

Identifying approaches and tools for evaluating community-based medical education programmes in Africa

A Dreyer,^{1,2} MPH; I Couper,^{1,2} MB BCh, MFamMed; R Bailey,³ MSPH, CED; Z Talib,⁴ MD; H Ross,⁵ MPH; A S Sagay,⁶ MB ChB

¹ Centre for Rural Health, Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, South Africa

² MEPI consultant for the CapacityPlus Project led by IntraHealth International, Chapel Hill, North Carolina, USA

³ Health Workforce Development, USAID-funded CapacityPlus Project led by IntraHealth International, Chapel Hill, North Carolina, USA

⁴ MEPI Coordinating Center, George Washington University, Washington, DC, USA

⁵ USAID-funded CapacityPlus Project led by IntraHealth International, Chapel Hill, North Carolina, USA

⁶ Department of Obstetrics and Gynaecology, College of Medical Sciences, University of Jos, Jos, Nigeria

Corresponding author: I Couper (ian.couper@wits.ac.za)

Background. The US President's Emergency Plan for AIDS Relief (PEPFAR)-funded Medical Education Partnership Initiative (MEPI) aims to support medical education and research in sub-Saharan African institutions. The intention is to increase the quantity, quality and retention of graduates with specific skills addressing the health needs of their populations. While many MEPI programmes include elements of community-based education (CBE), such as community placements, clinical rotations in underserved locations, community medicine, or primary healthcare, the challenge identified by MEPI-supported schools was the need for appropriate approaches and tools to evaluate these activities. This article outlines the process of identifying tools that, with modification, could assist in the evaluation of CBE programmes in participating MEPI schools.

Methods. A literature search was carried out to identify approaches and tools that could be used in Africa to evaluate CBE programmes. The search included published, peer-reviewed literature as well as grey literature and websites. Evaluation tools considered appropriate were obtained from the articles or their authors for inclusion in a compendium of example CBE evaluation tools. All tools sourced through the search were entered into a CBE evaluation matrix, which included an analysis of the tool in relation to Kirkpatrick's four levels of evaluation.

Results. Out of 37 sources included as appropriate, 8 sets of CBE evaluation tools were obtained for the compendium. Most of the evaluations were quantitative, relied on Likert-type scales, and focused on measuring CBE activities and intermediate outcomes in terms of student learning. When categorised according to the level of the evaluation, the evaluations largely focused on levels 1 and 2 of the Kirkpatrick model, as measured through students' reactions to and learning from the CBE programmes. Tools that focused on student assessment, rather than programme evaluation, were excluded from the final set.

Conclusion. With the shortage of published literature on CBE evaluation, the findings of this literature review will assist African medical schools in developing appropriate evaluation approaches and tools.

Afr J Health Professions Educ 2015;7(1 Suppl 1):134-139. DOI:10.7196/AJHPE.568



The US President's Emergency Plan for AIDS Relief (PEPFAR)-funded Medical Education Partnership Initiative (MEPI) supports medical education and research at institutions in 12 sub-Saharan African countries. The intention is to increase the quantity, quality and retention of graduates with the skills needed to address the health needs of local populations. MEPI has convened Technical Working Groups (TWGs) in areas of common concern throughout its network. One of these TWGs focuses on community-based education (CBE). CapacityPlus, led by IntraHealth International, is the USAID-funded global project uniquely focused on the health workforce needed to achieve international and national health goals. CapacityPlus collaborates with MEPI in building CBE capacity among the MEPI-supported schools.

CBE is an approach that was developed in the 1980s and 90s whereby students acquire public health, clinical, and/or research skills, usually through applied learning in a community setting,^[1] with goals that include: creating knowledge, skills and attitudes among students to ensure they are capable of providing high-quality health services to local, underserved communities, often in rural areas and with significant resource constraints; deepening understanding of health and illness and the contribution of social and environmental factors to causation and prevention of ill-health; preparing students to function within health and

social services as part of multidisciplinary teams; and increasing retention in underserved areas after graduation.^[2,3]

There is much inconsistency in the use of terms related to CBE. The most common categories described are: community-oriented medical education, in which programmes address topics in community health but the teaching takes place in traditional academic settings; community-based medical education, in which activities take place in community settings, including health facilities in communities; and community-engaged medical education, in which programmes engage with members of a community in their design, conduct and/or evaluation of activities.^[4,5] As there is much overlap, all three concepts were included in this study.

Many MEPI programmes include elements of CBE in their medical undergraduate curricula, such as community placements, clinical rotations in underserved locations, community medicine, or primary healthcare. However, evaluating the success of each CBE programme in reaching its aims is technically demanding, requiring targeted and validated approaches and tools, and was raised as an important need in a survey of 12 schools that are part of the MEPI CBE TWG, described elsewhere.^[1]

The CBE programmes of MEPI-supported schools are at widely different stages in their development, from those that are newly introduced through to

Table 1. Programme evaluation logic model

Stages	Description and characteristics	Examples
Programme goals	Big-picture ideas underlying a programme. What change will the programme make?	More health workers will provide quality community-level care during careers in underserved locations
Inputs	Key resources of a programme	Staff; curriculum; partner institutions; funding; facilities
Activities	Things done by a programme that reach participants or others	Workshop on {topic}; research project; clinical practical experience
Outputs	Tangible products/by-products of activities (but not whether students learned anything)	Certificates of completion; records of actions by participants (i.e. log books); number of students at clinical site
Intermediate outcomes	Learning connected to activities	Students understand {topic}; students are able to {skill}
Outcomes	Effects connected to activities or intermediate outcomes such as changes in behaviour, action or decision-making	Graduates apply knowledge to {context}; graduates use new method to perform {action}; graduate chooses to practise in {geographical area}
Impact	Ultimate impacts, connected to medium- and short-term outcomes	Better care of patients; more graduates working in community

those with many years' experience to draw upon. Therefore, members of the MEPI network require approaches and tools to evaluation which fall all along the continuum of programme stages in a logic model framework – those which could be used to evaluate how well the *process* of the programme was implemented; how well students *progress* within the programme; how well the programme's desired *outcomes* are achieved; and the *impact* of those goals on patient care and health outcomes (Table 1).

The objectives of this study were to carry out a structured literature review to identify existing approaches and tools for evaluating CBE, and to develop an analytical framework for examining the tools found, in order for MEPI schools (and other schools in low-resource settings) to adapt and apply these tools readily for local use.

The study team consisted of the leadership of the MEPI CBE TWG, as well as representatives of, and consultants working with, *CapacityPlus*. The leadership of the TWG consists of a faculty member involved in the oversight and implementation of CBE at the University of Ibadan, and a faculty member involved in CBE research across MEPI schools at the MEPI Coordinating Center, George Washington University.

It was predicted that it would be unlikely that any of the tools could be used in their entirety and without adaptation. The expectation was that the identified tools would generate ideas to assist in the development of programme-specific tools. The intention was that MEPI schools would be assisted to develop some common tools that could be used in a number of schools and countries, as well as enabling comparison of programmes across countries, and that cross-institutional and cross-country CBE evaluation collaborations would develop out of this process.

This article outlines the process of identifying tools that could assist in the evaluation of CBE programmes in participating MEPI schools at all stages of their implementation.

Methods

In order to assist with the evaluation of CBE in participating MEPI-supported schools, a literature search was carried out to identify approaches that might be applicable, and particularly, tools that might be relevant to the African context.

This review started with the screening of the bibliography developed during a systematic literature review for the Community Engaged Medical Education: Systematic Thematic Reviews (CEMESTR) project, a Best Evidence Medical and Health Professional Education (BEME) review (<http://www.bemecollaboration.org/Reviews+In+Progress/CEMESTR/>),

Table 2. Criteria used to categorise the bibliography

Who/what was evaluated (students, faculty, curriculum, health facility, etc.)?
If students were evaluated, indicate the type of student (i.e. medical, dental, nursing, etc.) and their level in school (i.e. pre-clinical, clinical, first year v. final year, etc.)
Where did this evaluation take place (country)?
What evaluation framework or design was used?
What evaluation tool was used?
Is a copy of the tool used in this evaluation published and available?
Where it is not described/published, should the tool be requested?
What indicator/s was/were used to measure success of the CBE programme?
What was the level of success documented for this evaluation?
What is the relevance of the evaluation to CBE in Africa?
<small>Categorisation according to the Kirkpatrick Model of Program Evaluation</small>
<small>http://www.kirkpatrickpartners.com/OurPhilosophy/TheKirkpatrickModel/tabid/302/Default.aspx</small>

with the permission of the principal investigator. One author (IC) was a volunteer reviewer in the CEMESTR project. The bibliography contained 418 sources of literature. It was selected because it was the output of an extensive recent search of Medline, CINAHL, Web of Science and ERIC databases with a range of search terms related to CBE. Articles in the bibliography that had 'evaluation' OR 'evaluating' were selected.

This was combined with further search of English language academic and peer-reviewed literature as well as grey literature and appropriate web-based resource sites. The terms used in the search included community-based, community-oriented and community-engaged medical and health science education; Africa and the names of African countries; and variations of the term evaluation, such as 'evaluate', evaluation tools and evaluation frameworks. These terms were searched through PubMed, Google Scholar, Best Evidence Medical Education, and several relevant websites, such as the Sub-Saharan African Medical Schools Study (SAMSS) website.

A total of 37 relevant articles published between 1985 and 2013 were identified using these two processes.

A matrix to evaluate the usefulness of the articles in relation to the objectives of the study was then developed by the study team. In order for the authors to assess the potential value of the published evaluations

Table 3. The Kirkpatrick Four-Level Training Evaluation Model^[6]

Evaluation type (what is measured)	Evaluation description and characteristics	Examples of evaluation tools and methods
Level 1: Reaction	Measures reaction, how the programme is received by participants (how they feel about the programme and whether it is a valuable experience)	Feedback forms, verbal reaction, post-training surveys or questionnaires
Level 2: Learning	Measures what the participants have learned (how much has the knowledge increased as a result of the specific learning objectives; has there been a change to knowledge, skills, or attitude?)	Pre- and post-test assessments before and after key aspects of the course (e.g. a community rotation). Can involve written exams, interviews or observations of behaviour
Level 3: Behaviour	Measures how far the participants have changed their behaviour, based on the training they received (how information is applied)	Observation and interviews over time are required to assess change, relevance of change, and sustainability of change. Typically occurs 3 - 6 months post training while the trainee is performing the job
Level 4: Results	Measures the final results or outcomes that occur as a result of the programme	Measures are already in place via normal management systems and reporting

for MEPI schools, the matrix included what was evaluated, who were the subjects of the evaluation, where the evaluation took place, the design of the evaluation framework used, indicators used to measure success of the CBE programme, the relevance of the evaluation to CBE in Africa, and the level of the evaluation in relation to the Kirkpatrick four-level model of programme evaluation,^[6] namely: level 1 – Reaction; level 2 – Learning; level 3 – Behaviour; and level 4 – Results (Tables 2 and 3). These criteria were then used to categorise the 37 articles.

Articles were then screened to determine if they specifically included the tools used for the evaluation in the study conducted. Where no tool was published, but the tool was considered to be of possible relevance, attempts were made to contact the author/s to request copies of the tool(s). All tools that could possibly be useful to MEPI schools for CBE evaluation, as well as tools that evaluated the programmes on the levels identified as areas for development for the MEPI schools, were included in a compendium, to serve as a resource toolkit. (Available at <http://www.capacityplus.org/files/resources/mepi-compedium-of-tools-for-evaluating-community-based-medical-education-evaluation-programs.pdf>)

Results

Of the tools considered relevant, those that could be sourced or were available in the published version, eight sets of tools were found to be suitable and included in the final compendium for use. Some evaluations included more than one tool, and/or were described in more than one article. Fig. 1 outlines the process for reaching this compendium.

The eight tool sets, listed in Table 4, represented work from five different areas, namely

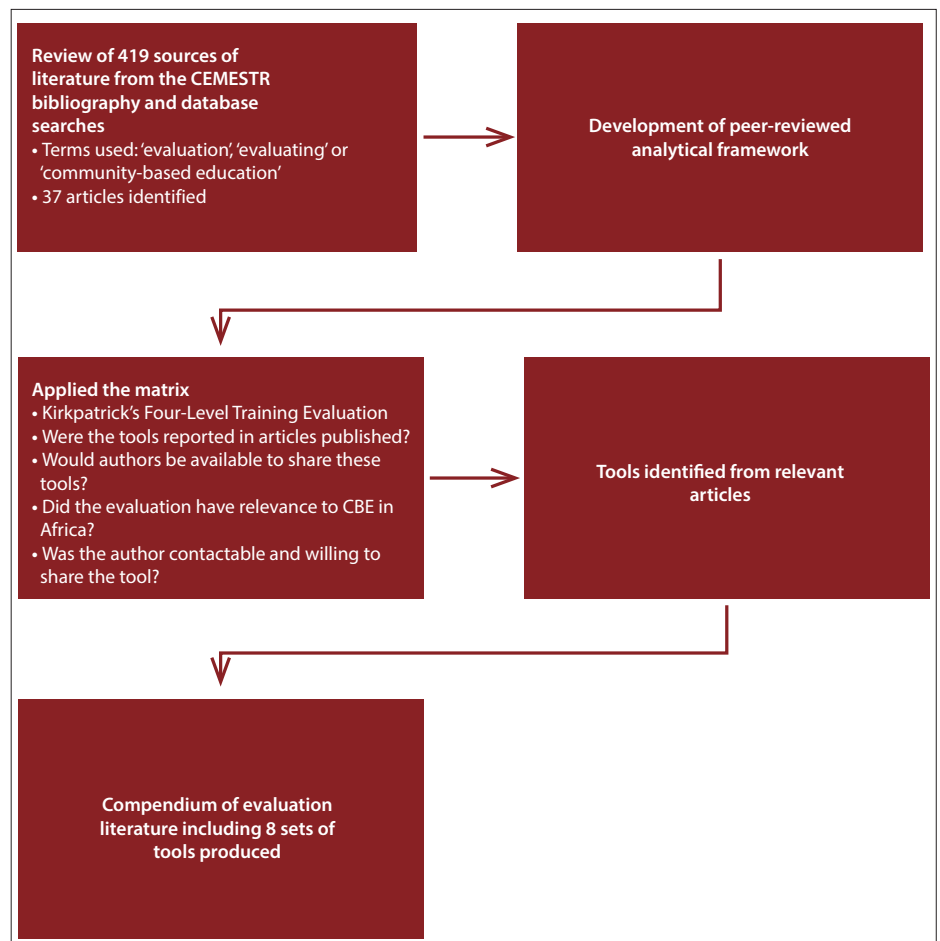


Fig. 1. The process for identifying tools.

USA (University of North Texas; Baylor College of Medicine, Texas; Northwestern University, Illinois), Africa (Jimma University, Ethiopia; Makerere University, Uganda), Australia (University of Western Sydney), South Africa (University of Cape Town) and Asia (National

Taiwan University College of Medicine). All the tools were pre- and/or post-activity evaluations of the programme/project by students, faculty, and stakeholders (supervisors or mentors) covering mostly levels 1 and 2 of the Kirkpatrick model (Table 3).

Table 4. Tools included in the compendium

Identified tool	What was evaluated?	Kirkpatrick Model level	Stage in a logic model evaluation framework	Type of tool	Outcome for evaluation
Birden & Wilson, 2012 ^[7]	Survey completed by students as part of mixed methods evaluation	Level 1: Reaction Level 2: Learning	Activities Intermediate outcomes	Likert-type scales, as well as yes-no responses. Focus groups were conducted to collect some qualitative data, making this evaluation a mixed method.	Learning that took place during placement and meeting the learning outcomes
Community-based education and service (COBES) at Makerere University, 2011-2012 ^[8-11]	A comprehensive evaluation to evaluate the COBES programme through confidential internet and paper-based surveys of the students, tutors, and faculty participating in the COBES programme	Level 1: Reaction	Activities	Quantitative internet-based survey tools (for students, tutors and faculty, respectively) and some of the more qualitative tools (questionnaire for medical and nursing graduates, and interview schedules for key informant interviews with site supervisors and community informants) are specific tools each with its separate areas of evaluation clearly developed to collect the data required for the COBES programme.	This evaluation has provided useful information to identify strengths and weaknesses of the programme, highlight areas for improvement, and provide important needs assessment data.
Dehaven <i>et al.</i> , 2011 ^[12]	Two instruments were completed: Pre- and post-questionnaire to assess student satisfaction with programme. Questionnaire to assess improvement of research knowledge (evaluating curriculum)	Level 1: Reaction Level 2: Learning	Activities Intermediate outcomes	Likert scale (1 = not favourable; 5 = very favourable) checklist evaluating the programme, project, and mentor. The students assessed the curriculum pre and post to rate the level of knowledge by indicating on a scale of 1 - 5 (1 = not knowledgeable; 5 = very knowledgeable) across 14 curriculum variables.	To evaluate activities in the curriculum which were geared towards improving research knowledge. Variables included: I am able to develop appropriate data collection instruments, I am familiar with the components of community-based participatory research.
Huang & Malinow, 2010 ^[13]	A checklist that students completed as a pre-pathway and post-pathway self-assessment of their knowledge, skills, and attitudes regarding delivery of healthcare, barriers to healthcare, resources, and healthcare policy as it impacts underserved care.	Level 1: Reaction Level 2: Learning	Activities Intermediate outcomes	7-point Likert-type scale (1 = not very well; 7 = very well) was used	The items on this form were restatements of the learning objectives of the pathway. Students completed an end-of-pathway evaluation to indicate the extent to which their expectations had been met.
Leone-Perkins <i>et al.</i> , 1999 ^[14]	Two instruments were completed: To understand clinical experiences To assess perceptions of effective teaching by clinical preceptors	Level 1: Reaction Level 3: Behaviour	Activities Intermediate outcomes	Likert-scale of 1 - 5 (1 = not at all; 5 = always)	To evaluate the level of student satisfaction during the placement

Continued ...

Table 4. Tools included in the compendium ... (continued)

Identified tool	What was evaluated?	Kirkpatrick Model level	Stage in a logic model evaluation framework	Type of tool	Outcome for evaluation
Leung <i>et al.</i> , 2007 ^[15]	The scores on the Social Attitude Scale (SAS) were correlated with those on the Program Characteristic Scale (PCS), and the Ability Scale (AS). Pre-test SAS evaluated a student's attitude in serving the student's community. Post-test PCS measured the quality of community placement and the academic linkage to community experiences and learning. Post-test AS measured the learners' subjective evaluation of skills acquired from the community service learning programme.	Level 1: Reaction Level 2: Learning	Activities Intermediate outcomes	Questionnaire surveys to collect quantitative data	This measured the students' attitudes towards social service and citizenship, commitment to take up community service, quality of community service learning and skills acquired from the programme. Items with an opposite meaning from the majority of the items in the same dimension were scored in the opposite direction with the highest point for 'strongly disagree'.
Naidu <i>et al.</i> , 2012 ^[16]	Post-placement questionnaire	Level 1: Reaction Level 2: Learning	Activities Intermediate outcomes	Questions were specific to research projects carried out during the placement. A five-point Likert-type scale (1 = not confident; 5 = extremely confident) was used.	Assessed students' opinion and their confidence on how valuable their experience of their placement was in meeting the learning outcomes
Salmon & Keneni, 2004 ^[17]	This instrument evaluated students' views of their CBE learning	Level 2: Learning	Activities Intermediate outcomes	A list of statements, in terms of the environment, learning experience and objectives. A five-point Likert scale was used (SA = strongly agree, A = agree, U = undecided, D = disagree, SD = strongly disagree). Quantitative, descriptive survey design, using a single anonymous questionnaire was able also to collect qualitative data using open-ended questions.	Explored factors affecting learning and the extent to which the programme objectives were met

*Reported in a number of articles including Chang *et al.*,^[8,11] Kaye *et al.*,^[9] and Mbalinda *et al.*^[10]

The eight tools included in the compendium focused on mainly capturing students' reaction to the CBE activities using Likert scale responses. The tools are mainly quantitative or semi-quantitative. Many CBE evaluations used mostly or entirely qualitative approaches involving in-depth interviews, focus group discussions, etc. Usually, the qualitative questions were context-specific, and it was felt that it would not be useful to replicate these; in almost all cases, such questions were described in the original publications. A number of the tools were related to student assessment more than programme evaluation, but this distinction was not always easy to make.

Discussion

This review revealed three key findings regarding evaluation approaches and tools used for CBE. Firstly, while most of the evaluations were qualitative, published tools made use of Likert-scale data collection in varying forms to collect largely quantitative data. Secondly, most tools evaluated Kirkpatrick level 1, the reaction from students about their thoughts and experiences. Level 2 (learning) was also evaluated but level 3 (behaviour) and level 4 (results) were not explored. Finally, when compared with a logic model evaluation framework, the approaches and tools selected for the compendium focus primarily on the measurement of activities and intermediate outcomes (Tables 1 and 3).

The fact that very few evaluation tools were found is noteworthy. This indicates on the one hand that those working in this field are struggling to find or develop appropriate approaches and tools for the evaluation of CBE for health professional students. It may be that we need to look beyond the confines of health professions education to other disciplines engaged in CBE. On the other hand, it may also indicate that CBE programmes are highly context specific, and thus developing common tools that can be shared across programmes is not a reasonable goal; the argument in response to that would be that there are similar programmes in similar contexts around the world that would have sufficient commonality to allow cross-evaluation. Ultimately, there are no ready-made, one-size-fits-all tools available, and these have to be developed for particular evaluations. This should encourage like-minded programmes operating in similar contexts to work together in developing tools, as some of the MEPI schools are aiming to do. Agreeing on a few common core variables to be assessed across programmes would be a useful starting point.

Authors of the identified tools were open to sharing their CBE evaluation tools leading to the assumption that this is an open community of practice, an important principle that underlies the ethos of CBE. This provides a basis for sharing of efforts in this regard, towards improving the quality of CBE evaluation.

The focus of evaluation in the reviewed tools was on how students are doing or how students and faculty feel about the programmes, rather than evaluating programmes from a community perspective. One question that could be posed is whether patients were cared for differently (wherever the student might be working) as a result of the CBE. It is important furthermore that evaluations of CBE include behaviour change in students (taking it beyond the response level) and impact on the communities served, which would go beyond simply ascertaining the community's perspective.

This review highlights the critical need to develop outcome and impact evaluations. These may be at different levels, including the effect of CBE on students' career choices, on health services and on the workforce in the context of the CBE. These are key elements in the objectives stated for CBE, yet they are seldom evaluated. The MEPI schools are embarking on a study to look at the perceived effect of CBE on health services, across a number of countries, but longer-term measures should be put in place to answer the difficult question of the fulfilment of the outcome and impact objectives of CBE programmes.

The participants in these evaluations were mainly medical students, with a few involving nursing, dental and pharmacy students, leading to the question of whether these tools are validated for use in other professional disciplines. Many other health professional programmes include CBE, yet there are few evaluation reports of these that could be identified in the literature search. This raises the challenge of replicability across health professional education programmes that engage in CBE, and the need to have a multidisciplinary approach to developing tools, especially when a range of professions use common sites for their programmes.

The use of Likert scales in tools is a limitation as it offers a one-dimensional scale from which the respondents are required to choose one option that best aligns with their view. The Likert scale does not force the participant to take a stand on a particular topic, making it difficult to gather the true reflection. With the scales, only a few options are offered, and some of the respondents may not agree with any of the options provided. There is a need to balance the collection of quantitative and qualitative data. Likert scales, which are commonly used as a measurement to assess attitudes, beliefs and opinions, limit the evaluations to remain in level 1 (reaction) in the Kirkpatrick model. This emphasises the importance of carefully selecting the set of questions or statements to reflect fully what is being evaluated.

As identified by the participating schools, it is important to evaluate the programme comprehensively. This means that attention should be placed on reviewing the programme goals, the resource inputs, activities, tangible outputs, outcomes of the activities, and the impact of these activities (Table 1). As indicated, the reviewed tools evaluated only the activities and the intermediate outcomes.

It is interesting that the review led us back to one of the MEPI schools, Makerere University in Uganda, which developed tools that were included in the compendium (Table 4). They made use of qualitative responses as well as quantitative tools, to gauge perceptions of students, tutors, faculty and community informants. However, they also did not go beyond Kirkpatrick level 1, reinforcing the need to develop other tools.

In terms of the compendium, the tools provide useful examples and models on which the development of evaluation tools can be based. It is unlikely though that any can be used without modification for the context. Also, the fact that a tool has been published is not indicative of its validity and reliability. Very few of the articles reported on any process for assessing validity and reliability, and even where these have been assessed, adaptation and/or use in another context would limit the value of these.

Conclusion

This study revealed the lack of evaluation tools and studies available for CBE in Africa. Given the continued investment in CBE to achieve desired goals in health workforce training, there is a need for strengthening evaluation and developing tools. That said, CBE goals and the questions required to evaluate their achievement vary across countries and programmes. Common tools would thus need to be developed regionally or according to the type of programme. Further study, both qualitative and quantitative, is needed to understand better the effects of CBE and to identify successful evaluation strategies and tools for low-resource settings.

References

- Haile Mariam D, Sagay AS, Arubaku W, et al. Community-based education programs in Africa: Faculty experience within the Medical Education Partnership Initiative (MEPI) Network. *Acad Med* 2014;89:550-554. [<http://dx.doi.org/10.1097/ACM.0000000000000330>]
- Kaye DK, Muhwezi WW, Kasozi AN, et al. Lessons learnt from comprehensive evaluation of community-based education in Uganda: A proposal for an ideal model community-based education for health professional training institutions. *BMC Med Educ* 2011;11:7. [<http://dx.doi.org/10.1186/1472-6920-11-7>]
- Talib ZM, Baingana RK, Sagay AS, van Schalkwyk SC, Mehtsun S, Kiguli-Malwadde E. Investing in community-based education to improve the quality, quantity, and retention of physicians in three African countries. *Educ Health (Abingdon)* 2013;26(2):109-114. [<http://dx.doi.org/10.4103/1557-6283.120703>]
- Magzoub ME, Schmidt HG. A taxonomy of community-based medical education. *Acad Med* 2000;75(7):699-707.
- Strasser R. Community engagement: A key to successful rural clinical education. *Rural Remote Health* 2010;10:1543. www.rrh.org.au
- Kirkpatrick DL. *Evaluating Training Programmes: The Four Levels*. San Francisco: Brett-Koehler, 1994.
- Birden HH, Wilson I. Rural placements are effective for teaching medicine in Australia: Evaluation of a cohort of students studying in rural placements. *Rural Remote Health*. 2012;12:2167. www.rrh.org.au
- Chang LW, Kaye D, Muhwezi WW, et al. Perceptions and valuation of a community-based education and service (COBES) program in Uganda. *Med Teach* 2011;33(1):e9-15. [<http://dx.doi.org/10.3109/0142159X.2011.530317>]
- Kaye D, Mwanika A, Burnham G, et al. The organization and implementation of community-based education programs for health worker training institutions in Uganda. *BMC Int Health Hum Rights* 2011;11(Suppl 1):S4. [<http://dx.doi.org/10.1186/1472-698X-11-S1-S4>]
- Mbalinda SN, Plover CM, Burnham G, et al. Assessing community perspectives of the community based education and service model at Makerere University, Uganda: A qualitative evaluation. *BMC Int Health Hum Rights* 2011;11(Suppl 1):S6. [<http://dx.doi.org/10.1186/1472-698X-11-S1-S6>]
- Chang LW, Mwanika A, Kaye D, et al. Information and communication technology and community-based health sciences training in Uganda: Perceptions and experiences of educators and students. *Inform Health Soc Care* 2012;37(1):1-11. [<http://dx.doi.org/10.3109/17538157.2010.542530>]
- Dehaven MJ, Gimpel NE, Dallo FJ, Billmeier TM. Reaching the underserved through community-based participatory research and service learning: Description and evaluation of a unique medical student training program. *J Public Health Manag Pract* 2011;17(4):363-368. [<http://dx.doi.org/10.1097/PHH.0b013e3182214707>]
- Huang WY, Malinow A. Curriculum and evaluation results of a third-year medical student longitudinal pathway on underserved care. *Teach Learn Med* 2010;22(2):123-130. [<http://dx.doi.org/10.1080/10401331003656611>]
- Leone-Perkins M, Schnuth RL, Lipsky MS. Students' evaluations of teaching and learning experiences at community- and residency-based practices. *Fam Med* 1999;31(8):527-572.
- Leung KK, Liu WJ, Wang WD, Chen CY. Factors affecting students' evaluation in a community service-learning program. *Adv Health Sci Educ Theory Pract* 2007;12(4):475-490.
- Naidu CS, Zweigenthal V, Irlam J, London L, Keikelame J. An evaluation of university of Cape Town medical students' community placements in South Africa. *Afr J Prm Health Care Fam Med* 2012;4(1):448. [<http://dx.doi.org/10.4102/phcfm.v4i1.448>]
- Salmon K, Keneni G. Student nurses' learning on community-based education in Ethiopia. *Educ Health (Abingdon)* 2004;17(2):172-182.