

## ORIGINAL RESEARCH

# Evaluation of community based education and service courses for undergraduate radiography students at Makerere University, Uganda

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## A B S T R A C T

**Introduction:** The Faculty of Medicine, Makerere University, is the oldest health professionals' training institution in East Africa. It has been training health professionals since 1924. In 2001, a bachelors degree in radiography commenced. After a curriculum review, the university's longstanding traditional curriculum was converted to a problem based learning curriculum with a focus on Community Based Education and Service (COBES). As a component of COBES, radiography, medical, nursing, dentistry and pharmacy students are sent to community health facilities where they are expected to participate in community services and other primary healthcare activities. This study was designed to obtain radiography teachers' and students' opinions of the significance and relevance of this community based training to radiography training.

**Methods:** Cross-sectional descriptive study.

**Results:** Both students and teachers (91.4%) affirmed the community training to be significant and relevant to radiography training. In total, 71.4% of the students had participated in X-ray services and 39.2% in ultrasound services during COBES; and 68.6% of the students reported the need to be better prepared for the COBES training.

**Conclusion:** Both students and teachers confirmed COBES to be relevant to Ugandan radiography training.

**Key words:** COBES, radiography, training, Uganda.

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## Introduction

The Faculty of Medicine, Makerere University was founded in 1924 and has offered a traditional curriculum for over 80 years. A change from a traditional lecture-based curriculum to problem based learning with a focus on Community Based Education and Service (COBES) commenced in the 2003/2004 academic year<sup>1</sup>. The faculty offers five undergraduate programs: medicine and surgery, radiography, pharmacy, nursing and dentistry. The radiography degree commenced in 2001/2002 academic year, and its duration is 3 years. The new curriculum is based on the Student-centered, Problem-based, Integrated, Community based, Elective and Systematic (SPICES) model<sup>2</sup>.

In Uganda, healthcare delivery has been decentralized 'from the top to the bottom', with the aim of bringing services nearer to the people<sup>3</sup>. From 'the top' downwards, there are national referral hospitals, regional referral hospitals, district hospitals, and health centres IV to I, at county, sub-county, parish and village levels, respectively. Each level offers different services, from the general health services at health centre I to more specialist services in referral hospitals. Participation in COBES trains radiography students at each of these different levels of the healthcare system, familiarizing them with the various functions and allowing interaction with the communities they serve. It is hoped that this will equip them to handle the priority health needs of the communities.

In the radiography curriculum, COBES is delivered in two phases during Year 1 and Year 2, encompassing an introduction to community health, community diagnosis and communication over 11 weeks. Before their departure to the community, students participate in tutorials that focus on key themes, such as biostatistics, epidemiology, demography, communication skills, community entry protocols and cultural safety. Following the tutorials, students are assigned

to groups of 8-10 undergraduates from all programs at the faculty. These groups work together at the assigned health facility to establish a diagnosis of an immediate community health need (eg identifying the most prevalent disease in the community), which, if addressed, will assist communities to improve their health status.

At the health facility, a university-trained, supervising site tutor coordinates student activities, facilitates learning and carries out student assessment. Course assessment encompasses continuous progressive assessment of weekly activities entered in logbooks, tutorial assessment, written examination papers, submitted student reports and oral presentations on students' experiences.

There is a dearth of literature regarding community based training for radiographers, with the majority focusing on medical education in community settings. It has been reported that health professionals are currently inappropriately trained to address the health needs of the public, particularly the proportion who are disadvantaged<sup>4</sup>. Health disparities exist worldwide but are in crisis proportions in developing countries, where the magnitude of existing health problems far outstrips available resources. However COBES is one strategy to address this disparity, by training service providers, educators and researchers who can assist communities to identify priority health needs and implement feasible, sustainable and affordable interventions<sup>4</sup>. In addition, community-oriented health professionals have been reported to be adaptive across a variety of settings, to demonstrate leadership capacity and humility, and to become advocates for the disadvantaged<sup>4</sup>. Any health professional, but radiographers in particular, may find themselves working in resource-constrained situations for which they were not trained; COBES can prepare students for this possibility.

A link has been established between eventual rural health careers and a required rural health module, with a complete community based rural health course reported to improve



students' interest in rural health practice<sup>5</sup>. However, there are significant barriers to sustaining such courses, including a lack of suitable rural placements and well-informed human resources to facilitate the learning process in rural settings. In addition, such a course may be expensive and logistically difficult to implement effectively<sup>6</sup>. While there is no lack of rural placements in Uganda, the issues of expense and difficulty in implementation are pertinent. Further research is suggested in order to investigate whether the investment of time and effort in community courses is justified<sup>6</sup>.

The purpose of the present study was to assess the opinions of student radiographers and their teachers regarding the relevance of COBES training, as well as to establish the challenges encountered by students during their community placements. It is hoped that the findings will be useful in improving existing and future courses, as well as healthcare delivery in Uganda.

## Methodology

### *Study setting*

This study was conducted at the Faculty of Medicine, Makerere University, and the COBES sites of Kayunga and Gombe District Hospitals.

### *Study design*

This was a cross-sectional, descriptive study in which questionnaires were administered and focus group discussions conducted.

The questionnaire included a section seeking consent, which assured participants anonymity and confidentiality. It also gathered socio-demographic data (gender and age), and offered closed-ended statements to which participants responded by grading each statement on a scale of 1–4 (1 was strongly disagree, 2 disagree, 3 agree and 4 strongly

agree). The questionnaire also included open-ended questions seeking participants' opinions of COBES.

Focus group discussions were tape-recorded and transcribed. There were three focus groups of 4–5 members with two members of the research team present, one to ask questions and the other to take notes. Verbal consent was obtained from all focus group members. Issues and opinions raised during focus groups were treated with utmost confidentiality.

### *Sample size*

There were 35 participants, including 11 second-year radiography students, 11 third-year radiography students, 6 radiography graduates, 5 teachers and 2 site tutors.

### *Data analysis*

Data was both quantitative and qualitative. The quantitative data was analysed by a statistician in the presence members of the research team and focused on the closed-ended statements. For data interpretation, 'strongly disagree' and 'disagree' were coded 'disagree', while 'agree' and 'strongly agree' were coded 'agree'. Responses were tallied, coded, counted and entered into the Epi-Info statistical package (WHO; Geneva, Switzerland) and percentages were obtained.

Qualitative data were analyzed by the researchers because, in qualitative research, the investigator becomes the instrument of both data collection and analysis<sup>7</sup>. This involved content analysis to extract the meanings of the informants, and also transcription. This raw data was proof-read against the audio-taped interviews and coded into categories of similar meaning. Relationships between categories were established, resulting in content themes, consistent with the value of thematic content analysis in qualitative methods<sup>8</sup>. These themes summarized the meaning of the data, which addressed the purpose of the study.



## *Ethical issues*

Consent was obtained from the Radiology Department Education Committee. Confidentiality of participants was maintained throughout the study.

## Results

Of the 35 participants, 21 (60%) were male and 14 (40%) female. The majority of the participants (83.3%) were in the age range 18–24 years.

### *Quantitative results*

Most of the participants (91.4%) reported having understood the importance and significance of COBES in the radiography curriculum, and 85.7% of the students reported satisfaction with the COBES content.

The students' level of participation in COBES activities is summarized (Table 1). Only the 28 students (excluding the trainers and site tutors) responded to this section.

As the table shows, students participated more in X-ray than ultrasound scanning, and they did not engage in radiography research. However, students reported that COBES provided a satisfying learning experience and prepared them to become better health professionals.

The majority of the students (71.4%) were aware of radiography activities during COBES and 85.7% were satisfied with the duration of the community placements. However, the majority of the students (68.6%) believed they should have been better prepared for the community training.

### *Qualitative results*

Three key themes were identified: (i) the significance of community based education and its service in radiography training; (ii) participation in COBES activities and the

application of acquired skills; and (iii) preparation for COBES activities.

**The significance of community based education and its service in radiography training:** This included the central precepts of and the relevance of COBES to radiography training. It included concepts such as the importance of community based education in the radiography curriculum and the relevance of the COBES topics and activities to radiography training. The majority of the students demonstrated a clear understanding of the significance, importance and relevance of COBES to the radiography curriculum, and reported knowing COBES objectives well. This was reflected in the student comment:

*When I went for COBES, I realized that this community internship was vital to my training because I had to actively participate in community health education and promotion as a health worker; yet before, I thought I was supposed to be in the X-ray room most of the time.*

The teachers indicated that COBES courses were very important to radiography students because the students become acquainted with communities they will eventually serve.

**Participation in COBES activities and the application of acquired skills:** This theme encompassed the realities of clinical practice at the sites, as well as primary healthcare activities. It included activities such as participation in X-ray and ultrasound imaging, community home visits, and radiography related research. The students reported that the community sites provided a more satisfying environment to participate in various activities and to acquire skills which they could apply after graduation. One student reported, 'In COBES, I am under less pressure from lecturers and therefore I get the passion to learn'.



**Table 1: Students' level of participation in COBES radiography activities at the sites**

Response	Agree n (%)	Disagree n (%)
I was actively involved in X-ray imaging	20 (71.4)	8 (28.6)
I was actively involved in ultrasound imaging	11 (39.2)	15 (60.8)
Community home visits are important for radiography students	25 (89.3)	3 (10.7)
I was involved in radiography related research	0	28 (100)

**Preparation for COBES activities:** The most common aspects identified were having adequate learning and financial resources, as well as time. Both teachers and students reported that preparations could be improved. Key among needed preparation were proper instructions to students and facilitators at the sites, provision of adequate learning materials and financial support for students, as well as providing enough time for students to carry out planned activities. One teacher summarized the issue, 'If we could improve on our preparations in all aspects, COBES would be a more worthwhile and highly effective venture.'

## Discussion

As reflected in the results, COBES is important to trainee radiographers. Mpofo et al. reported that students need to spend time in community health facilities away from the teaching hospital so they understand the health needs of the community<sup>9</sup>. As a result of their participation, our students understood they had to be involved in community health activities as health workers, along with students from other disciplines. Conversely, the participation in COBES of radiography students made staff and those in the community aware of the existence of imaging services<sup>9</sup>.

Bor has observed that community health professionals can often become advocates for the disadvantaged<sup>4</sup>; this was evident in our study. While radiography is advancing rapidly in developed countries, in the developing world progress is slower due to widespread limitations in equipment. When

radiography students interact with community leaders they can advocate for the acquisition of advanced equipment. Indeed, one student reported, 'I had to ask the District Director of Health Services why a whole District Hospital had no X-ray machine!'

Healthcare providers should all be equipped with basic primary healthcare knowledge in order to advance standards of health through health promotion and education<sup>10</sup>. It has been reported that community-oriented practitioners engage with the community and political processes and use their epidemiological skills to assess and track the needs of the community<sup>4</sup>. In resource-poor countries such as Uganda, every health worker should be equipped with the skills to promote health.

When radiography students mix with students from other programs, COBES stimulates their interest in undertaking rural health careers. Multi-professional interaction and teamwork among students in the community during learning activities suggest key elements of working in a rural environment as a graduate<sup>5,10</sup>. However, rural healthcare delivery is collaborative in nature and the inability of multi-professional teams to communicate has, at times, led to a failure to respond to the needs of service users<sup>11</sup>, as was also emphasized in 1988 by WHO in the statement Learning Together to Work Together for Health<sup>12</sup>. COBES aims to avoid this pitfall by the radiography students working collaboratively in learning, and so gaining experience of the multidisciplinary approach, as is practised in small health units.



The low level of student participation in ultrasound in this study may be explained by the fact that some COBES sites lacked the required imaging equipment and properly trained personnel. This was reflected in one student's comment:

*Although the ultrasound machine was available, it was faulty and there was only one nurse who had got a three-week training in ultrasound in charge, so I lost interest.*

This identified ongoing challenges in providing rural placements where students can achieve maximum practical benefits<sup>6</sup>. It also suggests a need to advocate for disadvantaged communities, by urging policy-makers to equip rural health facilities with basic imaging equipment such as ultrasound.

Community based training prepares students for an effective professional life through the acquisition of skills such as critical thinking, problem-solving and innovation as they experience the realities of health care in the community. In this way they may more easily link theoretical knowledge with practice, via experience gained in the community<sup>5</sup>.

During community placements, students encounter a kind of training different from the teaching hospital<sup>5</sup>. Away from the faculty and its strict timetables, at the COBES sites students have the freedom to design their own schedules and make their own decisions. The students find this an enjoyable and satisfying learning experience.

It should be noted that community based training is an expensive venture that involves an additional burden of expenditure and thus has logistical implications<sup>6</sup>. In developing societies there will always be inadequate resources for such a venture. This situation was implied when a student said, 'I gave up doing some assignments because I never had any reading material'. While every effort must be made to prepare students adequately and equitably in terms of financial, learning and logistical resources before they commence community placement,

such a community experience can also be an opportunity for students to learn about managing in a context of limited resources.

## Conclusion

In conclusion, COBES is proved to be important for Ugandan radiography training, as reported by the students and their teachers. However, it is important to place radiography students at sites with adequate imaging facilities and trained personnel, as well as to encourage them to take part in radiography research activities. In this way students will gain the greatest benefit from the COBES learning opportunity.

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