, using a past UAHEB examination which was set without using a test blue print. Results of the pre-test were used to refine the questionnaire and establish the time required to respond to the questionnaire.

### **3.7 Quality Control**

Data collection tools were informed by existing literature. The study process was closely supervised by Supervisors and guided by technical mentors from Kyambogo University, UAHEB and Health Training Institutions. All respondents' views were discussed and agreed upon democratically after building consensus both in the work-process analysis and the future workshop.

### **3.8 Data Analysis and Presentation**

Qualitative data analysis was manually done through coding and establishment of themes. Such data has been presented using narratives backed up by quotation. Quantitative data was analysed using frequencies proportions and presented using tables.

### **3.9 Ethical Considerations**

Approval to conduct the study was granted by Kyambogo University Graduate School. Conduct of the study was guided by technical supervisors from Kyambogo University and from the Health Training Institutions. Informed consent was sought from all participants and expressed in writing and delivered electronically by e-mail and via what's up. Participation was entirely voluntary.

### **3.10 Study Limitations**

The nature of Action Research that involves studying own weaknesses at the workplace targeting to improve the undesired situation is tempting that one may choose to conceal some of the weaknesses. This however, was minimised by staying open and allowing critique from colleagues without taking offense.

Due to the COVID 19 standard operating procedures, our study was limited to studying assessment for first year trainees only as the other classes (second and third year) were in a different cohort that did not sit exams in our study period. Nevertheless, the nature of action research being cyclic, this other cohort can be considered for study in another cycle.

### **3.11 Dissemination of Study Results**

Results from this study was disseminated to Kyambogo University, Department of Art and Industrial Design, UAHEB and Health Training Institutions with UAHEB accredited examination centres for the Diploma in Clinical Medicine and Community Health. Finding of the study shall be published in research journals for public consumption.

## CHAPTER FOUR: RESULTS

### 4.0 Introduction

This chapter presents results obtained at the different stages of study. It includes results of; problem analysis, identification of strategies, implementation of selected strategies and effect of the strategies on practical content in the assessment.

### 4.1 Problem Analysis

The problem analysed in this study was the composition of practical content in the in UAHEB assessments for clinical officer trainees.

#### 4.1.1 Method of Analysis

Documentary review was used as a method of data collection for problem analysis. Content analysis of UAHEB examinations for the academic years 2016/17, 2017/18 and 2018/19 was done to determine the proportion of practical content in the examination. Results are presented in Table 1 below.

**Table 1: Composition of Practical Content in Past DCM Examinations at UAHEB**

Assessment	Expected (%)	All Years (%)	First Year (%)	Second Year (%)	Third Year (%)
General	65	40.7	38.5	40.0	43.7
Theory	60	37.3	34.9	37.4	33.8
Gen. Practical	100	79.0	78.0	66.0	93.0

Examinations for the reviewed academic years contained less than half of the content as practical. There was significant variation in practical content in assessments across the years of study.

#### **4.1.2 Causes of low practical Content in assessment**

The work process analysis was used as a method of data collection to identify the causes of low practical content in the assessment. In this process, stakeholders started by outlining the tasks taken by UAHEB to assess Clinical Officer Trainees. The tasks identified were; Verification of candidates to establish their suitability for the programme, Registration of candidates, Time tabling of examinations, Setting test items, Moderation of set test items, Question paper development, Proof reading of question papers, Labelling of question paper envelopes, Printing of question papers, Packing examination materials, Distribution of examination materials. The other tasks identified were; Briefing of Coordinators, Invigilators and Principals, Receiving School Based Assessment results (SBAs) from the schools, Administration (Conducting, management and Supervision) of the examinations, Return of scripts and examination materials, Transporting scripts to the marking centres, Preparations for marking of scripts, Development of marking guides, Marking of scripts, Checking and Verification of candidates' scores, Identification and Management of suspected examination malpractice cases, Presentation of results to the exam committee, Discussion of results by the Board, Printing of final candidates' scores/results, Release of results and Giving examinations related feedback to stakeholders.

Thereafter, stakeholders undertook a thorough analysis of the steps under each task so as to identify the very critical task which could influence the nature of assessment by UAHEB; below is a description of the steps under each task;

##### **Registration of candidates;**

This involves both the Secretariat and Training Institutions. The Secretariat Accountant on behalf of the Executive Secretary issues a circular to the Principals (heads of training institutions) with UAHEB examination centers requesting candidates to pay the stipulated examination fees. The Secretariat's Principal Administrative Officer (PAO) on behalf of the



Executive Secretary also sends a circular to the Principals of examination centers requesting them to register eligible students for examination. The school/Center Principal registers students using the online registration system following the protocol for registration. He/she also compiles a list of registered students and submits it to the Board through the Principal Administrative Officer. The Secretariat Data Clerk and Records Officer visit the Examination centers with new candidates to capture their Bio-data and passport size photographs.

### **Verification of candidates to establish their suitability for the programme**

Uganda Allied Health Examinations Board (UAHEB) receives lists of verified trainees from the Health Education and Training department at the Ministry of Education and Sports (MOES). The Data Clerks together with the assigned Examinations Officer use the received lists to verify suitability the candidates registered by the schools. After verification, the Records Officers prepare examinations cards for the candidates legible to sit examinations.

### **Time tabling of examinations;**

This is a task of the Examinations Department; The Principal Examinations Officer (PEO) and his team develop the end of semester examination timetable in accordance with activity plan. The PEO then sends the draft timetable to the Principals of examination centers for verification. After verification, the PEO edits the draft timetable, presents it to the Executive Secretary, who in-turn submits it to the Board for approval. The approved timetable is then sent to Schools/Examination Centers one month prior the start of examination conduct.

### **Setting test items;**

This task involves a number of stakeholders and it is one of the most sensitive tasks of the Board. The Senior Procurement Officer ensures procurement of an examination setting center. Examination Officer(s) identify test item Setters for the various courses and submit the list to the Principal Examinations Officer (PEO). The PEO then submits the list of Setters to

the Executive Secretary for approval and later invites the approved test item Setters. The PEO also identifies a Facilitator from UNEB to orient test item Setters & other support participants e.g. typists. The PEO and his team of Examination Officers prepare setting materials and logistics (ruled & photocopying papers, blue & red pens, stapling machines & wires, computers & printers, extension cables, projector, Butcher charts & markers, appointment letters, curriculum, setting allowances, attendance lists, and payment sheet). The PEO invites typists to type the set test items.

The invited test item Setters, typists, Facilitator and UAHEB Secretariat Staff report and book in at the setting venue as per the set program. The PEO and keynote speaker address participants during an orientation exercise. Test Item Setters develop individual test blue prints, although often times this is not done. Participant often complain that the blue print is; never clear to them, not applicable in assessment of medical cadres, time consuming, setter biased and is for secondary school candidates' assessment. Test Item Setters develop questions from the teaching/ learning content and submit in questions for verification to the Examinations Officer in charge, although often times this is not done due to the limited time and the very few examination officers on ground. The test items are typed by the typists and a copy is printed for moderation.

### **Moderation of Test Items;**

This task follows shortly after completion of typing the set test items and it involves the following steps; The Procurement Officer ensures procurement of a moderation venue, although at times this can be done at the Secretariat headquarters due to limited financial resources. The Principal Examinations Officer (PEO) Identifies and invites Test Item Moderator(s) about four (4) per program. The PEO and his team of Examination Officers (EO) prepares moderation materials (printed copies of test items, timetable, red & green pens, appointment letters, curriculum, computers & printers, attendance lists, moderation

allowances, payment sheets, projector, butcher charts & markers, staples & wires, ruled and photocopying papers). Moderator(s) and the Secretariat staff report and book in at the moderation center and the PEO orients/briefs the Moderators.

The Examination Officer(s) gives printed copies of the set test items to the moderators for moderation, The Moderator(s) read through and improve the set test items (correcting typo and grammatical errors, Checking question difficulty level, and balancing content in line with the curriculum). Each moderator is assigned to moderate 3-7 papers depending on the available resources. While the moderators are expected to use approved blue prints during moderation, this is not always done. The Moderator(s) submit the moderated copies to a typist to make necessary amendments. The typist submits amended test item copies to the Examinations Officer for question paper development.

### **Question paper development;**

This is a task of examination officers. The Examinations Officer(s) mobilize(s) the required materials for question paper development (curriculum, question paper development guidelines, moderated test items, question bank). He/she reviews the moderated test items in relation to the training curriculum. He/she also selects appropriate questions from the moderated test items and the test item bank, and arranges them in accordance with the question paper development guidelines. He/she then allocates marks to questions in accordance with the question paper development guidelines and develops the cover page for the question paper and harmonizes it with the Examination Time table. The Examinations Officer then reviews the developed question paper to ensure that there is no duplication of a past paper, repetition of questions and dominance of a specific topic(s). Thereafter, he/she prints developed question papers for proof reading.

### **Proof reading of Question papers;**

The PEO selects and invites a Proof Reader (s) based on the semester content, experience in examination preparation and exhibited level of integrity by the professional. The Proof Reader (s) is/are briefed by the PEO on the tasks involved. Each Proof Reader checks out for errors in grammar, typo, mark allocation, content coverage and any repetitions in the examination papers assigned. He/she also reconciles the information on the cover page with that on the timetable. He/she then submits the proof-read paper with necessary corrections to the Examinations Officer(s) for appropriate adjustment. The Examinations Officer later edits the question paper to make necessary adjustments and saves the edited copy ready for printing.

### **Printing of Question Papers;**

During this task, the Examinations Officer prints the approved copy of the question paper per course unit, he/she reviews the printed question paper for any errors to be corrected prior submission to the printing team. He/she seals the copy in an envelope and labels it for submission to the Officer in charge of in the printery. The Principal Examinations Officer identifies and appoints a team of four printery officers, consisting of one internal and one external staff to operate the machines, and two Security Officers to guard the printing exercise. The Officer in charge of printing checks the question paper for proper page numbering, allocation of marks to different sections and compares it with information on the timetable. He/she enters details of the Question paper in a record book and then issues the recorded question paper to the team leader of the Printery Officers. The Team leader checks the question paper for completeness and to verify its details with those on the time table before approval for bulky printing (photocopying). Printery Officers then duplicate the question papers in relation to the number of registered candidates per examination center and temporarily packs the question papers in boxes with clear labels. The labelled boxes with questions papers are then assembled in secure metallic boxes, awaiting sorting, arranging and final packing.

**Labelling of question paper envelopes;**

The PEO temporarily appoints and invites experienced persons to label examination materials. They consist of both internal and external members. One or two internal persons are assigned to lead the team, The Team Leader (internal) mobilizes the required materials (time table, packing envelopes, return envelopes, coloured markers, coloured pens, list of examination centers with assigned codes, stapling machines & wires, working tables, examination bags, sell tapes, padlocks & keys, paper envelopes (A3, A4, A5, A6), coloured paper, coordinator's bags, thumb jelly) for labelling examination materials. Team members label the packing envelopes with paper names, paper codes, date, assigned center codes and number of scripts to be enclosed. They insert an unlabelled return envelope in each of the labelled envelopes and then rap envelopes for each course unit for the various examination centers together and pack them in a safe box ready for packing in examinations materials.

**Packing of examination materials;**

The PEO temporarily appoints and invites experienced persons (Packers) to pack examinations materials who consist of both internal and external members including all those who do the labelling. Two of the team members are assigned to lead in the entire activity of packing. The team leader (internal) is handed over the bulk copies of the question papers. Team members sort and arrange question papers for a course in tens awaiting parking in the envelopes for the respective centers. They then pack question papers for each examination center in accordance with registered number of candidates and seal the parked envelope for each center and transfer them to a safety room for temporary storage.

The team leader mobilizes bagging materials (masking tape, marker, water proof bag padlocks) and labels the water proof bag with the center name. Team members pack the sealed envelopes in the bag, one at a time starting with the envelope containing the examination to be done last on the timetable so that the envelope containing the first examination on the timetable

is at the top. The team leader then locks the bag, seals a key in a small envelope (A6), labels it with the center name, puts it in a box and is kept in a safety room. The PEO mobilizes materials to be put in the coordinator's bag (Stapling machine and wires, pens, markers, identification tags, forms and guidelines). Team members label the coordinator's bags with the respective center names and pack all the required materials for the center.

#### **Distribution of examination materials;**

The Senior Examination Officer and Head of drivers prepare the routing plan. The Principal Administrative Officer on behalf of the Executive Secretary writes a letter to the AIGP Commissioner in charge of examinations requesting for Security Officers to escort transportation of examination materials. The Principal Administrative Officer writes a letter to sister institutions and stakeholders requesting for additional vehicles and drivers to help in the transportation of examination materials. The Principal Administrative Officer prepares delivery letters to the Officers in Charge of a police Stations, where examination materials are to be delivered for safe custody. The PEO requisitions for money to cater for examination materials distribution (Allowance for drivers, Security Officers and Secretariat staff escorting examination materials as well as fuel). Drivers and Secretariat staff escorting are given temporary appointment letters.

The Team leader of the packing team and drivers arrange examination bags in the packing room in accordance with the prepared transportation routes. The bags are verified and packed on the transporting van. The driver, two Security Officers and a Secretariat staff set off to deliver examination materials at the designated police stations. On arrival to the police station, the Secretariat Staff hands over examination bags to the Police Officer in Charge, The Secretariat Staff , the driver and a hired porter carry the examination bag into a safe room (Armory) for safe custody. The Secretariat Staff, Security Officer and O.C station sign

appropriate delivery forms and then, the Driver, Secretariat staff and Security Officers drive back to the Secretariat.

### **Appointment and Briefing of Coordinators, Invigilators, Principals and Heads of Practical;**

This task involves a number of personnel who take on different roles. The Examination Officer(s) proposes Coordinators, Invigilators and Heads of practical. The proposed names are handed over to the Principal Examinations Officer who reviews and compiles a list which he submits to the ES for further scrutiny. The ES scrutinises the list with other members of top management and presents it to the Examinations Committee (EC) for approval. The EC approves the list of names of Coordinators, Invigilators and heads of practical. The Procurement Officer prepares the briefing venue and hires catering services to provide meals for participants. The PEO invites the approved Coordinators, Invigilators and Heads of practical, and Principals of Health Training Institutions to attend the briefing meeting. He also prepares appointment letters for the Coordinators, Invigilators and Heads of practical.

The Executive Secretary identifies and invites the Guest of Honor to officiate the briefing meeting. He also invites Board members to attend the briefing meeting. Invited participants report at the venue and register in the visitors' book and attendance list. The PAO, PEO, ES, Chairperson Examinations Committee, Chairperson Board and Guest of Honor address participants respectively. The PEO reads the list of participants and their respective deployment stations. The PEO issues Coordinators bags to respective center Coordinators. The Catering Officer serves lunch and refreshments to participants. The Accountant issues allowances to participants.

### **Management of School Based Assessment results (SBAs) from the schools;**

In this task, examinations centers conduct continuous school-based assessment (SBA) following curriculum guidelines and semester regulations for UAHEB. UAHEB takes responsibility to monitor the processes of SBA though this is always not done instead schools conduct assessment according to their convenience, compile results and submit to UAHEB. One of the examination officers lamented about the inability of UAHEB to actively monitor the conduct of SBA when stated that *“some centers assess candidates by administering fifteen (15) multiple choice questions to constitute 15% score that is expected of SBA, and yet we claim to be implementing the CBET curriculum”* *“worse than this some schools even do not administer SBA and just generate scores and yet most practical competences can only be assessed formatively”*. The PAO communicates the deadline for submission of SBA to the Secretariat, develops the SBA receiving form and assigns a staff in her department to take charge of receiving SBA, and obtains a record book from the store. The PEO sends SBA recording templates to examinations centers for use during entry of compiled trainees’ SBA results. Examination centre Staff lead by the Academic Registrar compile SBA results and computes scores out 15% per course unit per candidate for each class and avails compiled results to trainees and instructs them to check their respective results and thereafter sign against individual results.

The Academic Registrar endorses signed results and the center Principal approves them for submission to the Board. The Principal or Academic Registrar submits the original and photocopy of results to UAHEB and these are received by the staff identified to receive SBA. On receiving the results, the staff verifies them for completeness, registrar and principals’ signature as well as candidates’ signatures. He/she stamps on the both the UAHEB and examination center copy to confirm reception of the submitted SBA results. The center is urged



to keep the stamped copy safe for future reference. He/she files the received results, He/she hands over the filed results to the data entrant assigned to handle the program.

### **Administration (Conduct, management and supervision) of the examination;**

This task is entirely executed from the examination centers/training institution and it involves great collaboration between training institutions and UAHEB as well other temporarily appointment stakeholders to take the various roles. Both theory and practical examinations are conducted. A three hour theory examination is conducted per course unit where as a 50 to 75 minutes single general practical is conducted per class except for finalist candidates in their final semester.

The Principal of the examination center briefs candidates on examination rules and regulations to be observed in accordance with the timetable. This is done two days prior the actual start of examination conduct. He/she also declares end of teaching on the briefing day to candidates and tutors, prepares examination space and seating facilities in accordance with the examination guidelines and declares the examination space out of bounds to candidates and tutors.

The Coordinator and invigilators report to the police at 7:00am to pick examination materials for use on a daily basis for the entire examination period. They introduce themselves to the O.C police station to be allowed access to the examination materials. The Coordinator checks the examination bag to ensure that it is properly locked and identifies the day's examinations on the timetable, picks and signs for them on a special form. He/she then locks the examination bag and keeps the key. The center assigned driver transports the Examination Officials and materials to the examination center. The Coordinator meets the Principal and Examiners of practical for a briefing. The Coordinator and invigilators then inspect the examination space for proper arrangement of seats and absence of non-authorized material.

On the first day of examination conduct, the Principal calls candidates to assemble for a briefing by the Coordinator and Invigilators. Before entering the examination room, candidates are checked by the Invigilators and then allowed to enter the examination hall and sit as per the prescribed arrangement. Invigilators distribute answer booklets to candidates. The Coordinator gives the examination envelope to two candidates to verify the sealing and that it is the scheduled examination as per the timetable. The Coordinator opens the envelope and the Invigilators verify the examination and number of enclosed question papers. The Coordinator writes details of the examination on the writing board provided within the examination room. Invigilators distribute question papers to candidates.

The Coordinator declares examination start time and candidates start attempting questions. Invigilators monitor candidates throughout the examination to ensure that candidates do not cheat. Invigilators look out for emerging issues among candidates during the examination and address them appropriately. They also periodically remind candidates of the time left and ensure candidates sign on the attendance list. The Coordinator declares end of examination time and candidates stop writing. Invigilators collect answer scripts and question papers. Invigilators count scripts to compare the number with the attendance list. Invigilators pack scripts and attendance list in a return envelope and label appropriately. The Coordinator seals the return envelope witnessed by the candidates and the Principal. The Coordinator allows candidates to move out of the examination room. Invigilators check the examination room for any un-authorized materials, used or un-used answer booklets. The Coordinator locks the examination hall and keys the key.

Examination Scouts and Supervisors make impromptu visit to the examination center to assess examination progress and take any necessary measures. The Examination scouts and Supervisors compile reports about the examination progress and submit them to the Secretariat.

For practical examination, candidates are marked as they perform the skills required. However, due to large number of candidates in most schools and inadequate practical materials, candidates do more of writing stations than performance ones.

The Assigned Driver transports the Coordinator, invigilators and examination materials back to police. The Coordinator signs for the returned examination materials. The Coordinator packs returned examination envelopes into the bag and securely locks it. The Coordinator and invigilators compile a report detailing conduct of the examination.

**Return of examination materials;**

This is a responsibility of the Secretariat to pick candidates' answer scripts and other examination materials from the various police stations back to secretariat. The Secretariat's Head of drivers proposes return routes to the PEO who reviews it and approves. The PAO prepares release letters for police to authorize release of examination materials. A Secretariat staff and driver pick facilitation allowance from the Accountant. The Secretariat staff picks the release letter from the PAO and sets off with the driver to the police to collect examination materials. The Secretariat staff presents the release letter to the O.C. police station and appropriately identifies him/herself to police. The OC police station and the Secretariat staff sign on the release letter respectively. The OC police station releases the examination materials to be returned to the Secretariat Headquarters. The staff and Driver collect the examination scripts in the locked bag and question papers in a sac.

The Driver and Secretariat staff bring the examination materials back to Secretariat office and hands them over to the Stores Assistant keeps the returned examination materials in the temporary store. The Coordinator returns to the Secretariat a bag containing the report, examination bag key and other materials given him/her at the start of examinations. The

Coordinator submits a written a report about the examination exercise to the Principal Examination Officer.

**Transporting Candidates’ answer scripts to the marking centres;**

The Examination department staff, the Stores Assistant and other hired manpower open the examination bags from various examination centers one by one and sort scripts envelopes according to course units. Examination Officers and Stores Assistant pack the sorted the script envelopes in sacks and label them. The Stores Assistant records the number of scripts envelopes returned in Return forms. An assigned Driver and the Stores Assistant transport packed scripts envelopes to the store at the marking center.

**Preparations for marking of candidates’ answer scripts;**

In this task, the Procurement Officer ensures procurement of the marking venue. The PEO requisitions for materials to be used at the marking center e.g. colored pens, photocopying and ruled paper, sampling machines & wires, markers, calculators, and markers’ tags. He also requisitions for money to cater for Emergency medicines, out of pocket and transport refund, per-diem, fuel, security officer allowance and any other miscellaneous events. The E.S identifies a Guest of Honor to officiate at the opening of the marking exercise. The Examination Officer proposes Checkers, Markers for specific course units, assistant Chief Markers and Chief Markers to the PEO who compiles a list and submits it to the Examinations Committee for approval. The PEO invites the approved Checkers, Markers, Assistant Chief Markers and Chief Marker. The PEO and Procurement Officer Visit the site to assess suitability of the hired marking center. Secretariat staff, Checkers, Markers, Assistant Chief Markers and chief Marker report at the marking center and booking in on the agreed date.

### **Development of marking guides (lubrics);**

The PEO and PAO orient markers on the exercise proceedings. The PEO issues appointment letters to the participants (Checkers, Markers, Assistant Chief Markers, Chief Marker and Marking Centre Supervisors). Participants take the UAHEB oath of secrecy and sign. Markers are then grouped in teams according to their areas of specialty and a team leader and secretary are identified by each team. The Team leader picks pens, paper, question paper and calculator from the Secretariat table for his/her team. Markers in their teams develop marking guides for specific course units with supervision of the Assistant Chief Markers and Chief Marker. The Secretary of each group submits the draft marking guide to the Assistant Chief Marker and Chief Marker for approval. The Approved marking guide is then duplicated so that a copy is kept in chief markers file for reference and the other copy given to the examiners

### **Marking of candidates' answer scripts;**

The team leader picks a scripts envelope, opens it, counts the scripts, verifies and records the number of scripts in the picking book in the store. He/she submits the attendance list from the envelope to the Stores Assistant and delivers the scripts to the team for marking. Team members mark the scripts using a Conveyor Belt System (CBS), whereby each candidate's script is marked by all the team members with each marking a specific area. Markers count and enter the scores for each part appropriately on the cover page of the script. A team member enters candidates' scores into the score sheet and then all team members verify the scores and sign against them. The team leader packs the marked scripts into the envelope, picks the attendance list and staples it with the score sheet, then submits it with the envelope containing marked scripts to the Checkers.

Checkers look out for any un-marked work in the scripts and computational errors. After the verification, the Checkers submit the scripts, score sheets and attendance list to the Assistant Chief Marker. The Assistant Chief Marker cross-checks the marked scripts for accuracy and consistency in the marking and then submits marked scripts, score sheets and attendance lists to the Chief marker. The Chief Marker looks out for; general performance of candidates, any skewed results, samples out scripts for candidates with skewed scores and analyses them to identify the cause if any, evidence of malpractice. He/she then submits the marked scripts, score sheet and attendance list to the Data Entrants. The Data Entrants enters candidates' scores into an excel sheet on the computer.

#### **Data entry, Checking and Verification of processed Scores;**

The Data Entrant Computes end of semester score out of 85%, School-Based Assessment score out of 15% and generates a total score by adding the End of Semester score and the school-based assessment score. He/she then prints a copy containing the entered final score (out of 100%), computed end of semester score (out of 85%), school-based assessment score (out of 15) and the total score (100%) and submits the printed copy of results to Checkers.

Checkers cross-check for the number of candidates per examination center and scores entered per candidate using the Markers score sheet and students' attendance list. they submit the copy with the changes to the Examination Officers for verification. The Examination Officers verify the changes and submit the copy to the Data Entrant to make necessary adjustments. The Data Entrant make recommended changes and print new copies. The Data Entrant submits the printed copies, the checked copies and raw score sheets to the Principal Examinations Officer.

### **Identification and Management of suspected cases of examination malpractice;**

The Principal Examinations Officer analyzes examination field reports to identify suspected cases of examination malpractice and submit record of suspected cases with the respective evidences to the PEO. The PEO compiles available evidence and makes a list of suspected cases of examination malpractice which he submits to the Executive Secretary who in turn examines available evidence and refines the list of suspected cases of examination malpractice. The ES invites the Examinations Security Committee (ESC) of the Board to conduct a fair hearing to the suspected candidates, and the candidates and Principals of examination centers of suspected cases of examination malpractice to attend the hearing.

The ESC members, Candidates and Principals of examination centers suspected of malpractice turn up on the scheduled date for a hearing. The ESC attends to, discusses and makes recommendations to the board about the verdict per suspected case of examination malpractice. Later, the ES invites Board members to attend a board meeting. The board members discuss and make a verdict for each suspected case of examination malpractice. The Secretary Board communicates the verdict to the concerned candidates of examination malpractice.

### **Presentation of results to the Examinations committee of the Board;**

The ES invites the Examinations Committee (EC) members to discuss the candidates 'results. Prior to this meeting, the PEO analyses the candidates' score per course unit and examination center and compiles a report. He also prepares the report of the examination processes undertaken starting from the last time the committee sat highlighting observations and challenges.

On the meeting day, the PEO on behalf of the Executive Secretary (ES) presents a report of candidates' performance per course unit and examination center to the Examinations

Committee of the Board. The EC discusses the results, proposes recommendations and forwards them to the Board for approval. Thereafter, the PEO prepares the report to the Board with due consideration of the recommendations made by the EC.

**Presentation of results to the Board;**

This task is a responsibility of the ES. The ES invites the Board members to discuss the candidates' results. PEO prepares the report of the examination processes undertaken starting from the last time the committee sat highlighting observations and challenges. PEO on behalf of the ES presents the summary of candidate's performance by use of tables, graphs and narratives with amendments recommended by the Examinations Committee. The Board discusses the candidates' results, makes decisions and approve them for release to the respective examination centers; For preliminary (semester one or for continuing students) results, the Board instructs the ES to release Approved results to respective Allied Health Training Institutions whereas for Final (end of course) results, the Board authorizes the ES to print results to be presented to the Minister responsible for Education and Sports who collaboratively work with the Board to release the results to the Public.

**Release of candidates' results;**

This depends on whether the results for release are preliminary (for continuing students) or final (end of program results);

**Release of preliminary results involves the following subtasks;**

The Executive Secretary signs printed copies of approved results and hands over a copy of the approved results to the administrative secretary for photocopying. The Administrative Secretary files a photocopy of the approved results and seals the original copies in an envelope labelled for respective centers and invites Principals or academic registrars to pick results for



their respective centers. The Principal or Academic registrar picks the copy of results from the administrative secretary and signs for them.

**End of program (final results) release involves the following steps;**

Here, the Executive Secretary seeks appointment with the Minister of Education and Sports to presents results for release. The Minister of Education and Sports invites the Board for briefing about the results. The Procurement Officer hires services for printing and binding copies of the final results of End of Course Examination Results. The printing service providers print and bind results in four duplicate books; one for the ministry, one for the ES, one for Allied Health Professionals Council and another for Examinations department. The Executive Secretary invites important stakeholders (Board members, Principals of examination centers, Allied Health Professional council members and some trainees) to attend the release of results. The Minister of Education and Sports releases the results during a public ceremony attended by officials from; Ministry of Education and Sports, Professional councils, training schools, sister examination Boards, Board members, Secretariat Staff among others.

**Giving examinations related feedback to stakeholders;**

This is the last step of the cyclic process that UAHEB undertakes every semester to assess trainees. The following steps are involved; The Executive Secretary Invites Principals and Academic Registrars to attend the feedback workshop. The PEO prepares a presentation on the processes of assessment, their strength and weakness, summary of candidates' performance for presentation to stakeholders. He also requisitions for allowances for invited participants and Secretariat Staff. The procurement officer ensures procurement of the venue. The invited members report to the venue on the scheduled date. The ES, and Chairperson Examinations Committee of the Board officiate the workshop. The PAO presents feedback on the processes of examination preparations, conduct and marking while the PEO presents feedback on performance of candidates. Thereafter, participants discuss either in a plenary or

in groups according to programs and lastly, they share ideas and a way forward to be presented to the Board is written.



**Figure 3: Some UAHEB staff in a Discussion during Problem Analysis.**

Following the democratic principal of action research, the identified and analysed steps were democratically categorized basing on whether they influence content in the assessment or not. In this categorisation, four (4) steps were identified to be directly influencing the nature of content in the assessment, namely: Setting of Test Items [1], Moderation of Set Test Items [2], Question Paper Development [3] and Administration of the Examinations [4].

In order to choose one step that critically influenced the nature of assessment, The four (4) steps were ranked using pair-wise matrix of ranking. Setting of Test Items which accrued the highest scores of 3, was ranked as the most significant influencing factor of the nature of assessment by the Board as shown in Table 2: below.

**Table 2: Pair-wise Rank Matrix for Most Influencing Factor on Nature of Assessment**

	1	2	3	4
1		1	1	1
2	1 = 3 2 = 2		2	2
3	3 = 1 4 = 0			3
4		Highest: 1 [Setting Test Items]		

Setting of test items, which accrued the highest score, was identified as a critical step of concern that needed to be addressed.



**Figure 4: Participants during a Group Discussion**

#### **4.2 Strategies for Enhancing Practical Content in Assessment**

The future workshop was used as a method of data collection to explore the strategies for enhancing practical content in assessment of clinical officer trainees at UAHEB. Stakeholders identified setting test items as a critical step affecting the nature of content in UAHEB assessment. The identified area of concern (step) that is setting of test items was explored in the three (3) phases of the Future Workshop (i.e. critical, fantasy and reality phases).



**Figure 5: Screenshot of the invitation message to the future workshop**

In the critical phase, participants brainstormed on the reasons for setting theoretical test items for DCM trainees. A list of sixteen (16) responses was generated and these were; inadequate funding by UAHEB for practical examinations preparation, inadequately skilled setters to set practical test items, inadequate materials for training practical skills at the training institutions, it has turned into a norm for assessments to be theoretical for convenience purpose, there is limited time for setting practical test items for assessment, there is a big number of trainees in institutions which makes practical assessment cumbersome, there are unreliable examiners of practical examinations, some course content can only be assessed theoretically, a combined general practical for all the course units per class limits the content per course unit,

inadequate examiners of practical examinations, inadequate space to conduct practical examinations both in training institutions and the hospitals, lack of standardized environment for practical examinations, few teaching hospitals to conduct practical examinations, lack of blue prints to be followed when setting test items, setters not following the curriculum while setting test items, and no appropriate criteria for selecting practical examiners.

After participants had listed all the possible causes for setting theoretical test items instead of practical ones, each of the reasons given was further explored to establish the route cause. The following were the participants views on each of the reasons given.

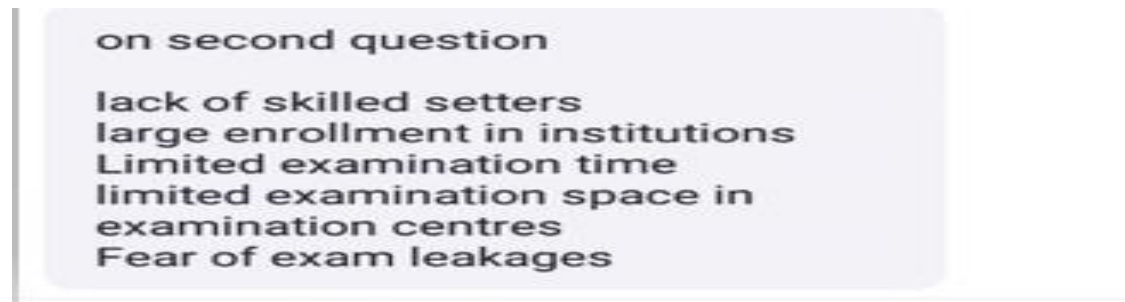
#### **Inadequate funding by UAHEB for practical examinations preparation;**

The inadequate funding for practical test item preparation was identified as one of the reasons for setting theoretical questions. One of the participants explained that it was impossible to set valid practical test items with the necessary requirements, as well the scoring guide to cater for all candidates with the limited financial resources allocated to practical preparation by UAHEB. He further narrated that; one needs to visit the practical sites to establish updates in skills practice since most setters are not actively practicing. Thereafter, he/she relates field experience with the curriculum content, get to know the available resources, number of candidates, and human resource to cater for the smooth conduct of the examinations otherwise all the efforts made to set practical test items may be wasted. Another participant stated that “*increase funding for setting to increase time for setting*”.

#### **Inadequately skilled setters to set practical test items;**

It was noted that due to the transfer of health worker training and assessment to ministry of education, most tutors employed in training institutions do not actively engage in clinical practice and in the long they too become theoretical health tutors. Also, many of the tutors do not attend continuous professional development programmes due to poor motivation instead

spend most of their times running from one school to another to earn a leaving. One participant questioned “*how can a theoretical tutor set practical test items*”. “*The tutors who are setting, themselves are not practicing and there is no way they can set practical questions, there is inadequate innovation in setting of practical questions*”, another setter stated.



**Figure 6: Screenshot of a Stakeholder’s Comment on causes of setting theoretical questions in the critical phase of the future workshop**

**Inadequate materials for training practical skills at the training institutions;**

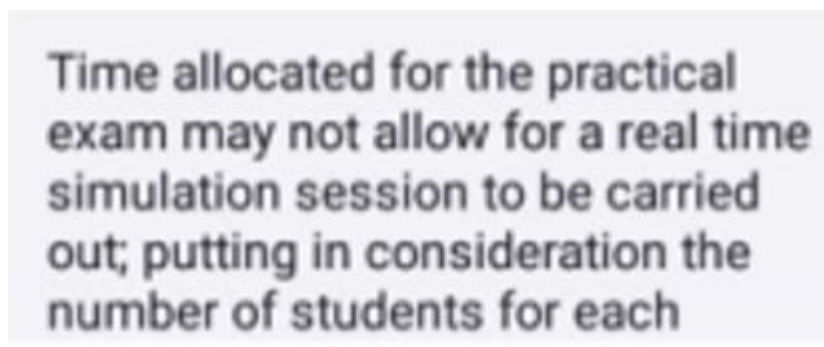
Members lamented that most training centers have limited practical materials and this greatly limits setters from setting practical test items. This is due to the fact that as setters make plans to set practical test items, they make reference to their own workplaces and they end up limited to set tasks that can be accomplished using the materials that exist in their centers. *Most setters are also compromised in their setting for they also consider the situation in their schools which in most cases are poorly stocked or resourced*”, one participant narrated. “*Though I am a good tutor for reproductive health, and I know how carrying out uterine evacuation using Manual Vacuum aspiration to complete an abortion is lifesaving, how can I set such a task yet in my school we don’t have even a single one?*” another asked.

**It has turned into a norm for assessments to be theoretical;**

One senior citizen participant narrated that since the inception of UAHEB, a number of changes have been observed in assessment of clinical officers until it has now taken course to become part of culture. It is now difficult to differentiate between practical and theoretical assessment apart relying on the examinations cover page. He further exclaimed *“how can a practical examination take shorter time than theory and you still call it practical! yet we are expected to spend two-thirds of the teaching time covering practical content”*. This culture has pushed us to concentrate on theory both in teaching and setting exams.

**There is limited time for setting practical test items for assessment;**

Participants urged that the time allocated for setting of test items is always limited yet setting practical test items require ample time for one to develop a valid practical scenario. This limited time hinders the Setters' concentration to simulate and set test items that bring reality closer to the candidates. Instead, Setters set theoretical test items and just make marking guides in the format of a checklist and label these practical test items.

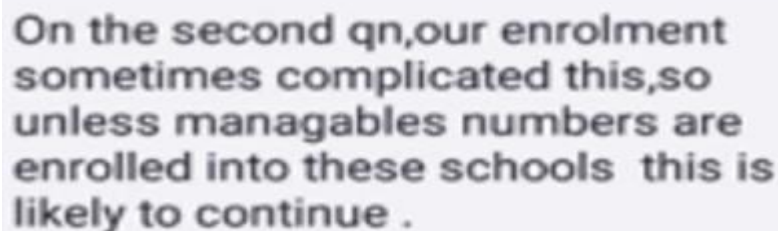


**Figure 7: Screenshot of a Stakeholder's Comment on limited time leading setting theoretical questions**



**There is a big number of trainees in institutions which makes practical assessment cumbersome;**

Participants elaborated that the large numbers of candidates in some centers highly affect the nature of test items set. Basing on the previous experience of conducting OSCE/OSPE assessment where some centers would conduct assessment past midnight as all candidates were to perform same tasks, each taking specified period of time, and with an examiner observing to score. This experience led to the stakeholders resorting to setting either practical test items that can be accomplished in a very short time or theoretical test items in practical examination. One of the participants posed a question “*can 150 candidates be offered pregnant mother to examine on the same day?*”, she added, *unless trainees’ numbers are controlled in schools, it will remain impossible to set and conduct practical examinations*”. *The numbers are huge and resources both human and practical equipment are very few*”, another participant explained.



On the second qn,our enrolment sometimes complicated this,so unless managables numbers are enrolled into these schools this is likely to continue .

**Figure 8: Screenshot of a Stakeholder’s view on large numbers leading to setting questions that are more theoretical**

**There are unreliable examiners of practical examinations;**

Under this reason, participants elaborated that practical test items are only valid if the examiners are reliable. Due to the fact that many clinical skills that can be assessed practically require the candidate to perform a task and is being observed and scored by the examiner and do not record to serve as evidence, the candidates score is examiners biased. An examiner who is subjective automatically awards unreliable results. One participant noted that it is very

common to find candidates in a center passing a performance task with good scores and yet when the same is set in a theory exam, they fail, clear evidence that the scoring in the practical was unreliable.

### **Some course content can only be assessed theoretically;**

Some participants stated that the course units they teach do not have practical content to assess. A case in point was entrepreneurship and medical psychology. They narrated that such course units do have performance competences in the curriculum and hence including such course units in practical examinations would automatically lead to setting theoretical questions. *“Some course units may dictate the nature of questions”*, a participant stated.

### **A combined general practical for all the course units per class limits the content per course unit;**

It was noted by participants that format of preparing and administering a single general practical for all the course units per class per semester, was contributing greatly to the setting of theoretical test items.

### **Inadequate examiners of practical examinations;**

Participants gave reason that due to the limited number of competent practical examiners available in training institutions, setters prepare test items bearing in mind that there few human resources available to man administration of practical examination. With this, setters prefer setting theoretical test items in practical examination commonly referred to as writing stations to mitigate the likely crisis of inadequate practical examiners. This is so because the theoretical questions do not often require fulltime presence of the examiners as the candidate undertakes the examination but rather require marking after the candidate has written. A participant wrote

*“with past experience where examinations would go up to midnight, we can’t risk setting only practical test item”.*

Other causes highlighted were; inadequate space to conduct practical examinations both in training institutions and the hospitals, Lack of standardized environment for practical examinations, Few teaching hospitals to conduct practical examinations, Lack of blue prints to be followed when setting test items, Setters not following the curriculum while setting test items and no appropriate criteria for selecting practical examiners.

Participants also brainstormed on the effects of setting theoretical test items for the assessment of Clinical Officer trainees. Their responses were outlined as below;

- i. Passing out unskilled health workers
- ii. Increase in examination and medical malpractice
- iii. Unemployment
- iv. Loss of public trust in the profession and eventual collapse of the program

**lack of trust in clinical competence; the trainees over time don't develop the expertise to perform hands required clinical skills.**

**From Serugo Isaac Iuweero soco to Everyone**

**long term effects would be misdiagnosis, wrong or poor management of patients leading to either complications disabilities and probably death. Poor client satisfaction. The nation will then try to investigate our curriculum and its implementation.**

**From Asea Emmanuel to Everyone**

**It will lead to phasing out of the program because in long run they be deemed completely incompetent**

**From MUBANGIZI PROSPER to Everyone**

- 1. Incompetent clinician in the field of practice**
- 2. Loss of trust in the professionals and the exam body because the professionals would not meet the expectations of their customers" the patients"**
- 3. More pressure to the body from stake holders to review the training of clinicians**
- 4. Wastage of resources as there will be need for internship or retraining**
- 5. Loss of trust to the tutors who train these professionals that cannot respond to societal needs**

**Figure 9: Screenshot of Stakeholders' views on the consequences of setting more theoretical questions**

In the fantasy phase, reasons for setting theoretical test items were analysed and participants converted these reasons into dream points. Generated dream points were listed down to constitute an idea store as shown below:

- 1) There is adequate funding by UAHEB for practical examinations preparation
- 2) There are adequately skilled setters to set practical test items
- 3) There are adequate materials for training practical skills at the training institutions
- 4) Setters have a culture to set practical test items for assessment
- 5) There is enough time for setting practical test items for assessment
- 6) There is a manageable number of trainees in training institutions.
- 7) There are reliable examiners of practical examinations
- 8) There is practical course content in the curriculum to be assessed.
- 9) There is a separate practical examination for each course unit taught
- 10) There are enough examiners of practical examinations
- 11) There is adequate space to conduct practical examinations both in training intuitions and hospitals
- 12) There is a standardized environment for practical examinations
- 13) There are enough teaching hospitals to conduct practical examinations
- 14) There are developed blue prints to be followed when setting test items
- 15) Setters follow the curriculum while setting test items
- 16) There are appropriate criteria for selecting practical examiners

In the reality phase, participants based on the approximated duration required to achieve the dream points to cluster the points in the idea store into long term (more than a year), mid-term (6 – 12 months) and short-term (less than 6 months). The aim was to identify short-term dream points that could be transformed into actionable points for implementation within six

(6) months. The long-term dream points were five (5) and they were; there is adequate funding by UAHEB for practical examinations preparation, there are adequately skilled setters to set practical test items, setters have a culture of setting test items, there reliable examiners of practical, and there is practical content for each course unit in the curriculum to be assessed. The mid-term dream points were two (2); there is a manageable number of trainees in the training institutions and there is adequate space to conduct practical examinations in training institutions and hospitals.

The short-term dream points were nine (9) which are; there is a separate practical examination for each course unit, there is a standardized environment for practical examinations, there are enough examiners for practical examinations, there is enough time to conduct practical examinations, there are adequate materials for training practical skills at the institutions, setters follow the curriculum while setting test items, there are developed test blue prints to be followed when setting test items, there is enough time for setting practical test items for assessment, and there is appropriate criteria for selection of setters. The nine (9) points that were identified as short term were labelled as A- I as indicated below;

1. There is a separate practical examination for each course unit [**A**]
2. There is a standardized environment for practical examinations [**B**]
3. There are enough examiners for practical examinations [**C**]
4. There is enough time to conduct practical examinations [**D**]
5. There are adequate materials for training practical skills at the institutions [**E**]
6. Setters follow the curriculum while setting test items [**F**]
7. There are developed test blue prints to be followed when setting test items [**G**]
8. There is enough time for setting practical test items for assessment [**H**]
9. There is appropriate criteria for selection of setters [**I**]

The short-term dream points were then ranked according to feasibility to identify one that could effectively be implemented to produce the desired results.

Using the Pair wise matrix of ranking, participants selected using a test blue print in setting UAHEB examinations (**G**) which accrued the highest score (8) as the most significant strategy to enhance practical content in the assessment of Clinical Officer trainees as shown in Table 3: below.

**Table 3: Pair-wise Rank Matrix for the most Significant Strategy**

	A	B	C	D	E	F	G	H	I
A		A	C	A	A	F	G	A	A
B			C	D	E	F	G	H	I
C	A = 5			C	C	F	G	C	C
D	B = 0				E	F	G	D	I
E	C = 6					F	G	H	I
F	D = 2						G	F	F
G	E = 2							G	G
H	F = 7		<b>Highest Score G: 8</b>						I
I	G = 8		<b>Using a test blue print in setting</b>						
	H = 2								
	I = 4								

Through the brainstorming method, participants explored the reasons for setters not following a test blue print while setting test items for assessment of Clinical Officer trainees. Four (4) reasons were identified as; absence of developed test blue prints, inadequate supervision during setting, limited time for setting and setters not understanding the use of a blue print in setting test items.

Participants discussed and proposed solutions to the above challenges that contribute to setters not following test blue prints while setting test items for assessment. These were:



- i. Identifying technical persons in specific course units to be trained and facilitated to develop test blue prints.
- ii. Identifying experienced setters to support UAHEB Examination Officers in the supervision during setting of test items.
- iii. Identifying a team of technical/ Chief Setters to moderate set test items
- iv. Setting up independent setting teams, each supervised by a chief setter
- v. Combining setting of test items with moderation.
- vi. Increasing the number of days for setting
- vii. Organizing days for developing test blue prints separate from those for setting test items
- viii. Organizing a special workshop for developing test blue prints
- ix. Assigning each setter to develop a blue print, test items and their rubrics.
- x. Training setters on how to develop test blue prints

#### **4.3 Implementation of Strategies for Enhancing Practical Content in Assessment**

The implementation phase involved; Orientation on development and use of a test blue print, Development of test blue prints, setting test items with their rubrics using developed test blue prints, Moderation of set test items and rubrics using test blue prints and question paper development.

##### **4.3.1 Orientation on development and use of a Test Blue Print**

A training workshop on the use a test blue print to set test items was organised. An invitation message was sent to participants.



**Figure 10: Screenshot of the Invitation message to the implementation workshop**

The participants included experienced trainers and practitioners in the different clinical specialities who had participated in the future workshop and they were invited to be trained as Chief Setters this took place on day one of the workshop. Regular setters from the different training institutions and were also invited to be trained as setters. Facilitators of the training workshop included the researcher, expert on test blue print and Head of Examinations Department at UAHEB. The workshop was also attended by two Research Supervisors, a mentor and three UAHEB examination officers.



**Figure 11: Researcher giving a presentation on the development and use of a test blue print in setting examination during the implementation workshop**

#### **4.3.1.1 Developing a Test Blue Print**

On day two of the workshop, a recap on previous presentation was done first. One of the facilitators then oriented participants on the use of the Miller's pyramid as a preferred model focusing on practical content in assessment.

Every team was provided with the relevant curriculum content. Team members democratically graded the content between 1 and 3 based on relevance and repetitiveness of the curriculum content to professional practice of a Clinical Officer. The product of the two attributes constituted the significance of that content in the blue print. Content with the highest significance scores (9 and 6) were classified as MUST KNOW (Essential) and these were considered to fall in the either of the two top most levels of Millers Pyramid (i.e. DOES and

SHOWS HOW) and therefore highly emphasized during the assessment. The medium score (4 and 3) content was classified as NICE TO KNOW (Necessary) and these were clustered to fall in the second bottom level of Miller's Pyramid (i.e. KNOWS HOW) and those with least scores (2 and 1) were classified as GOOD TO KNOW (Relevant) and these fell in the bottom level of the pyramid (i.e. KNOWS of Knowledge).

Participants were then grouped into teams according to speciality, each supervised by a trained Chief Setter. Team members aligned the curriculum content with appropriate questioning verbs based on the allocated score to form a blue print. The team supervisor/ Chief Setters validated the developed test blue prints hence making them ready for use in test items setting process.



**Figure 12: Participants Developing Test Blue Prints**

#### 4.3.1.2 Setting using a Test Blue Print

On Day three, a review of UAHEB setting guidelines was done to update participants on the required UAHEB sets of test items. This was to be observed as members set the various test items following their respective validated blue prints. Each team member independently set test items covering all the levels of the Miller's Pyramid following the developed blue print for his/her course unit of specialisation. Each member also developed a rubric (marking guide) for all the developed test items.



**Figure 13: Participants Setting Test Items**

### 4.3.2 Moderation of set Test Items

Moderation of set test items was done concurrently with the setting. Chief setters used the validated test blue print to qualify test items and their rubrics. A typist was hired to type the validated blue prints, test items and their rubrics.



**Figure 14: A chief Setter giving instructions on moderation of test items**



**Figure 15: Researcher, Supervisor and participants after Training, Setting and Moderation Workshop**

#### **4.3.3 Question Paper Development**

The researcher and two selected expert Health Tutors organised moderated test items to constitute a question paper for each course unit taught in the semester in accordance with UAHEB guidelines. This was done at the UAHEB Secretariat. They also proof read the questions to eliminate any errors and ambiguity in the questions prior submitting them for duplication. Question papers were printed, packed and made ready for administration to the candidates.

#### 4.4 Effects of Using a Test Blue Print in Setting UAHEB Assessments for Clinical Officer Trainees

The effect of using a test blue print in setting UAHEB assessments for Clinical Officer trainees was established based on the difference in practical content in the assessment and stakeholders' satisfaction with the assessment and hospital placements.

##### 4.4.1 Practical Content in UAHEB Assessment of Clinical Officer Trainees

After administrations of the assessment, question papers were analysed to determine the proportion of practical content they contained. Results are presented in Table 4 below.

**Table 4: Composition of Practical Content in UAHEB Assessment after Using a Test Blue Print in Setting.**

Assessment	Expected [%]	All Years [%]	First Year	First Year
			Before [%]	After [%]
General	65.0	40.7	38.5	<b>52.5</b>
Theory	60.0	37.3	34.9	<b>43.3</b>
Practical	100.0	79.0	78.0	<b>80.0</b>

There was a general increase in practical content in the assessment from 38.5% to 52.5% when a Test Blue Print was used in setting test items for the assessment of Clinical Officer Trainees at UAHEB.





**Figure 16: An Examiner and a Candidate during an OSCE/OSPE Assessment**

#### **4.4.2 Stakeholders' Satisfaction with UAHEB Assessment and Hospital Placements for Clinical Officer Trainees**

A semi-structured questionnaire was used to assess candidates and Health Tutors/ Examiners' perceptions towards the assessment after a test blue print was used to set test items. Majority (80%) of the candidates attempted all the questions in the assessment. All candidates and Health Tutors/ Examiners reported that all the questions in the assessment were set within the semester curriculum content. *"We had studied but the time was limited to understand the work,"* One of the students responded.

Much as all the Health Tutors/ Examiners believed that all the questions in the assessment were simple, all the candidates reported that the questions were difficult.

Candidates cited forgetting, inadequate mastery of content and inability to interpret some of the questions in the assessment as reasons for the perceived difficulty.

All the Health tutors/ Examiners reported that candidates had not gone for hospital placement due to Covid-19 restrictions and short duration of the semester. On the other hand, some candidates (40%) reported to have attended hospital placements during the semester. Although many candidates reported non-scheduling of the activity by schools as the reason for their non-attendance of hospital placement, circumstances are still unclear under which some of the candidates would have attended the placements. *“Hospital placements were not on the semester program,”* and *“There was too much class work to cover and so we couldn’t find time to go for hospital placements,”* some students noted.

All Health Tutors/ Examiners believed that hospital placements were relevant to attempting the assessment as opposed to only 60% of the candidates who believed so. Candidates reported that assessments did not contain clinical conditions that are encountered in the hospitals. All the Health Tutors/ Examiners reported that questions in the assessment were closely related to challenges expected to be encountered in the world or work as compared to only 40% of the candidates who believed so.

Among other concerns, candidates proposed UAHEB to supervise hospital placements and demand written reports from schools to promote adherence to training requirements and to eliminate or reduce on the number of writing stations in the General Practical examination.



**Figure 17: Examiners scoring Candidates' scripts at the Marking Centre**

## **CHAPTER FIVE: DISCUSSION, CONCLUSION AND RECOMMENDATIONS**

### **5.0 Introduction**

This chapter presents discussion, conclusion and recommendation. Discussion follows the following: Practical content in the assessment of Clinical Officer Trainees, Strategies for Enhancing Practical Content in the Assessment of Clinical Officer Trainees and Impact of Using a Test Blue Print in Setting Assessments for Clinical Officer Trainees.

### **5.1. Discussion**

#### **5.1.1 Practical Content in the Assessment of Clinical Officer Trainees**

A review of UAHEB examinations for the years 2016/17, 2017/18 and 2018/19 showed that the practical content in UAHEB examinations for clinical officers is 40.7%. This is lower than the 65% practical content required as reflected in the CBET curriculum for the diploma in clinical medicine and community health training program. Stakeholders were in agreement with this finding as they claimed that some of the course units could not be assessed practically. *“Some course units like those in first year are theoretical and cannot be examined practically,”* said one of the participants. *“Actually, they are the ones that cause writing stations in the general practical,”* said another. This result agrees with earlier claim by stakeholders that UAHEB assessment for clinical officers is largely theoretical. There is need therefore, to identify and implement strategies for increasing practical content in the assessment of clinical officers in UAHEB examination.

Practical content in UAHEB assessment was highest in third year and lowest in first year. This could be attributed to the nature of course units undertaken under different years of study. In the first year of study, trainees largely undertake biomedical courses like anatomy and physiology, medical psychology, microbiology, pharmacology and medical ethics to

enable them appreciate the concepts and principles in the medical field. Most examiners prefer assessing these theoretically to measure knowledge retention. In the second-year of study, candidates are exposed to specialised disciplines like mental health, ophthalmology, dental and oral health, ear, nose and throat care, reproductive health and palliative care. This is meant to enable them understand what happens in specific medical fields to facilitate them make appropriate referrals whenever necessary. In the third year of study, trainees undertake clinical courses like medicine, surgery, obstetrics and gynaecology, and paediatrics. These are intended to equip trainees with the required competences for practice in the world of work. Examiners tend to concentrate on clinical courses for practical assessment against other disciplines covered in the earlier years of study.

In the third year of study, each clinical discipline is assessed separately in practical examination compared to the earlier years of study where all the course units (usually 5-6) are combined and assessed in a single general practical. Each of the course units assessed in the general practical contribute one or two questions only to the assessment. This further limit the practical content assessed in these disciplines. The general practical contains both performance stations and writing stations.

Performance stations are constituted by questions that require a candidate to demonstrate, act or explain a concept or procedure to an examiner as is being scored. These stations require materials for use to be available and are manned by experienced examiners to make judgement on a candidate's performance. Writing station on the other hand are constituted by largely theoretical questions that require a candidate to remember learnt material. Candidates are provided with imaginary scenarios or questions for which they are required to respond to by writing on the provided record forms. Writing stations are often not manned but require marking and scoring candidates' written responses.

The goal of a health training program is to graduate professionals who can provide high quality patient care and assessments need to be accurate, informative and truly reflective of a trainee's performance (Louis-Jacques., 2021). Increasing practical content in assessment ensures that the outcome of assessment is reflective of what a graduate is capable of doing (performance). Evidence shows that gaps in clinical performance can persist into independent practice and speak to the quality of training received (Louis-Jacques., 2021). This implies that concentrating on theoretical assessment of clinical officer trainees would leave gaps in practical skills of professionals un-detected that would put patients under their care at risk.

### **5.1.2 Strategies for Enhancing Practical Content in the Assessment of Clinical Officer Trainees**

In this study, using a test blue print while setting test items in the assessment of Clinical officer trainees was identified as the most effective strategy to enhance practical content. This was because the idea of using a test blue print was not new and could easily be implemented with minimal resources and within the stipulated time. UAHEB had earlier on engaged examiners to use a test blue print while setting. Examiners were required to generate a test blue print for each of the examinations to be set. However, many if not all could not fulfil this requirement citing inadequate knowledge about development and use of the tool. *"They don't know what a blue print is so they cannot develop and follow it"*, said a participant.

Uganda Allied Health Examinations Board (UAHEB) on several occasions has hired examination experts to train Setters on the use of the test blue print but these trainings have not yielded much given that the experts hired were from UNEB (an examination body for basic education in primary and secondary) who use examples that could not easily be applied by health trainers. In those training workshops, emphasis has been on the Bloom's taxonomy

which focuses on cognitive power as opposed to psychomotor skills/practical skills (performance).

In this study Setters were trained by facilitators who were experienced health professionals with pedagogical competences. They explained the concept of a test blue print and made illustrations using examples relevant to the medical field. We used the Miller's Pyramid Model that emphasizes performance (doing) to design the test blue print as opposed to the Bloom's Taxonomy that concentrates on cognitive abilities.

Other scholars have reported simulation as an effective method for increasing practicality of assessment of health professionals (Cook, 2016). Clinical competence assessments using judgement-based methods are acceptable approaches of practical assessment of medical trainees (McGill & Vleuten, 2015). Another study in Malaysia, showed that Case write-up, logbook and observed long case were significant strategies for increasing practical assessment of medical trainees (Fong, 2012).

Several scholars have suggested other strategies like: real work experience, role plays (simulated work experience), clinic for counselling students, placements with agencies, project-based assessment, presentations, portfolio and case study of clinical/work experience (McDowell et al., 2011, Sambell et al., 2013). These are alternative approaches that could be used for assessment of trainee on practical skills. They can be supplemented rather than improving on the existing assessment approach.

According to Carless (2015), authentic assessment that encourages a greater depth of learning and requires students to apply their understanding to real-world tasks or settings (Boud, 2007; Sambell et al., 2013) is the ideal approach for assessing practical content among trainees. Authentic activities also promote student learning for the future (Boud, 2007; Carless, 2015; Gronlund, 2006; Hui & Koplun, 2011; Libman, 2010; Sambell et al., 2013; Trevalyn &

Wilson, 2012). These methods improve the development of specific skills, and critical thinking of learners (Oladele, 2011; Sambell et al., 2013).

Other scholars have argued that practical skills should be assessed through dedicated formative (school based) assessments to make sure that all the students acquire the required competencies as making practical assessment part of the of overall composite examination may not be effective in ensuring that all students have achieved the required level of competency (Elango & Jutti, 2007).

Recent trends in medical education emphasize gathering evidence of clinical competence and professional behaviour observed in clinical environments. In Miller's framework for assessing clinical competence, workplace-based methods of assessment target the highest level of the pyramid and collect information about health workers' performance in their everyday practice as opposed to a single summative assessment. It promotes active, learner-centred learning and facilitates provision of developmental verbal feedback to the trainee immediately afterwards (Liu, 2012). Assessment should form an integral part of curriculum design in higher education and should be robust enough to ensure clinical competence (Brits, Bezuidenhout & Merwe, 2020).

### **5.1.3 Effects of Using a Test Blue Print in Setting Assessments for Clinical Officer Trainees**

In this study, there was a general increase in practical content in the assessment of Clinical Officer Trainees at UAHEB from 38.5% to 52.5% when a Test Blue Print was used in setting test items for the first-year candidates of the diploma in clinical medicine and community health. This increase is remarkable given that course units in the first year of study (biomedical courses) are largely considered theoretical and examiners were just adjusting to using a test blue print during setting of test items. Further increase in practical content is



expected as a test blue print is used to set test items for the second and third years of study because courses in these years of study are largely clinical and specialized.

It should be noted that during assessment, practical competences vividly exhibit the relationship there is between theory and practice (Mjelde, 2006). Therefore, examination blueprinting achieve valid assessment of students through defining exactly what is intended to be measured, in which learning domain and defines what level of competence is required (Abdellatif, 2019).

Competence based assessment modes such as the Test Blue Print provided the students with opportunities to explore hands-on oriented experiences that contribute to knowledge retention and application. This was evidenced when one of the participants stated: “with this assessment following a test blue print, trainees will definitely have to practice in the hospitals.

Other studies have described blueprinting as a tool that helps to overcome disadvantages of essay questions like fewer number of questions, limited sampling, unfair distribution of questions over topics and vague questions by increasing the validity of examinations (Sunita Y Patil, Manasi Gosavi, 2015). Blueprinting helps to ensure alignment of the examination with course goals and objectives and assist in constructing multiple items (such as for a question bank) that differ, yet assess the same objective at the same level (Dutton, 2016). Other studies have showed that a blueprint describes the key elements of a test, including the content to be covered, the amount of emphasis allocated to each content area, and other important features (Mark R. Raymond, 2019).

A blueprint maps and specifies assessment items based on educational outcomes and supports the validity of assessment with regard to its content – content validity (Muhd Al-Aarifin Ismail, Mohamad Najib Mat Pa, Jamilah Al-Muhammady Muhamed, 2020). It

correlates student learning outcomes with the expected level of performance and the relative weight on the exam (Karin J. Young, Sarah Lashley, 2019).

There was a general increase in stakeholders' satisfaction with UAHEB examination when a test blue print was used in setting test items for the assessment of clinical officers. However, there was a variation in the degree of satisfaction between the tutors and the trainees. Health Tutors believed that the questions in the assessment were easy, within the scope of the curriculum and could easily be responded to if one attended hospital placement. On the other hand, candidates reported that questions were difficult given that they did not have adequate time to master content and disagreed with the need for hospital placement on the basis that the questions did not contain clinical conditions that are encountered in hospitals. However, both tutors and trainees appreciated the assessments when a test blue print was used to set test items citing those examinations contained content that is more frequently encountered in practice.

## **5.2 Conclusion**

This study sought to identify strategies for increasing practical content in the assessment of Clinical Officer Trainees at UAHEB. The practical content in UAHEB assessment for first of study of the diploma in clinical medicine and community health program was 38.5% before use of a test blue print in setting test items. Stakeholders identified using a test blue print in setting test items as an effective strategy for increasing practical content in the assessment. After the implementation workshop and administration of the assessment, practical content in the assessment of first year of study for the diploma in clinical medicine and community health increased from 38.5% to 52.5%. Stakeholders' satisfaction with UAHEB examination also increased as they reported that questions in the examination were those that are encountered more frequently in practice.

### **5.3 Recommendation**

Practical content in Uganda Allied Health Examinations Board (UAHEB) assessment for clinical officers is lower than recommended. There is need to emphasize practical content while setting test items for DCM trainees.

Stakeholders identified use of a test blue print in setting test items as a feasible strategy for increasing practical content in UAHEB assessment for clinical officer trainees. When a test blue print was used in setting test items, practical content in the assessment increased from 38.5% to 52.5 % which was remarkable. UAHEB should train and support examiners to develop and use Test Blue Prints in setting test items for the assessment of clinical officer trainees.

A Test Blue Print is an effective tool for increasing practical content in UAHEB assessment. Its use is also associated with increased stakeholders' satisfaction with assessment. UAHEB should adopt using a Blueprint in setting test items for all her programs.

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## APPENDICES

### APPENDIX I: INTRODUCTION LETTER.

  
**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**

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4<sup>th</sup> December, 2021

Executive Secretary,  
Uganda Allied Health Examination Board  
Kyambogo.

*Permission granted. She is highly welcomed to conduct her research at the organisation.*  
*[Signature]* 4/12/2022

Dear Sir,

**RE: INTRODUCTION OF KABASINGUZI VERONICA**

This comes to introduce to you KABASINGUZI Veronica a student of Masters in Vocational Pedagogy (MVP) Programme at Kyambogo University. This student bears registration

no.17/U/14848/MVP/PE and in her final year. In partial fulfillment for the ward of a Masters in Vocational Pedagogy Programme of Kyambogo University, This student is expected to conduct a workplace based Action Research with an aim of improving a specific situation within her workplace.

The purpose of this letter therefore, is to request you to allow Kabasinguzi Veronica conduct her Research at Uganda Allied Examination Board and accord her the necessary support for her study.

Looking forward to your usual support.

Yours Sincerely,

*[Signature]*

Chris Serwaniko

**Coordinator, Masters in Vocational Pedagogy Programme**



**APPENDIX II: INVITATION LETTER TO THE IMPLEMENTATION  
WORKSHOP**



**MINISTRY OF EDUCATION & SPORTS**  
**UGANDA ALLIED HEALTH EXAMINATIONS BOARD (UAHEB)**  
**P.O Box 22733, Kampala.**  
**Tel: 0414 690 221, 0414 289716**  
**Email: [uaheb09.go.ug/uaheb09@gmail.com](http://uaheb09.go.ug/uaheb09@gmail.com)**  
**Website: [www.uaheb.go.ug](http://www.uaheb.go.ug)**



**Ref: UAHEB/EXAM/01/22**

**Date 12<sup>th</sup> January 2022.**

**All Principals,  
Health Training Institutions with DCM Program**

**RE: INVITATION TO PARTICIPATE IN A SETTING/ MODERATION  
WORKSHOP OF SETTERS AND MODERATORS OF UAHEB  
EXAMINATIONS**

We're organizing a setting and moderation workshop for Setters and Moderators for the diploma in clinical medicine and community health program to train and implement the use of attest blue print in setting test items to enhance practical content in the assessment of clinical officer trainees at UAHEB. This is in preparation for Semester II 2021/2022 exams.

The purpose of this letter therefore, is to request your institution to facilitate the Principal and **three (3)** Health Tutor(s) to participate in this workshop. You're also requested to come along with necessary Reference Books.

Your positive response is highly indebted.

Yours,

**For Dr. Kamwesiga Julius T.**  
Principal Examinations Officer

## APPENDIX III: SAMPLE BLUE PRINTS FOR FIRST YEAR COURSE UNITS

### DCM TEST BLUE PRINT

**COURSE UNIT: NUTRITION AND DIETETICS  
1204**

**COURSE CODE: DCM**

SN	Topic	Content outline	Importance	Repetitive ness	Significance
1	Introduction to Nutrition	Definition and basic concepts used in nutrition	3	1	3
		Importance of Proper nutrition	3	1	3
		Essential food nutrients and their functions	3	2	6
		Food groups	3	1	3
		Healthy food plate, (pyramids & charts)	3	2	6
2	Nutritional Requirements	Nutritional requirements& interventions for infants and Young Child	3	3	9
		Nutritional requirements& interventions for pregnant and lactating mothers	3	3	9
		Nutritional requirements& interventions for school going and adolescent	3	1	3
		Nutritional requirements& interventions for elderly	3	1	3
		Nutritional requirements& interventions for in special medical condition such as:- Diabetes mellitus, -Heart and kidney diseases, - HIV/AIDS.- Obesity	3	2	6
3	Nutritional Assessment	Definition of Nutritional Assessment	3	1	3
		Importance of nutritional assessment	3	1	3

		Methods used in nutritional assessment (Anthropometry, biological, clinical, and dietary).	3	3	<b>9</b>
4	Malnutrition	Definition of common terms and concepts used in malnutrition	3	1	<b>3</b>
		Predisposing factors and causes of malnutrition	3	2	<b>6</b>
		Types and classification of malnutrition	3	3	<b>9</b>
		Managements of malnutrition conditions using integrated managements of acute malnutrition using Uganda clinical guideline	3	2	<b>6</b>
		Systemic complications in malnutrition	3	1	<b>3</b>
5	Fluids used in Malnutrition (Fluid that can be used cautiously)	Blood for very severe anaemia in shock	3	1	<b>3</b>
		Ringer's lactate with dextrose for correcting electrolyte imbalance	3	2	<b>6</b>
		Half strength darrows	3	1	<b>3</b>
		Precautions taken when giving fluids in malnutrition cases-	3	2	<b>6</b>
		Rehydration salts for the malnourished (RESOMAL)	3	2	<b>6</b>
		Dextrose for hypoglycaemia	3	1	<b>3</b>
		Other oral fluid in feeding F75&F100	3	1	<b>3</b>
6	Food Security, Processing and Safety	Definition of food security, processing and safety	3	1	<b>3</b>
		Causes of food insecurity in Uganda	3	1	<b>3</b>
		Food insecure household and vulnerable groups	3	1	<b>3</b>
		Intervention for improvement	3	1	<b>3</b>
		Factors in post-harvest losses	3	1	<b>3</b>

		Interventions for minimizing post-harvest losses	3	1	<b>3</b>
		Food sources with diversifications	3	1	<b>3</b>
7	Gender and Social Cultural Considerations in Nutrition	Definition of gender and culture	3	1	<b>3</b>
		Gender and social cultural Consideration in nutrition	3	1	<b>3</b>
		Male involvement in family health services, food security and nutritional health.	3	1	<b>3</b>
		Solutions to reduce heavy workload on women especially pregnant and lactating mothers	3	1	<b>3</b>
		Child rights to accessing holistic nutrition and eliminations of child labour	3	1	<b>3</b>
		Food Taboos & Norms that impair nutrition in women, infants, & children	3	1	<b>3</b>

### KEY TO SIGNIFICANCE SCORE

- 1.) 6, 9 – DOES i.e. performance in vivo e.g. with under cover standardized patients
- 2.) 4 – SHOWS i.e. performance in vitro e.g. OSCE with standardized patients
- 3.) 3 – KNOWS HOW i.e. procedural knowledge e.g. key feature, oral examination
- 4.) 1, 2 – KNOWS i.e. descriptive/elaborative knowledge e.g. MCQs, oral examination.

### KEY TO QUESTIONING VERBS

<b>DOES</b>	<b>SHOWS</b>
Prepare, examine, calculate, assess, design, prescribe, assemble, construct, develop, formulate, investigate, perform, derive, constitute, extract, re- constitute & conduct	Illustrate, identify, demonstrate, display, match, label & sort
<b>KNOWS HOW</b>	<b>KNOWS</b>
Describe, compare, relate, explain, discuss, evaluate, analyse, evaluate, account & justify	Select, choose, state, out line, define, list, name & mention

## DCM TEST BLUE PRINT

### COURSE UNIT: BASIC PRINCIPLES OF PHARMACOLOGY & ANTIMICROBIAL THERAPY CODE: DCM 1202

SN	Topic	Sub Topics	Content Outline	Importance	Repetitiveness	Significance
1	Basic Principles of Pharmacology	Introduction to pharmacology	<ul style="list-style-type: none"> <li>Definition of terms used in Pharmacology.</li> </ul>	2	1	2
			<ul style="list-style-type: none"> <li>Sources of drugs: Natural, synthetic, semi-synthetic</li> </ul>	2	1	2
			<ul style="list-style-type: none"> <li>Drug nomenclature: Proprietary (brand / trade) name, non-proprietary (generic) name, chemical name</li> </ul>	3	1	3
			<ul style="list-style-type: none"> <li>Classification of drugs according to: prescription, legislature and pharmacological.</li> </ul>	2	2	4

		Drug administration	<ul style="list-style-type: none"> <li>• Definition of drug administration</li> <li>• Advantages and disadvantages of the different routes of drug administration: <ul style="list-style-type: none"> <li>✓ Enteral</li> <li>✓ Parenteral</li> <li>✓ Topical/local</li> <li>✓ Inhalational</li> </ul> </li> <li>• Factors that affect drug administration</li> </ul>	3	3	9
			<ul style="list-style-type: none"> <li>• Drug formulations and dosage forms.</li> </ul>	3	3	9
		Prescription of drugs	<ul style="list-style-type: none"> <li>• Definition of a prescription</li> </ul>	2	1	2
			<ul style="list-style-type: none"> <li>• Contents of a prescription</li> </ul>	3	3	9
			<ul style="list-style-type: none"> <li>• Principles for prescribing</li> </ul>	3	1	3
			<ul style="list-style-type: none"> <li>• Qualities of a good prescriber</li> </ul>	3	1	3
			<ul style="list-style-type: none"> <li>• Abbreviations used in prescribing</li> </ul>	2	3	6
		Essential medicines and supplies	<ul style="list-style-type: none"> <li>• Concept of essential medicines, Qualities of essential medicines, Criteria for selection of essential medicines, List of essential medicines in Uganda</li> </ul>	3	1	3
			<ul style="list-style-type: none"> <li>• Rational use of medicines, Irrational use of medicines</li> </ul>	3	3	9

			<ul style="list-style-type: none"> <li>Ordering, storage and supply of medicine &amp; health supplies, Dispensing of medicines</li> </ul>	<b>3</b>	<b>1</b>	<b>3</b>
			<ul style="list-style-type: none"> <li>Explain and classify medicines and supplies under; Vital, Essential, Necessary</li> </ul>	<b>3</b>	<b>1</b>	<b>3</b>
			<ul style="list-style-type: none"> <li>Medicines supply and chain management</li> </ul>	<b>1</b>	<b>3</b>	<b>3</b>
		Pharmacokinetics and Pharmacodynamics	<ul style="list-style-type: none"> <li>Definition of pharmacokinetics, Description of: Absorption, Distribution, Metabolism and Excretion of drugs, bioavailability.</li> </ul>	<b>3</b>	<b>1</b>	<b>3</b>
			<ul style="list-style-type: none"> <li>Definition of pharmacodynamics and description of the different modes of drug action, drug receptors, drug interactions.</li> </ul>	<b>3</b>	<b>1</b>	<b>3</b>
2	Antimicrobial therapy	Introduction to	<ul style="list-style-type: none"> <li>Definition of antimicrobial agent.</li> </ul>	<b>2</b>	<b>1</b>	<b>2</b>

	antimicrobial therapy	<ul style="list-style-type: none"> <li>Principles of antimicrobial therapy.</li> </ul>	2	2	4
		<ul style="list-style-type: none"> <li>Classification of antimicrobial agents.</li> </ul>	3	1	3
		<ul style="list-style-type: none"> <li>Drug resistance</li> </ul>	3	1	3
	Antibacterial agents	<ul style="list-style-type: none"> <li>Beta lactam antibiotics (Penicillins, Cephalosporins, monobactams, and carbapenems)</li> </ul>	3	3	9
		<ul style="list-style-type: none"> <li>Aminoglycosides</li> </ul>	3	3	9
		<ul style="list-style-type: none"> <li>Sulfonamides</li> </ul>	3	3	9
		<ul style="list-style-type: none"> <li>Anti-tuberculosis agents</li> </ul>	3	3	9
		<ul style="list-style-type: none"> <li>Anti-leprosy agents</li> </ul>	3	1	3
		<ul style="list-style-type: none"> <li>Macrolides, and Lincosamides</li> </ul>	3	3	9
		<ul style="list-style-type: none"> <li>Quinolones and Fluroquinolones</li> </ul>	3	3	9
		<ul style="list-style-type: none"> <li>Tetracyclines and</li> </ul>	3	3	9
		<ul style="list-style-type: none"> <li>Amphenicols</li> </ul>	3	3	9
		<ul style="list-style-type: none"> <li>Nitromidazoles</li> </ul>	3	3	9
Antiviral agents	<ul style="list-style-type: none"> <li>Nucleoside reverse transcriptase inhibitors (NRTIs)</li> </ul>	3	3	9	
	<ul style="list-style-type: none"> <li>Non-nucleoside reverse transcriptase inhibitors (NNRTIs)</li> </ul>	3	3	9	



			<ul style="list-style-type: none"> <li>• Protease inhibitors (PIs)</li> </ul>	<b>3</b>	<b>3</b>	<b>9</b>
			<ul style="list-style-type: none"> <li>• Integrase inhibitors (INSTIs)</li> </ul>	<b>3</b>	<b>3</b>	<b>9</b>
			<ul style="list-style-type: none"> <li>• Fusion inhibitors (FIs)</li> </ul>	<b>3</b>	<b>1</b>	<b>3</b>
			<ul style="list-style-type: none"> <li>• Chemokine receptor antagonists (CCR5 antagonists)</li> </ul>	<b>3</b>	<b>1</b>	<b>3</b>
			<ul style="list-style-type: none"> <li>• Entry inhibitors (CD4-directed post-attachment inhibitors)</li> </ul>	<b>3</b>	<b>1</b>	<b>3</b>
			<ul style="list-style-type: none"> <li>• Other antiviral agents (Acyclovir, Ganciclovir, Rivabarin, Remdesivir)</li> </ul>	<b>2</b>	<b>2</b>	<b>4</b>
		Antifungal agents	<ul style="list-style-type: none"> <li>• Anti-metabolites</li> </ul>	<b>3</b>	<b>1</b>	<b>3</b>
			<ul style="list-style-type: none"> <li>• Azoles</li> </ul>	<b>3</b>	<b>3</b>	<b>9</b>
			<ul style="list-style-type: none"> <li>• Polyenes</li> </ul>	<b>3</b>	<b>3</b>	<b>9</b>
			<ul style="list-style-type: none"> <li>• Alkylamines</li> </ul>	<b>3</b>	<b>3</b>	<b>9</b>
			<ul style="list-style-type: none"> <li>• Topical Agents</li> </ul>	<b>3</b>	<b>3</b>	<b>9</b>
		Antiprotozoal agents/ Antiparasitic agents	<ul style="list-style-type: none"> <li>• Antimalarial agents</li> </ul>	<b>3</b>	<b>3</b>	<b>9</b>
			<ul style="list-style-type: none"> <li>• Anti-amoebic agents</li> </ul>	<b>3</b>	<b>2</b>	<b>6</b>
			<ul style="list-style-type: none"> <li>• Anti-helminthic agents</li> </ul>	<b>3</b>	<b>3</b>	<b>9</b>
			<ul style="list-style-type: none"> <li>• Drugs for ectoparasitic invasions</li> </ul>	<b>2</b>	<b>1</b>	<b>2</b>

### KEY TO SCORES

<b>Significance Score</b>	<b>Miller's Framework</b>	<b>Examples</b>
6,9	DOES	Performance in Vivo e.g Practical (Patients) & Section C qsns
4	SHOWS	Performance in vitro e.g Practical (OSCE) & Section C qsns
3	KNOWS HOW	Procedural knowledge e.g Section B questions
1,2	KNOWS	Descriptive/elaborate knowledge e.g MCQs, oral examination (Section A questions)

**APPENDIX IV: QUESTIONNAIRE ON STAKEHOLDERS' SATISFACTION WITH  
UAHEB EXAMINATIONS**

**TUTORS/ EXAMINERS:**

i. Year of Study [e.g. 1] \_\_\_\_ Academic Year [e.g. 2020/21] \_\_\_\_\_

ii. Program [e.g. DCM] \_\_\_\_\_ Course Code \_\_\_\_\_ Course Name \_\_\_\_\_

1. Did the candidates attempt all questions in the examination? Yes No If No, what could be the reasons?

.....  
.....  
.....

2. Were all the questions set within the semester curriculum content? Yes No

**If No**, list content for the questions set outside the curriculum.

.....  
....  
.....  
.....

3. Were the questions set appropriate for the level of the candidates? Yes No

.....  
.....

**If** \_\_\_\_\_ **No,** \_\_\_\_\_ **why?**

.....  
...

4. Did the candidates go for hospital or community placement this semester? Yes No If Yes, for \_\_\_\_\_ how \_\_\_\_\_ long?

.....

**If** \_\_\_\_\_ **No,** \_\_\_\_\_ **why?**

.....  
.....  
.....

5. Is hospital or community placement relevant in attempting questions in this examination? Yes No

**If No**, why?

.....

6. Is the content asked in this examination relevant during hospital or community practice? Yes No

7. Are there any other concerns about this examination that you would like to inform us about?  
.....  
.....  
.....

**END**

**THANK YOU VERY MUCH FOR YOUR TIME110**

**Questionnaire on Stakeholders' Satisfaction with UAHEB Examinations**

**CANDIDATES:**

- i. Year of Study [e.g. 1] \_\_\_\_ Academic Year [e.g. 2020/21] \_\_\_\_\_
- ii. Program [e.g. DCM] \_\_\_\_\_ Course Code \_\_\_\_\_ Course Name \_\_\_\_\_

**1.** Were you able to attempt all questions in the examination? Yes No

**If No, why?**

.....  
...

**2.** Were all the questions derived from the content covered this semester? Yes No

**If No, mention the content asked outside what had been taught this semester.**

.....  
.....  
.....

**3.** Were there questions within the content covered that you couldn't answer comfortably?  
Yes No

**If Yes, why?**

.....

**4.** Did you go for hospital or community placement this semester? Yes No If Yes, For how long?

.....  
...

**If No, why?**

.....  
.....  
.....

**5.** . Is the content asked in the examination useful during hospital or community placements?  
Yes No

**If No, why?**

.....  
.....  
.....

6. Did the hospital or community experience help you in answering questions in this examination? Yes No

7. Are there any other concerns about this examination that you would like to inform us about?

.....  
.....  
.....  
.....

**END**

**THANK YOU VERY MUCH FOR YOUR TIME**

## APPENDIX V: TABLE FOR DETERMINING SAMPLE SIZE FOR A FINITE

**Table 5: Table for Determining Sample Size for a Finite**

<i>N</i>	<i>S</i>	<i>N</i>	<i>S</i>	<i>N</i>	<i>S</i>
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2800	338
75	63	400	196	3000	341
80	66	420	201	3500	346
85	70	440	205	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	226	7000	364
120	92	600	234	8000	367
130	97	650	242	9000	368
140	103	700	248	10000	370
150	108	750	254	15000	375
160	113	800	260	20000	377
170	118	850	265	30000	379
180	123	900	269	40000	380
190	127	950	274	50000	381
200	132	1000	278	75000	382
210	136	1100	285	100000	384

Note.—*N* is population size. *S* is sample size.

**Population** Source: Krejcie & Morgan, 1970

*S* stands for sample and *N* stands for population