

A Consortium Approach to Competency-based Undergraduate Medical Education in Uganda: Process, Opportunities and Challenges

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ABSTRACT

Background: Uganda, like the rest of Africa, is faced with serious health challenges including human immunodeficiency virus infection/acquired immunodeficiency syndrome (HIV/AIDS), other infectious diseases and increasing non-communicable diseases, yet it has a significant shortage of health workers. Even the few health workers available may lack desired competencies required to address current and future health challenges. Reducing Uganda's disease burden and addressing health challenges requires Ugandan medical schools to produce health workers with the necessary competencies. This study describes the process which a consortium of Ugandan medical schools and the Medical Education Partnership for Equitable Services to all Ugandans (MESAU) undertook to define the required competencies of graduating doctors in Uganda and implement competency-based medical education (CBME). **Methods:** A retrospective qualitative study was conducted in which document analysis was used to collect data employing pre-defined checklists, in a desktop or secondary review of various documents. These included reports of MESAU meetings and workshops, reports from individual institutions as well as medical undergraduate curricula of the different institutions. Thematic analysis was used to extract patterns from the collected data. **Results:** MESAU initiated the process of developing competencies for medical graduates in 2011 using a participatory approach of all stakeholders. The process involved consultative deliberations to identify priority health needs of Uganda and develop competencies to address these needs. Nine competence domain areas were collaboratively identified and agreed upon, and competencies developed in these domains. **Discussion:** Key successes from the process include institutional collaboration, faculty development in CBME and initiating the implementation of CBME. The consortium approach strengthened institutional collaboration that led to the development of common competencies desired of all medical graduates to address priority health challenges in Uganda. It is important that the MESAU consortium continues engaging all stakeholders in medical education to support the implementation and sustainability of CBME in Uganda.

Keywords: Competency-based medical education, consortium approach, undergraduate education

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Background

Globally, there has been a realization that many health professionals cannot effectively manage the health problems of their patients and communities because they are not adequately trained in some essential competencies required for their jobs.^[1-3] Gaps in key competencies, including effective communication skills to patients and families as

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well as professionalism, have been described in medical education programmes.^[3,4] This has led to many institutions adopting competency-based medical education (CBME).^[5,6] CBME has been defined as an outcomes-based approach to the design, implementation, assessment and evaluation of a medical programme, using an organizing framework of competencies.^[5,7] This process requires that the priority health needs of the population are identified, before mapping out the specific learning outcomes or competencies. The competencies are then considered in the design of the curriculum or learning experiences for the trainees.^[3,5,7]

The approaches proposed to plan and implement CBME include: The Can Meds,^[8] the six competencies developed by the Accreditation Council for Graduate Medical Education (ACGME)^[9] and the Scottish doctor.^[2] Institutions in resource rich countries have used these approaches to guide development and revision of their curricula for training health professionals. The need to develop CBME in resource-limited countries has also been observed.^[3,4] Although the main competency domains required by health professionals are likely to be similar in both resource rich and resource-constrained countries, the specific competencies needed by health professionals in these situations are different.

The adoption of CBME globally has typically been institution-specific.^[7] To optimize the community and national health impact of curriculum reforms, institutions within a country should coordinate and collaborate in the adoption and implementation of CBME. In the long run, this is likely to improve the consistency and quality of training and education of future health professionals at national or regional levels.

The Medical Education Partnership for Equitable Services to all Ugandans (MESAU) consortium consists of five Ugandan medical schools, with Johns Hopkins University (JHU), USA providing technical support.^[10] MESAU works closely with the Ugandan government Ministries of Education, Health, local governments and other key stakeholders to catalyse capacity and performance enhancements in medical education, research and the work environment geared towards improved service delivery. One of the aims of MESAU is: *'To strengthen and sustain innovations in medical education, to produce graduates with competencies to address the priority health needs of Uganda.'*^[10] Thus, the MESAU consortium was leveraged to strengthen country-wide institutional collaboration in developing and implementing CBME. The consortium approach was viewed as an opportunity for Ugandan medical schools to build a national consensus on how to address priority health needs, which would lead to a more significant health impact than individual institutional efforts.

This paper describes the process that the MESAU consortium used to develop and plan for the implementation of CBME

in undergraduate curricula for Uganda. The study further highlights the opportunities and challenges for the consortium and for the individual institutions during the process of developing a common CBME.

Methods

Study Sites

The five MESAU institutions include four public universities: Makerere University College of Health Sciences (MakCHS), Mbarara University of Science and Technology (MUST), Gulu University and Busitema University and one private university, Kampala International University (KIU). MakCHS has employed student-centred learning approaches, including problem-based learning (PBL) and community-based education and service (COBES) since 2003.^[11] The other medical schools have been implementing teacher-centred learning methods and have COBES as part of students' learning experiences.

However, in Uganda, all curricula are approved by the Uganda National Council for Higher Education (NCHE). MESAU did not, therefore, prescribe details of the curriculum, but jointly developed a list of competencies. It was the responsibility of individual institutions to incorporate the competencies into their specific curricula.

Study Design

The study was retrospective and descriptive and utilised desktop, or secondary, reviews. Documents reviewed included: Uganda Demographic and Health Survey report;^[12] Uganda Health Sector Strategic Sector Plan III;^[13] Uganda National Health Policy;^[14] four reports of the MESAU consortium meetings; reports of the MESAU stakeholders meetings; ten Monitoring and Evaluation reports from MESAU institutions; reports of curriculum planning and review meetings; revised curricula from MakCHS, MUST and Busitema and versions of the revised draft curricula from Gulu and KIU.

Data extraction from the aforementioned documents was guided by use of checklists with information gathered regarding: Identification of priority health needs, identification of desirable competencies, stakeholders involved, duration of the process and extent of implementation of the identified competencies. The checklists were further used to explore curricula review and the approval process within MESAU institutions into competency-based models as well as the commencement of training and assessment of students using the identified competencies. The final step in data collection was an examination of the most recent MESAU curriculum development workshop report to identify successes, opportunities and challenges. Data were collected by three members of the research team; two members with medical education expertise (SK and RM) and one qualitative researcher (DKM).

Data Management and Analysis

Data were checked for accuracy and then imported into MS Word for coding. Analysis consisted of a qualitative methods approach.^[15] The study team jointly reviewed and manually analysed the data. This process involved constant comparison of data following an inductive process in which codes were developed. Codes were refined, compared and related to each other to generate categories, which were also compared with each other.

Results

Data analysis yielded four stages that the consortium passed through: (1) Developing competencies; (2) implementing strategies; (3) implementation of CBME at MESAU institutions and (4) outcomes (successes, opportunities and challenges).

Stage 1: Developing desirable competencies: This stage describes the process that was undertaken by the MESAU institutions to identify priority health needs in Uganda and develop desired competencies to address these needs. This participatory process, which took place in January and February 2011, involved three major steps.

Identification of Uganda population health needs: The first step in developing competencies was a deliberative dialogue to identify Uganda's priority health needs through two workshops. Each of these face-to-face workshops lasted two days, with an interval of two weeks between them. The process involved leaders and faculty from MakCHS, MUST, KIU, Gulu University and Busitema University. Participants included the Principal and Deputy Principal of MakCHS, Dean of the Faculty of Medicine Gulu University, Dean of the Faculty of Clinical Medicine and Dentistry KIU, Deputy Dean in charge of Education MUST and the leadership of Busitema University. In addition, other faculty from all MESAU institutions as well as clinicians practicing in the teaching hospitals of the universities participated in the workshops. The deliberations were partly informed by key documents including Uganda Ministry of Health reports, publications on competencies and by various meeting reports from consortia faculty members. The priority health needs identified were: Prevention of infectious diseases including malaria, human immunodeficiency virus infection/acquired immunodeficiency syndrome (HIV/AIDS) and tuberculosis; prevention of maternal morbidity and mortality; prevention of child morbidity and mortality; and addressing the increasing burden of non-communicable diseases including cardiovascular diseases, diabetes mellitus and cancers.

Identifying competency gaps: The participatory deliberations through active group discussions then focused on finding out reasons as to why medical graduates were not substantially

addressing the above health needs. Relevant literature was reviewed during this process.^[4] It was discovered that this challenge was majorly due to gaps in ideal graduate competencies required to address the health needs. Identified competency gaps among current medical graduates in Uganda included: Professionalism and ethical practice; communication skills; leadership and management skills; and skills to empower communities to prevent disease and promote health.

Developing competencies: Having identified the health needs and key competency gaps, MESAU resolved to adopt common medical education competencies in Uganda to link training to health systems in the community in order to address identified gaps. The process of developing the actual competencies for medical graduates was participatory and collaborative through three face-to-face workshops, involving the same people who were involved in the identification of Ugandan population needs, and were held every fortnight. It involved discussing the concepts of CBME led by faculty with expertise in medical education. During these interactive discussions, various frameworks used to plan and implement CBME were explored. Key among these included: Can Meds,^[8] ACGME,^[9] World Federation for Medical Education (WFME) standards,^[16] competencies developed by Scottish medical schools^[2] and University of Minnesota Competencies^[17] for medical training, among others.

This discussion was followed by group work in which members in small groups were tasked to identify relevant knowledge and skills needed by medical graduates to address the observed competency gaps as a way of addressing the priority health needs in Uganda. A plenary session followed in which the small groups presented their findings of desirable skills, and these were further discussed by the larger group. This discussion led to the amalgamation of the skills identified by various groups into main competence domains that were then drafted. The domains identified as relevant were those where competency gaps of current medical graduates existed as well as those that had been identified to be important to address Uganda's health needs by earlier studies that involved different stakeholders.^[4]

Having identified the main competence domains, each small group was again assigned the task of identifying competencies to one or more main competence domains, and later presented to the plenary where feedback was given. The outcome of this exercise was the draft of the major competence domains and competencies relevant for medical training in Uganda. This draft was subsequently circulated to leaders of individual consortia institutions to get feedback and input from other individual institutional members through workshops and meetings. Every consortium institution held one meeting or workshop for this purpose. The feedback was subsequently incorporated into the draft by a small working group.

The last step was holding a stakeholders consultative meeting to review the drafted competence domains and competencies and to reach a consensus on the final draft. Stakeholders included: Leaders and faculty from the MESAU institutions, officials from the Ministry of Health, Ministry of Education and Sports, Ministry of Local Government, top leadership of the Universities, District Directors of Health, development partners, and community and student representatives. The outcome of the stakeholders meeting was reaching a consensus on the final competence domains and competencies.^[18] In order to build consensus, the process of developing competencies took twice as long as that of identifying the health needs of the Ugandan population, and involved a wider range of stakeholders. The agreed Uganda medical education competencies are in the nine domains of: Medical knowledge; clinical skills and patient care; critical inquiry and scientific method; professionalism and ethical practice; leadership and management skills; population health; continuous improvement of care through reflective practice; and health systems management [Table 1].

Stage 2: Implementation strategies: This stage describes the process of implementing CBME at individual MESAU institutions. This process also involved three steps.

MESAU Consortium planning meetings: MESAU held four joint planning meetings for CBME implementation. In October 2011 and July 2012, faculty from JHU facilitated curriculum development and evaluation workshops respectively for selected faculty (MESAU consortium curriculum development committee - MCCDC) from the MESAU partner institutions.

In November 2012, the MCCDC discussed and agreed on the methods that should be used to assess the students' learning. Specifically, the committee agreed that all institutions should

adopt the Objectively Structured Clinical Examination (OSCE), Mini Clinical Examinations (MIN-CEX), as well as the portfolio as methods of assessing students' competency in a number of areas. The need for observation of students during learning, and providing them with immediate constructive feedback by faculty, was also stressed. In February 2013, another meeting was held where institutions shared progress made in the development and implementation of CBME and challenges faced during the process.

Training faculty in CBME: In order to develop capacity in implementing CBME, faculty were trained in the following areas: Competency-based education, competencies relevant for undergraduate medical education in Uganda, six step approach for developing Competency Based Education,^[19] and curriculum evaluation and assessment of students' learning. This was done through workshops facilitated by local faculty members with expertise in medical education in conjunction with faculty from JHU. Each institution in the consortium formed a committee responsible for planning for continuous professional development of faculty in evidence-based practices of medical education.

Revision of curricula and changing them into competency-based models: Each of the MESAU Consortium institutions has either completed or is in the process of reviewing their curricula to make them competency-based. The competencies that were developed for undergraduate medical training in Uganda guided this process. The institutions also used institution-based guidelines and the Uganda NCHE guidelines to revise the curricula. This process began in March 2011, and each of the institutions follows its own work plan.

Stage 3: Progress in the implementation of CBME at MESAU Institutions: This stage outlines the extent to which revision of

Table 1: Competency domains for Undergraduate Medical Education in Uganda

Competence domain	Description
Medical knowledge	Graduates should demonstrate the ability to recall knowledge of human structure, function, development and pathophysiology; and of epidemiological and social-behavioural sciences and apply it in providing care to individuals, families and society
Clinical skills and patient care	Graduates should demonstrate effective use of motor and cognitive skills to provide compassionate and appropriate diagnosis, management and prevention of common health problems encountered in patient care
Critical inquiry and scientific method	Graduates should demonstrate an understanding of scientific theory, methodology and critical thinking skills to conduct research, interpret findings and apply these to improve individual, family and community health
Professionalism and ethical practice	Graduates should demonstrate through knowledge and behaviour a commitment to the highest standards of competence, ethics, integrity and accountability to the patient, society and the profession
Interpersonal and communication skills	Graduates should demonstrate effective inter-personal and communication skills with a wide range of individuals and groups in order to provide appropriate health care
Leadership and management skills	Graduates should demonstrate appropriate leadership and management skills for effective and efficient health systems
Population health	Graduates should demonstrate the ability to work with the community to promote health, prevent disease and empower communities in order to produce a healthy population
Continuous improvement of care through reflective practice	Graduates should demonstrate the ability to investigate and evaluate their practice, appraise and assimilate scientific evidence, and to continuously improve health care based on constant self-evaluation and lifelong learning
Health systems management	Graduates should demonstrate an understanding of the composition, organization, economics and other interrelated dynamics of health service provision and the ability to practice within the health system

curricula into competency-based models and implementation has progressed across the MESAU individual institutions. Curriculum review and implementation is being led by a curriculum committee at each institution.

MakCHS completed this process in May 2011. The curriculum revision process involved a number of workshops that involved faculty, student representatives and administrative staff. Competencies were incorporated into the undergraduate medical programme, and into each of the courses in the programme. Learning experiences were identified to enable students acquire the competencies. In addition, appropriate methods of assessing the competencies were identified in the curriculum. The revised curriculum was approved by the Senate Quality Assurance Committee that is in charge of approving curricula at Makerere University. MakCHS is in the second year of implementing this competency-based curriculum having started with students admitted for the 2011/12 academic year.

MUST began the process of revising the medical curriculum in 2011. As at MakCHS, the process involved a number of workshops, and was completed in June 2012. The new curriculum has been approved by the Senate of MUST, and implementation started with the student class of the academic year 2012/13.

Gulu and Kampala International Universities have completed the process of curriculum review and are waiting for institutional approvals. Busitema University completed development of the competency-based curriculum in 2011, and is awaiting final approval from UNCHE.

Stage 4: Outcomes (Successes, Opportunities and Challenges):
Successes: It has been possible for faculty with expertise in medical education from the Institutions to support other institutions during joint workshops. Furthermore, other organisations including the Ministry of Health, Ministry of Local Government, Ministry of Education, Public, Private and Faith Based Health Facilities, local Non-Governmental Organisations, as well as International Agencies such as Capacity Plus have participated in the development and implementation of CBME in Uganda.

Although not all the consortium medical schools have completed the process of curriculum review, education and training of students in some of the MESAU competencies has been implemented at MUST, MakCHS and KIU. This is because all the medical schools use COBES, which has provided students with learning experiences to acquire competencies in the domains of population health, leadership and management skills, as well as health systems management. Institutional faculties have also shared experiences in how competency-based education is implemented. The MESAU

institutions have used Information Communication and Technology (ICT) through Electronic-Learning (e-learning) to support student learning and to create opportunities for students and faculties in different institutions to learn together and from each other through video conference sessions. ICT and e-learning contribute to students acquiring competency mainly in the domains of knowledge, communication and interpersonal skills, as well as critical inquiry and the scientific method.

Opportunities: Working as a Consortium has provided several opportunities. Being able to encourage stakeholders to reach an agreement on medical education is an important opportunity, for example, in terms of advocating for resources. There is also opportunity for strengthening public-private partnerships in medical education with KIU, a private University working with the public medical schools. Additionally, standardizing undergraduate medical education across institutions through the integration of common competencies into curricula has the potential of addressing the health needs of the population of Uganda coherently. Lastly, working as a Consortium provides the opportunity for the medical schools to identify and share resources.

Challenges: The major challenge has been the inadequate number of experts in education for medical/public health/health care organisations and health systems, which has affected the process of implementation. In addition, several of the institutions that have been using teacher-centred approaches have had challenges of introducing innovative, learner-centred approaches. MESAU institutions have faced the challenge of developing relevant tools for monitoring and evaluating the implementation of CBME as well as assessment tools for the learner competencies. Although the OSCE, direct student observation and Portfolio have been identified as methods of assessing student learning of the MESAU competencies, some of the medical schools still have a challenge in implementing these methods. It is therefore important that the MESAU partners bring on board more experts in medical education and health systems management such as the World Health Organisation (WHO), and strengthen the partnerships with international universities and institutions for faculty development and building local capacity in health professions' education.

Although MESAU has identified faculty development as a strategy for addressing most of the above challenges, the institutions are still faced with the challenge of inadequate systems and the inadequate number of experts in medical education to develop and implement faculty development programmes. This is exacerbated by inadequate human resources, infrastructure and learning environments to appropriately facilitate student learning.

Discussion

This study described the process, successes, challenges and lessons learned in harnessing the potential of a consortium approach to develop and plan the implementation of CBME in Uganda. Gaps in competency domains of public health, leadership, communication and interpersonal skills and professionalism need to be addressed in medical education in Uganda, in order to address the health needs of the population and community.

The greatest advantage of using the consortium strategy for developing competencies was the active involvement, engagement and empowerment of all stakeholders in the process. Innovations in medical education meet challenges mainly because stakeholders are not involved, yet they are called upon to implement such innovations.^[20] Actively engaging all stakeholders in the process largely explains why the institutions have adopted the common competencies. Additionally, institutional collaboration, which demonstrated a shared goal of improving medical training in Uganda, was a major strength in driving the process. Cameron points out that such collaboration that surpasses individual institutional interests provides a firm foundation for successful and sustainable innovations.^[21]

Institutional collaboration using existing resources to achieve a common goal has also been reported with success elsewhere.^[5,6,22] Such an approach offers a number of opportunities for a country like Uganda. First, it aims at equipping graduating doctors from all institutions with common competencies needed to address the health needs of the country. Second, it also has the potential to set standards for medical training, and assessment, which enhances the quality of medical education and ultimately the quality of health professionals. In addition, institutions working together are more effective in engaging stakeholders to support the training of health professionals, in mobilizing and sharing resources for improving infrastructure, and in implementing faculty development programmes. The MESAU consortium should therefore plan and implement a common strategy for mobilising funds and other resources to support medical education from within and outside Uganda.

Finally, institutional collaboration has led to a common voice in developing the competencies. Prior to this consortium, medical schools in Uganda did not have a common agenda for medical training. By coming together to have common competencies the institutions can now speak with one voice. Key competency gaps like communication, professionalism, leadership and management were collaboratively addressed. Additionally, MESAU has registered key successes in propelling the use of ICT and e-learning to support student learning in a number of competency domains. Virtual interactive and

collaborative learning sessions are now possible among the medical schools. This has facilitated the use of e-learning platforms within Ugandan medical schools. However, the use of e-learning to support the student learning for all MESAU competencies needs to be further developed.

MESAU has also strengthened faculty development during the process of developing and implementing CBME. They have acquired knowledge and skills for the development and delivery of CBME curricula, which ultimately will improve the quality of teaching and learning. Although faculty development still remains a key priority within the consortium, this process has established a foundation, which can be further strengthened.

Inadequate human resource expertise, inadequate infrastructure and change management are still key challenges faced by the institutions and have slowed the implementation of CBME. Such challenges have been reported elsewhere as well.^[5,23,24] However, since the consortium institutions employ COBES, this provides an opportunity for students to learn vital competencies like population health, leadership and management skills, professionalism and ethical practice in a real contextual environment where they are likely to work upon graduation.

Assessment has been described as key in the implementation of CBME.^[5,6,25] The consortium has identified the need to focus on assessment to drive the development of the desired learner competencies. In addition, the consortium has prioritised faculty development as a strategy to overcome the challenges of implementing CBME. The consortium approach of shared faculty development workshops, sharing best practices and collaboration with resource rich and more experienced institutions to address faculty development needs is in line with recommendations by previous authors.^[5,26] Our institutions have also identified the need to plan and implement student-centred learning approaches to enable students to acquire the desirable competencies in a flexible manner. It is hoped that MakCHS, which has been implementing student-centred learning during the past ten years, will support other institutions in this respect.

This study has documented the successful initiation of CBME in resource-limited settings using a consortium approach. Key lessons learned are institutional collaboration, involvement, empowerment and engagement of all stakeholders. Such an approach could be one way of initiating and sustaining changes in medical education. The institutional collaboration strengthens the struggle towards a common goal. Active participation and involvement creates a sense of ownership by all stakeholders and therefore facilitates acceptability and long-term sustainability.

A limitation in this study is that we did not conduct in-depth key informant interviews and focus group discussions with faculty who were involved in the process, which would have strengthened the methodological rigor. However, this was not possible due to resource constraints. Additionally, implementation of CBME started 2 years ago at MakCHS, but has just started at MUST, and not yet started in other MESAU institutions. It was therefore not possible to evaluate the greater impact of the MESAU approach. Though this study largely focused on the process, there is a comprehensive plan to evaluate the impact in the future.

Overall, a consortium approach has successfully engaged stakeholders to develop competencies relevant to undergraduate medical education in Uganda. Inadequate infrastructure and faculty expertise, and change management have been cited as major challenges of implementing CBME at the partner institutions. It is important that the MESAU consortium continues to engage all stakeholders in medical education to support the implementation and sustainability of CBME in the entire nation. Shared faculty development and partnerships are key to the success of CBME in the country.

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