

## The Implementation Fidelity of Competency Based Curriculum for Nursing and Midwifery Programme in Tanzania: A protocol for a Mixed Methods Study

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### ABSTRACT

**Background:** Competency Based Education and Training (CBET) curriculum has been successfully implemented globally. In Africa, it was implemented in South Africa since 1998. In Tanzania, implementation of CBET curriculum started in 2005 with Ministry of Education and Vocation Training. In the Ministry of Health, Community Development, Gender, Elderly and Children (MoHCDGEC) adapted CBET curriculum since 2008.

During ten years of the implementation of CBET curriculum for nursing and midwifery, the government of Tanzania has made various interventions to support its implementation. Despite these interventions there is no information on how CBET curriculum for nursing and midwifery is being implemented since its adaption in 2008, and major revision in 2017. Thus, the balance between the designed and implemented curriculum is yet to be established. This lack of curriculum implementation information significantly limits interpretation of the effectiveness of the curriculum for the intended programme.

**Objective:** To explore the implementation fidelity of the CBET curriculum for Nursing and Midwifery among nurse educators in Tanzania.

**Methods:** Descriptive cross sectional concurrent mixed method design will be employed, whereby both qualitative and quantitative methods will be used. About 215 nurse educators will be randomly selected to administer questionnaires. Descriptive and inferential statistics will be used to analyze data and measures of central tendencies. Univariate analysis and regression will be used to test the relationship between independent and dependent variables. Statistical significance will be set at P value of  $\leq 0.05$  and level of confidence interval will be at 95%. In qualitative approach purposeful sampling approach will be used to reach key informants. The principle of saturation will determine the sample size. All interviews will be recorded and transcribed verbatim. Thematic framework will be used to analyze the data, the Nvivo 10 software will be used to generate coding system.

**Conclusion:** There is no information on the implementation fidelity of the CBET curriculum for nursing and midwifery programme in Tanzania. The study will establish the degree of implementation fidelity of the Competency Based curriculum for nursing and midwifery training in Tanzania.

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## Keywords

Competency Based Curriculum, Curriculum Implementation, Implementation fidelity, Nursing and midwifery training.

## Background

Competency Based Education and Training (CBET) has received much interest globally due to its perceived potential in producing competent graduates required by the labor market [1]. CBET can be traced back to the education of primary and vocational teachers in the USA in the 1970s. Poor learning in vocational education programs was the reason for applying new principles to teacher education [2]. In Africa, competence-based curriculum was adopted for the first time in South Africa in 1998 as a response to acute shortage of competent professionals including engineers, technicians and artists but also to cope with challenging issues in the 21st century [3].

In 2005 Tanzania introduced Competency Based Education and Training in primary and secondary schools. In 2008, the Ministry of Health Community Development, Gender, Elderly and Children (MoHCDCGEC) introduced a CBET for health professionals. The shift from KBET to CBET system was influenced by Tanzania Vision 2025, the National Health Policy of 2007, and Sustainable Development Goal no.4 which emphasizes the quality of education [4]. The Vision 2025 advocates production of a reasonable quantity and quality people equipped sufficiently with knowledge, skills and attitudes to meet the challenges of development at local and international levels [5]. The National Health Policy emphasizes on quality, accessible, affordable and equitable health services [6]. Furthermore, the Sustainable Development Goal no.4 advocates for equitable quality education and promotes lifelong learning opportunity for all [5].

The adaptation of CBET system was expected to improve the quality of nursing and midwifery services by enabling learners to develop the required competencies relevant to the health needs of the country and beyond. According to standards laid down by the National Council for Technical Education (NACTE) Act [7] and policy URT [8] stipulated that the curriculum can be used for a maximum period of 5 years to accommodate changes and updates. The nursing and midwifery curriculum was revised in 2017 to align with NACTE standards.

The Government carried out various interventions to ensure that the CBET curriculum for nursing and midwifery is implemented effectively. These include, training of nurse educators on the implementation of CBET curriculum. Furthermore, the MoHCDCGEC prepared standardized training materials to complement the implementation of the CBET curriculum for nursing and midwifery. The skills laboratories were established to ensure students acquire the required nursing and midwifery competencies. Nurse educators were oriented on training materials for effective implementation of the CBET curriculum for nursing and midwifery.

Moreover, infrastructures were refurbished to provide conducive

learning and teaching environment. Despite of these intervention, there has been no any assessment to ascertain whether the CBET curriculum for nursing and midwifery is implemented with fidelity [9]. In the Nursing and Midwifery curriculum, nurse educators are the main curriculum implementers, while students, parents, and clinical instructors are directly or indirectly involved in the implementation process.

Implementation fidelity refers to the extent to which programmes are implemented as it was intended by the programme developer. Implementation fidelity has been defined by different authors in different fields. Original definition provided by Carrol et al., [10] refers to the degree to which an intervention or programme is delivered as intended. In this study implementation fidelity means the commitment and extent to which nurse educators adhered to the designed CBET curriculum for nursing and midwifery.

The achievement or failure of the program is commonly determined by curriculum implementation [11]. The successful implementation of the curriculum is ruled by many things; implementation fidelity is one of them [10]. It is only by exploring how curriculum is being implemented that policy makers and training officers can gain a better understanding of how and to what extent they can make improvement [9].

Asebiomo [12] argues that no matter how well the curriculum is designed and developed, assessing its implementation fidelity is very crucial. Research has shown that the curriculum implemented with high fidelity have more of an effect with respect to the programme product than low fidelity. Finney & Jerusha [13] asserts that, deviations from the original curriculum may involve shortening class sessions, changing the mode of curriculum delivery, adding extraneous information out of competencies stipulated in the original curriculum, lack of motivation of nurse educators and insufficient time provided for the programme implementation.

The implementation fidelity study has been a topic of interest and researched in various fields. Despite that, a review of literature focused on implementation fidelity for nursing and midwifery programmes revealed no reference mention the implementation fidelity for nursing and midwifery training programme in Tanzania.

## Study Aim

The aim of this study is to investigate the implementation fidelity of Competency Based Curriculum for nursing and midwifery programme in Tanzania.

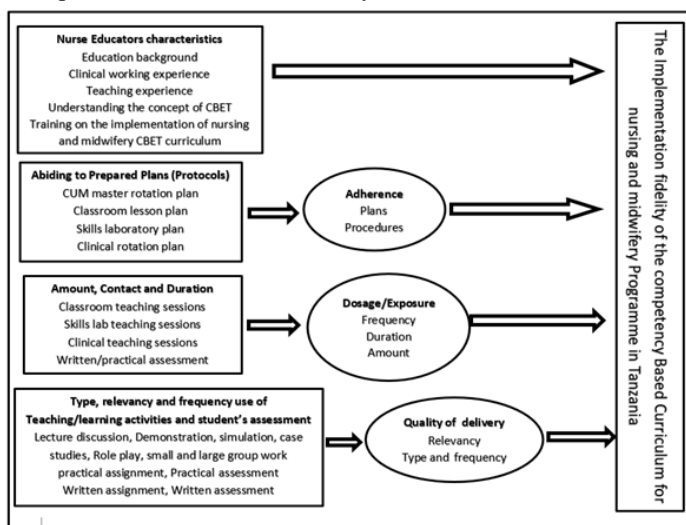
## The conceptual framework of the study

Carroll et al., [10] proposed implementation fidelity conceptual framework with five elements to give understanding of the implementation of the programme. The modified implementation fidelity conceptual frame work will be used to investigate the implementation fidelity of CBET curriculum for nursing and midwifery programme. The change implies the additional of nurse educators' characteristics and modification of three elements;

adherence, dosage and quality of delivery.

Thus, adherence in this study relates to abiding to the procedures and protocol of implementing CBET curriculum for nursing and midwifery while dosage refers to the amount, duration and frequency of contact for achieving what was intended. On the other hand, quality of delivery refers to the frequency, type and relevancy of applying participatory teaching and learning methods during delivery of sessions. These elements must be treated together for better understanding of the curriculum implementation fidelity [10].

The implementation fidelity conceptual framework will facilitate the evaluation of the implementation fidelity of the Competency Based Curriculum for nursing and midwifery programme in Tanzania. The figure 1 summarizes the key elements of the conceptual framework of this study.



**Figure 1:** Conceptual framework for implementation fidelity of Competency Based Curriculum for nursing and midwifery programme in Tanzania.

CBET: Competency Based Education and Training; CUM master rotation plan: is the whole plan of rotation of all learners in a specific educational institution, showing the placement of the learners belonging to total programme.

### Study design and approach

Descriptive cross sectional concurrent mixed method design will be employed, where both qualitative and quantitative methods will be used to investigate the implementation fidelity of CBET curriculum for nursing and midwifery among nurse educators in Tanzania. Data collection for both qualitative and quantitative studies will be done at approximately the same time, from different samples and the integration will occur during interpretation of the data [14,15]. The mixed method research would generate depth and breadth information regarding implementation fidelity of the CBET curriculum for nursing and midwifery from different perspectives thus increase validity and reliability of findings [14,16]. The findings from the qualitative study will corroborate

findings of the quantitative study and thereof understand the implementation fidelity of Competency Based Curriculum for nursing and midwifery programme from nurse educators.

This study will be carried out in the Nursing and Midwifery training schools in Tanzania. There are about 94 nursing and Midwifery schools receiving students from all over the country. Among them, 29 are private, 34 Faith Based Organization and 31 government owned schools. All nursing and midwifery schools are implementing CBET curriculum for nursing and midwifery programme approved by Tanzania Nurses and Midwifery Council (TNMC) and National Council for Technical Education and Training (NACTE).

### Population and eligibility criteria

Population for this study will include nurse-educators in the selected nursing and midwifery schools in Tanzania. Inclusion criteria for the quantitative study will include nurse educators with a minimum of three (3) years of teaching experience implementing nursing and midwifery CBET curriculum. Whereas for the qualitative study, nurse educators with experience of not less than 5 years of implementing CBET curriculum for nursing and midwifery will be considered. Experienced nurse-educators will provide depth and breadth information regarding implementation fidelity of the CBET curriculum for nursing and midwifery.

### Sample size and sampling procedure

#### Quantitative study

Simple random sampling strategy [17,18] will be used to select 215 nurse educators from nursing and midwifery schools using the random number generator software. The involved nursing and midwifery school (Government, Private and FBOs) will be known up on random selection of nursing educators. Then, the selected nurse educators will be followed at their school premises where they teach for completion of the questionnaire. The head of the school will assist in identifying nurse educators who have been randomly selected to complete the questionnaire.

#### Qualitative study

To ensure that participants with rich information are obtained [19], purposeful sampling a non-probability sampling technique will be used to recruit 20 nurse educators [20,21]. However the principle of saturation will guide the sampling process as for the qualitative study the sample size is not predetermined [16]. Nurse educators with teaching experience of five years and more will be selected to participate in the study. The head of the nursing school will assist in identifying nurse educators who have been teaching in the schools of nursing for 5 years or more. The aim, objective and the study procedure will be explained to the participants and those who would agree to take part in the study will be requested to provide written consent. Thereafter, time for interview will be set.

### Research Instruments and Data Collection

#### Self-administered questionnaire

The modified questionnaires from the United States assessed proficiencies of learners in the field of Science, Technology,

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Engineering and Mathematics (STEM) will be used [22]. The questions are modified to suit nursing and midwifery programme in the context of Tanzania. To explore the implementation fidelity of competency Based curriculum for nursing and midwifery programme, the questionnaire covers the information on educators' characteristics, Adherence, dosage and quality of delivery.

The researcher acknowledges the important of validity concept in quantitative research, therefore to establish validity of the questionnaires first will be reviewed by experts for clarity, formatting, acceptable response options, content and wording. Again, up on receiving ethical clearance the researcher will take a pilot study for consistence and data collection time estimate.

Prior filling of questionnaire, the informed written consent form will be issued. After signing the informed consent nurse educators will be requested to complete the questionnaire independently without using any reference. During data collection, the researcher and trained Research Assistants (RA) will supervise nurse educators when completing the questionnaire and make clarification during the process when need arise. Before living the room, the research team will check for completeness of the questionnaire and count to validate the number of questionnaires received against participants. Upon completion the Research Assistants will collect the completed questionnaires. The questionnaire will be stored in a safe place and will be accessible only by the research team.

### **Semi-structured interview guide**

The semi-structured interview guide will be used to collect data from nurse educators [23]. The semi structured interview based on a pre-prepared topic will guide the data collection [20]. Interview with nurse-educators implementing CBET curriculum for nursing and midwifery from the selected nursing and midwifery schools will be conducted. Participants will share their experiences and perception on the implementation fidelity of CBET curriculum for nursing and midwifery programme.

### **Rigor of the qualitative study**

Trustworthiness will be established by ensuring strict participation of only nurse educators who are implementing nursing and midwifery CBET curriculum [24]. This will be strictly adhering to the selection criteria. Dependability will be ensured by allowing for the process of data generation and analysis to be audited [21].

### **Conducting the Interviews**

Semi structured interview will be conducted in a quiet room at the school premises where nobody will overhear the discussion. The interview will be conducted not more than one hour per session.

### **Document audit fidelity checklist**

Document audit fidelity checklist will be used to review documents retrospectively such as CUM master rotation plan, session plans, skills laboratory, clinical rotation schedules, and students' academic assessment reports. The observation will focus on the availability of the teaching and learning activities schedules, their alignment with the designed nursing and midwifery CBET curriculum and

adherence.

### **Research assistants**

Research assistants with experience in health and education related research will be recruited. Prior to the actual fieldwork, research assistants for both quantitative and qualitative data collections will undergo two-days training conducted by the researcher. The training will comprise an overview of the present study and familiarization of interview guides. Research assistants will be introduced to research ethics and administrative issues such as work schedule, how to take field notes (non-verbal expressions) and other logistics. During the fieldwork, there will be daily feedback meetings between the researcher and research assistants after interviews to evaluate the work and to discuss if encountered any problems from the field. This will ensure the quality of data gathered. For the objectivity of this study, during the interview of nurse educators the researcher will not be involved fully to avoid information biases and possible influence of participant's responses. This is because a researcher is coordinating the Nursing and Midwifery training programme at the MoHCDGEC-Head office. Further, the researcher has been intensively involved in the process of development and revision of the CBET curriculum for nursing and midwifery programme, development of standardized training materials, training tutors on the implementation of the CBET curriculum and introducing skills laboratories to support nursing and midwifery schools. However, will conduct auditing of the documents, coordinate and facilitate daily meetings after data collection from the field.

### **Data analysis**

#### **Qualitative data analysis**

The Thematic analysis method as described by Braun and Clark [25] will be used for qualitative data analysis and the Nvivo 10 software will be used to generate coding system. Prior to the start of the analysis, the audio-recorded interviews will be transcribed precisely word for word (verbatim), where non-verbal cues will also be taken into account in the transcriptions. The analysis will involve listening to the recorded interviews, reading and re-reading of the interview transcripts to have general understanding of the participants' accounts about their experiences and perceptions on the implementation fidelity of CBET curriculum, generating initial codes, searching for themes, revising the themes, and defining and naming themes.

#### **Quantitative analysis**

Analysis will be done using Statistical Product and Service Solution (SPSS) (version 24). The questionnaires will be checked for entries and its completeness, then coded and categorized before entering into SPSS statistical software. Further, data capture screen for educators' questionnaires will be prepared. Descriptive and inferential statistics will be used to analyze data and measures of central tendencies (Mean, Median, and Mode). Univariate analysis and regression will be used to test the relationship between independent and depend variables [26]. Statistical significance will be set at P value of  $\leq 0.05$  and level of confidence interval will be at 95%.

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## Ethical Considerations

Ethical approval sought from the Research and Publication Committee of University of Dodoma (UDOM). Permission to conduct the study in the Nursing and midwifery schools and review of documents will be obtained from MoHCDGEC. Further, Informed consent will be obtained from the participants before their participation. Participants will be briefed about objectives and procedures of this study and that they have the right to agree or disagree to participate, or withdraw from the study at any time if they think so. Special permission will be required from informants to audio-record information they provide during the interview. Participants will be made clear that information they provide, whether orally or in writing, will be treated with strict confidentiality. Participants names will not be used but designated numbers and the material collected (including hand written notes, transcripts, checklist and tapes) will be locked into a cabinet to which only the research team will have access. Consent to adapt the tools was granted by authors.

## Discussion

The aim of this study is to investigate implementation fidelity of CBET curriculum for nursing and midwifery programme in Tanzania. Implementation fidelity of the curriculum is defined as how well curriculum is being implemented in comparison with the original design [27]. The intention is to empirically assess the balance between the designed curriculum and implemented curriculum. The implementation fidelity conceptual frame work Carrol et al. [10] has been modified by author to include nurse educators characteristics in the study framework. Nurse educators will be assessed on three level of nursing and midwifery CBET curriculum implementation; Adherence to protocols and procedures, Dosage/exposure and Quality of implementation [10]. The educator's characteristics is added in the conceptual frame work to establish the association between dependent and independent variables.

This study is very important to inform policy makers, implementers and training officers on the level of implementation fidelity for better understanding of the strengths and challenges. Hence, make possible improvement.

## Conclusion

There is no information on the implementation fidelity of the CBET curriculum for pre service nursing and midwifery programme in Tanzania. The study will establish the degree of implementation fidelity of the CBET curriculum for nursing and midwifery programme in Tanzania. Furthermore, it will provide valid inferences to interpret the effectiveness of the nursing and midwifery CBET curriculum for the intended programme.

Three elements (Adherence, Dosage and quality of delivery) will be treated together for better understanding of the implementation fidelity for nursing and midwifery CBET curriculum in Tanzania. The association of nurse educators' characteristics with the implementation fidelity for nursing and midwifery CBET curriculum will be established. Final analysis will be done to

benchmark the level of implementation fidelity for nursing and midwifery CBET curriculum among nurse educators.

In adherence, the results will illustrate how much nursed educators were able to adhere to the procedures and protocol as per designed curriculum. Dosage will inform on the duration and amount of sessions delivered by nurse educators in relation to the sessions planned in a curriculum. Quality of delivery will depict the frequency, type and relevancy of applied teaching and learning methods as stipulated in the intended curriculum. Studies have shown that the implementation with fidelity have an impact with respect to the programme. On the other hand, the implementation with low fidelity caused by adding more information or shortening sessions than what is planned in the curriculum [13,28].

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## References

1. Boahin P. Competency-Based Training CBT in higher education towards an implementation in Ghanaian polytechnics Peter Boahin. 2014.
2. Deißinger T. Structures and functions of Competency-based Education and Training CBET a comparative perspective. Beiträge aus des praxis der beruflichen bildung. 2011.
3. Parker B, Walters S. Competency based training and national qualifications frameworks Insights from south africa. Asia Pacific Educ. 2008; 9: 70-79.
4. NACTE. Professionalising Competence-based Education and Training CBET through Enhancing a Professional Dimension. 2015.
5. URT. Tanzania Development Vision 2025. 1999; 1-31.
6. MoHSW. National Health Policy. 2007.
7. NACTE. The National Council for Technical Education Act. 1997.
8. URT. The Technical Eduaction and Training Policy in Tanzania. 1996.
9. Bümen NT, Çakar E, Yildiz DG. Curriculum Fidelity and Factors Affecting Fidelity in the Turkish Context Nilay. Educ. Sci. Theory Pract. 2014; 14: 219-228.
10. Carroll C, Patterson M, Wood S, et al. A conceptual framework for implementation fidelity. Implement. Sci. 2007; 2: 40.
11. Ogar OE. Teachers Perceived Problems of Curriculum Impementation in Tertiary Institutions in Cross River State of Nigeria. 2015; 6: 145-152.
12. Asebiomo AM. Teachers assessment of integrated science Curriculum in Federal Capital Territory Abuja for effective implementation. J. Curric. Stud. 2009.
13. Finney SJ, Jerusha JG. Measuring the Implementation Fidelity of Student Affairs Programs Acritical Component of the Outcome Assessment Cycle. 2013; 15-28.
14. Leech NL, Anthony J. Onwuegbuzie. A typology of mixed methods research design. Qual. Quant. 2009; 42: 265-275.

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15. Baker SE, Edwards R. How many qualitative interviews is enough Natl. Cent. Res. Methods Rev. Pap. 2012; 1-42.
  16. Creswell JW. Research Design Qualitative Quantitative and Mixed methods Approaches. Sage Publication Inc. 2003.
  17. Polit DF. Nursing Research: Generating and Assessing Evidence for Nursing Practice. 2008.
  18. Gravetter FJ, Forzano LB. Research Methods for the Behavioural Sciences Cengage Learning. 2011.
  19. Suri H. Available from Deakin Research Online Purposeful Sampling in Qualitative Research Synthesis. Qual. Res. J. 2014; 11: 63-75.
  20. Dahlgren L, Emmelin M, Winkivist A. Qualitative Methodology for international Public Health. Umea Epidemiology and Public Health Science. Department of Public Health and Clinical Medicine. Umea University. 2004.
  21. Dahlgren L, Emmelin M, Winkivist A. Qualitative methodology for international public health Umea Epidemiology and Public Health Sciences. Umea University. 2007.
  22. Powers S, Hughes M. ERIC FOI Report 10. 2015.
  23. Kyale S. An introductory to Qualitative Research Interviewing. SAGE. 1996.
  24. Graneheim UH, Lundman B. Qualitative content analysis in nursing research Concepts procedures and measures to achieve trustworthiness. Nurse Educ. Today. 2004; 24: 105-112.
  25. Braun V, Clarke V. Using thematic analysis in psychology. Qual. Res. Psychol. 2006; 3: 77-101.
  26. Julie P. SPSS Survival Manual A step by step guide to data analysis using SPSS for windows Version 12. Open University Press. 2005.
  27. Davis D. Fidelity of Implementation Teacher Perspectives and Child Outcomes of a Literacy Intervention in a Head Start Program A Mixed Methods Study. 2014.
  28. Bo Wang, Bonita Stanton, Lynette Deveaux, et al. Factors influencing implementation dose and fidelity thereof and related student outcomes of an evidence-based national HIV prevention program. Implement. Sci. 2015; 10: 44.