
AN ASSESSMENT APPROACH FOR COMPETENCY-BASED NURSING EDUCATION IN A LOW-INCOME COUNTRY

By

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DECLARATION

“I, Eva Mukurunge, declare that the interrelated, publishable manuscripts thesis that I herewith submit for the Doctoral Degree in Nursing at the University of the Free State, is my independent work, and that I have not previously submitted it for a qualification at another institution of higher education”.

Eva Mukurunge

November, 2023

DEDICATION

In loving memory of my mother, Thandiwe Chikumbirike. This is for you, Mother.

ACKNOWLEDGEMENT

I want to express my sincere appreciation to everyone who assisted me during my PhD journey.

I wish to make a special mention to the following who made this study a reality.

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"Education is our passport to the future, for tomorrow belongs to the people who prepare for it today." —Malcolm X

ABSTRACT

Background: Nursing education institutions in Lesotho were directed by the government to adopt a competency-based curriculum, which required a paradigm shift in assessment methods

from traditional to programmatic assessment. However, the implementation of the new assessment approach faced several challenges. Firstly, most nurse educators were unfamiliar with programmatic assessment since it was not included in their formal nursing training. Secondly, during the preparatory stages of programmatic assessment implementation, nursing training institutions could financially afford the initial training opportunity for nurse educators by the assessment experts, which, unfortunately had no follow up trainings. Lastly, unclear programmatic assessment implementation guidelines and a lack of support posed challenges to most of the institutions.

Purpose: The study sought to develop a contextually relevant assessment approach for competency-based nursing education in a low-income country.

Methods: The development of the assessment approach was guided by multiple methods, which were informed by the Design Science Research methodology. The approach was developed through a multi-phased process. In the first phase, a mapping review was conducted to synthesise literature on the various assessment approaches that have been used in health professions education since the year 2000. The second phase involved engaging with nurse educators to describe the contexts of the nursing education institutions in Lesotho where programmatic assessment was implemented. In the final phase, the findings from the first two phases were used to develop a contextually relevant assessment approach, which was then validated by a panel of assessment experts.

Results: The outcome of this study was a contextually relevant assessment approach for competency-based nursing education in a low-resource countries.

Conclusion: To successfully implement educational innovations, it is important to have a clear understanding of the context of nursing education institutions. This enables the development of relevant implementation strategies that take into account the specific needs and challenges of the institution. Moreover, the development of educational innovations should be based on scientific methodology and should incorporate strategies that have been proven to work. Nursing education institutions in low-income countries need to take an active role in developing contextually relevant educational innovations, rather than relying solely on innovations developed in high-income countries.

Keywords: Competency-based education; Delphi; Design Science' Low-income country; Nursing education institutions; Programmatic assessment

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LIST OF ABBREVIATIONS

CBE	Competency-based education
CBNE	Competency-based nursing education
DSR	Design-science research
GNI	Gross national income
HICs	High-income countries
HPE	Health Professions Education
LMICs	Low-and-middle-income countries
MCQ	Multiple-choice questions
NEIs	Nursing education institutions
NEPI	Nurse Education Partnership Initiative
OSCE	Objective structured clinical examinations
PA	Programmatic assessment
RIME	Reporter-to-interpreter, to-manager/educator
SAQ	Short answer questions
TEMM	A model consisting of four assessment methods: the Triple Jump Test, essay incorporating critical thinking questions, Multi-station Integrated Practical Examination, and multiple-choice questions
WHO	World Health Organization

CONCEPT CLARIFICATION AND OPERATIONAL DEFINITIONS

This section presents the definitions of key terms that appear in the title, which describe the focus of the study conceptually and operationally. The terms are in alphabetical order.

Assessment approach

An assessment approach is a set of theories and principles that reflect a particular model used in the implementation of assessments in an educational programme (Lockyer, Carraccio, Chan, Hart, Smee, Touchie, Holmboe, Frank & ICBME Collaborators, 2017). In this study, an assessment approach will refer to the set of theories and principles used in implementing assessment in an educational programme.

Competency-based education

Competency-based education is a pedagogical approach that is student-centred and directed at the student demonstrating that they have learned knowledge, attitudes and skills expected of them as they progress through their education (Frank, Mungroo, Ahmad, Wang, de Rossi & Horsley, 2010; Kabanga, Mugimu, & Oonyu, 2018). The acquisition of competencies should enable the student to function independently and effectively in the provision of healthcare (Kabanga, Mugimu & Oonyu 2018). In this study, competency-based nursing education will refer to a pedagogical approach that is student-centred and is focused on nursing students attaining the correct and essential knowledge, attitudes and skills.

Low-and middle-income countries

The World Bank has grouped the economies of the world into four main categories according to their gross national income (GNI). Two of these four groups are *low-income countries and middle-income countries*. The middle-income category comprises lower-middle-income and upper-middle-income countries (World Economic Forum, 2020; World Bank, 2020). Countries that fall in the low-income group have a GNI per capita of \$1,035 or less. Countries that fall in the lower-middle-income group have a GNI per capita of between \$1,036 to \$4,045. Upper-middle-income countries have a GNI per capita of \$4,046 to \$12,535 (The World Bank, 2021). In this study, the concept of low-income countries will be applied as described by the World Bank.

PREAMBLE

This thesis follows the recommendations for a PhD through publishable interrelated articles, as presented by the Faculty of Health Sciences at the University of the Free State, South Africa. The format requires the submission of a collection of publishable or published articles that are interrelated, along with introductory and summary chapters.

This thesis comprises five chapters. The first chapter introduces the study's purpose and methodology. The following three chapters are interrelated articles, written according to the submission guidelines of selected journals. The last chapter of the study includes the main findings, recommendations, and limitations of the research.

The contribution of the researcher for each manuscript is indicated, along with the details of the journals where the manuscript was submitted and its current status. The researcher followed all research processes diligently, which included planning, conducting, and preparing the research for examination.

The first chapter of this thesis provides a detailed explanation of the methodology used to develop the assessment approach. The manuscripts that follow provide abridged versions of specific aspects of the methodology, as required by the journals. Since the manuscripts are interrelated and contribute to the development of the overall framework, there may be some repetition of concepts and issues throughout the thesis.

It is important to note that the three manuscripts included in this thesis have been formatted according to the requirements of the journals to which they will be submitted. Therefore, there may be differences in font, line spacing, and headings among the articles. In the first and last chapters of this thesis, 7th edition of the American Psychology Association (APA) referencing style was used as the primary referencing style. Each chapter has its own reference list, which reflects the references used in constructing its content. Noteworthy is that the author guidelines for the accompanying addenda will be specific to each manuscript based on the specifications of the chosen journals.

SCHOLARLY CONTRIBUTIONS FROM THIS STUDY

Objective	Phase in the study	Contribution for this work
1.To describe the characteristics of the different assessment approaches in undergraduate health professions education through a mapping review.	Phase 1: Mapping review	Mukurunge, E., Hugo-Van Dyk, L & Nyoni, C.N. 2023. Assessment approaches in undergraduate health professions education: Towards the development of feasible assessment approaches for low-resource settings. Submitted to the journal: BMC Medical Education
2. Explore the assessment context at the selected NEIs which implemented a competency-based curriculum in Lesotho.	Phase 2: Semi-structured interviews	Mukurunge, E., Hugo- Van Dyk, L & Nyoni, C.N. 2023. Context of competency-based assessment in nursing education in a low-income country Submitted to the journal: Assessment and Evaluation in Higher Education
3. Develop, critique, refine and validate an assessment approach for competency-based nursing education for a low-income country.	Phase 3: Modified e-Delphi	Mukurunge, E., Hugo-Van Dyk, L & Nyoni, C.N. 2023. An assessment approach for competency-based nursing education in a low-income country: A consensus study.

		For submission to the Nurse Education in Practice Journal
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1. OVERVIEW OF THE STUDY

“Change is the end result of all true learning.” — Leo Buscaliga

CHAPTER 1

OVERVIEW OF THE STUDY

1.1. Introduction

This chapter is an introduction to the structure and outline of this thesis. Firstly, it explains the motivation behind the research study by describing the relevant context and problem. Then, it discusses the research methods used in the study. Finally, the chapter concludes by providing an overview of the entire thesis, including a summary.

1.2. Background

The World Health Organization (WHO), through the WHO Commission of Health Professional Education, advocates for curricular reforms that are competency-based in order to increase human resources for health who are competent to provide services in an ever-evolving disease context (World Health Organization, 2022; Muraraneza & Mtshali, 2018). Competency is the ability to manage a professional problematic situation using relevant knowledge together with appropriate skills, attitudes, and metacognitive abilities. The integration of knowledge, skills, attitudes, and metacognitive abilities is collectively known as competence (Cate, 2017; Schuwirth & Van der Vleuten, 2019). According to the American Association of Colleges of Nursing competency-based education refers to a system of instruction, assessment, feedback, self-reflection, and academic reporting that is based on students demonstrating that they have learned the knowledge, attitudes, motivations, self-perceptions, and skills expected of them as they progress through their education (Lewis, Rebesch, & Hunt, 2021). Frank and colleagues defined CBE in terms of four overarching themes which are: outcomes should be explicitly outlined in the curriculum; the competencies that the students should have to be clear; the curriculum should de-emphasize on time-based training allowing students to progress at their own pace; there should be learner-centredness so that students take responsibility for their own learning (Frank et al., 2010). Therefore, health professions education (HPE) institutions globally are adopting the competency-based education (CBE) approach (Ross, Hauer & van Melle, 2018). HPE institutions encompass all healthcare professions including but not limited to dentistry, pharmacy, nursing and medicine. Competency-based education emphasises a paradigm shift of pedagogical practices from teacher-centred to student-centred approaches (Cheptoo, 2019) and builds on a constructivist paradigm. Hence, students construct their

knowledge based on existing knowledge as they actively engage in the learning process (Cheptoo, 2019). Competency-based education is a pedagogical approach that focuses on student attainment of the competencies applicable in a continually changing work environment (Van der Vleuten & Schuwirth, 2019).

The implementation of the CBE approach requires the transformation of all processes in the systems of education institutions, which include the adoption of new forms of assessment that comprehensively assess all facets of competence, re-training of educators, a different classroom order, more time for administration and management, and the development of new learning resources (Muraraneza & Mtshali, 2018; Lockyer, Carraccio, Chan, Hart, Smee, Touchie, Holmbe & Frank, 2017). Most of the reported assessment strategies associated with the CBE approach are predominantly from high-income countries, and appear to be resource-intensive. These assessment strategies may not be reproducible in low- and middle-income countries (LMICs), which may further compromise competence attainment within the CBE approach (Cheptoo, 2019).

According to Norcini, Anderson, Bollela, Burch, Costa, Duvivier, Hays, Mackey, Roberts and Swanson (2018), a “good assessment framework” should guide assessment. This framework outlines the elements of a good assessment as validity, reliability, equivalence, feasibility, educational effect, catalytic effect, and acceptability (Norcini et al., 2018). Validity is the ability of the assessment method to measure what it intends to measure as outlined in the learning outcomes (Rundle, 2016). Reliability refers to the reproducibility of the assessment in obtaining identical results in different settings under similar circumstances (Rundle, 2016). Equivalence is the quality of the assessment to yield similar results when administered in different institutions (Norcini et al., 2018). Feasibility is associated with the practicality of implementing the assessment. A feasible assessment method is realistic and sensible in a particular context (Norcini et al., 2018). Good assessments should have an educational effect on students resulting in students who are motivated to learn in order to succeed in the assessment (Norcini et al., 2018). A catalytic effect is a feature of good assessments when results are coupled with constructive feedback for all concerned stakeholders to create, augment and support education (Norcini et al., 2018). Credible assessment processes should be followed to yield results which are acceptable to all stakeholders (Norcini et al., 2018).

Implementing curricular reforms in high-income countries might be more feasible because of an enabling context (Bisgaard, Rubak, Rodt, Petersen & Musaeus, 2018). In Canada, at the

Queen's University School of Medicine, the implementation of the CBE approach was reported as successful because of the following enabling factors; a relatively small number of students, the presence of specialised assessment experts who offered support to academic staff, a collegial environment, a centralised funding system, outstanding information technology resources, a state of the art clinical simulation centre, a shared educational vision with the leadership of the institution, stakeholder involvement, input from other departments in the university that had already successfully implemented CBE, a centralised governance structure and educational consultants that supported the programme. The Queen's University School of Medicine successfully introduced a programmatic assessment (PA) strategy guided by a change process to measure students' attainment of competencies (Gadnone, Stockley, Flynn, Egan, Van Wylick, McEwen, Walker & Reznick, 2019). In addition, some HPE institutions in high-income countries are still searching for cost-effective CBE implementation strategies (Weller, Naik & Diego, 2020).

The African education context can impede the implementation of the CBE approach, including associated assessment approaches due to a number of barriers, which include a lack of clarity on curriculum reforms, unavailability of required instructional resources, politics, financial capabilities, infrastructure, leadership, the level of preparedness of the students, and failure of the administration to recognise and understand its role in the adoption of the CBE approach (Bvumbwe & Mtshali, 2018^a; Bvumbwe & Mtshali, 2018^b; Cheptoo, 2019).

Lesotho, which is the study context, falls into the low-income category and therefore the listed challenges are more imminent. Five East African countries namely, Burundi, Kenya, Rwanda, Tanzania, and Uganda, signed the East Africa Harmonization of Higher Education accord, which requires signatories to adopt the CBE approach in Nursing and Midwifery education (The Aga Khan University, 2016). However, it seems as if feasibility factors were not considered during the adoption of the CBE approach in the five East African states. Health professions education institutions in Tanzania and Kenya for example, struggled with the adopted assessment strategies due to insufficient financial resources and a lack of expertise (Cheptoo, 2019).

Some African countries have adopted the CBE approach with some level of success (Kiguli-Malwadde et al., 2014). Examples include the University of Ibadan in Nigeria and Makerere University in Uganda. Their success was attributed to the development of academic staff in terms of giving feedback, teaching, and assessment methods. Most of their academic staff

members underwent training in HPE at the master's degree or fellowship level. The University of Ibadan and Makerere University have set up faculty development departments to support faculty in the successful implementation of CBE. (Kiguli-Malwadde et al., 2014). The two universities employed multiple assessment methods to measure the attainment of student competencies (Kiguli-Malwadde et al., 2014). The availability of support from partners such as the Medical Education Partnership Initiative (MEPI) guided the acquisition of infrastructure and funded faculty development workshops on teaching and assessment methods contributed to the successful implementation of the CBE approach (Kiguli-Malwadde et al., 2014). Despite all the developments in the two universities to enhance the implementation of CBE, their assessment strategies appear not to completely align with the programmatic assessment approach, which is strongly advocated for in CBE (Olapade, Adaramoye, Raji, Fasola & Olapade-Olaopa, 2016). Therefore, there is need for more training in assessment in CBE to improve implementation (Mc-Kenzie-White, Mubuuqe, Westergaard, Munabi, Bollinger, Opoka, Mbalinda, Katete, Manabe & Kiguli, 2022)

In a bid to improve the quality of nursing, midwifery and medical education in some African countries, the government of the United States of America established the Nurse Education Partnership Initiative (NEPI) and MEPI five-year grant in 2011 (ICAP Global, 2016; Middleton, Howard, Dohrn, Von Zinkernagel, Hopson, Aranda-Naranjo, Hall, Malata; Sewankambo & Donkor, 2018). The NEPI grant aimed to build capacity among nurse educators in these African countries, improve learning and teaching infrastructure, implement innovative teaching methods and curriculum reforms, and offer student scholarships. Curriculum reforms that were initiated by NEPI led to a shift in education towards competency-based education and assessment approaches that are aligned with the new curriculum model (Nyoni & Botma, 2020; Cheptoo, 2019; Bvumbwe & Mtshali^b, 2018).

Advancements in assessment models to align with various and newer curriculum models have led to the development of, among others, the programmatic assessment approach which is quite resource-intensive (Ellis & Hoggard, 2016; Schuwirth & Van der Vleuten, 2019), the integrated assessment (Van Zyl & Massyn, 2008), authentic assessment (Strakova, 2016) and the sustainable assessment strategy (Rhodes University, 2015: 3; Mutch, 2012). Implementation of these assessment approaches may not be feasible or transferable in the low-income country context or in nursing education.

1.3. The context

Lesotho is the focus of this study. Lesotho was one of the six African countries that partnered with the NEPI (Michaels-Strasser, Smith, Khanyola, Sutton, Price & Sadr, 2018). The six African countries included the Democratic Republic of the Congo, Ethiopia, Lesotho, Malawi, South Africa, and Zambia. According to the national strategic development plan of Lesotho (2012/13-2016-17), the government planned to enhance the foundation of skills development by improving and instituting appropriate curricula to enhance best practices in teaching and learning (The Government of Lesotho, 2012). The introduction of the NEPI programme in Lesotho in 2012 was a positive development towards the achievement of this strategic goal. NEPI was established to build capacity in nursing education institutions (NEIs) in order to implement international best practices in pre-service nursing and midwifery education. NEPI supported the six NEIs in Lesotho with the enhancement of infrastructure in the form of equipped clinical skills laboratories, computer laboratories, libraries, vehicles, and prefabricated buildings to expand teaching and learning spaces (Michaels-Strasser et al. 2018). In addition, all the six NEIs in Lesotho, like all other partners of NEPI in Africa were supported in curricula reforms towards CBE. There was faculty development in terms of new methods of teaching, clinical instruction, preceptorship, and e-learning. Institutions were also capacitated in the management of programmes and donor funding. Nursing education institutions received training and mentorship to implement new and revised curricula, implementation of innovative teaching and learning methods, and appropriate assessment methods for CBE (Michaels-Strasser et al. 2018).

Implementation of the innovations in teaching and learning has not been easy for the NEIs in Lesotho for various reasons. Four of the six NEIs in Lesotho were established by churches. These church-owned nursing schools were initially administered from their sister mission hospitals and lacked financial independence under the hospital administration. The remaining two NEIs are government-owned. However, the four church-owned nursing schools liberated themselves from the financial ties they had with their sister hospitals. Their freedom regarding financial administration freedom allowed them to manage and implement revised curricula, innovative teaching and learning methods, and the appropriate assessment methods under the guidance and support of NEPI. Unfortunately, the closing of the NEPI programme meant that the financial support received by the NEIs was cut. This, according to Bvumbwe and Mtshali

(2018^a), to some extent, put a financial strain on the institutions to sustain the resource-intensive innovative curricula that had been established.

The competency-based curricula that were established in NEIs in Lesotho were coupled with the programmatic assessment (PA) approach. Programmatic assessment is a system of assessment that combines multiple low-stakes assessment activities to counteract the weaknesses of single assessment activities but also to provide a holistic overview of the performance of the student over time. The longitudinal accumulation of low-stakes assessments will enable reaching an informed decision by assessors for progression or certification. Programmatic assessment allows for student-centeredness in the provision of feedback thus enhancing self-directed learning (De Jong, Bok, Schellekens, Kremer, Jonker, Van, Der Vleuten, 2022). The PA approach is resource-intensive to implement (Schut, Maggio, Heeneman, Tartwijk, Van der Vleuten & Driessen, 2021), rendering it unsustainable for financially incapacitated NEIs. According to Nyoni & Botma (2019), there is a drift towards traditional assessment methods in NEIs in Lesotho. However, traditional assessment methods fall short of fully assessing the competence of students (Lockyer et al., 2017).

1.4. Problem statement

The adoption of CBE and its associated PA approach has posed a challenge in implementation for most low-income countries (Shrivastava & Shrivastava, 2018). The NEPI was a catalyst for curricular change towards CBE in some African countries, like Lesotho (Cheptoo, 2019). The termination of the NEPI support left the resource-limited country and its NEIs stranded with limited capability to sustain the resource-intensive PA approach associated with CBE (Bvumbwe & Mtshali, 2018^a; Bvumbwe & Mtshali, 2018^b). In addition, some institutions have no structures to support staff in implementing PA strategies. The inability to sustain the resource-intensive PA approach has forced some NEIs to drift back to traditional assessment methods which are not aligned with CBE (Khaahloe, 2008).

In Lesotho, the closing of the NEPI programme left five of the six NEIs compromised in the implementation of CBE and its associated PA approach. Records from inter-nursing schools meeting minutes in Lesotho have revealed various factors that pushed the NEIs to revert to the traditional methods of assessment (Christian Health Association of Lesotho, 2022). Consequently, results from the national nursing licensure examinations have revealed that students from the one school that has been motivated to implement PA in assessing students

and had its competency-based nursing programme fully accredited by the Council on Higher Education (CHE) (2017), perform better than students from the other five NEIs (Lesotho Nursing Council, 2021). This evidence suggests that poor assessment approaches compromise the quality of nursing graduates. Therefore, there was a need for the development of an assessment approach for competency-based nursing education (CBNE) for institutions in low-income countries such as Lesotho.

An assessment approach that is more feasible to use in low-income countries is ideal for the improvement of the assessment of the acquisition of competencies by nursing students. Therefore, the developed assessment approach would, to some extent, lead to improved assessment methods and training of more competent nurses, able to competently tackle the disease burden in low-income countries.

1.5. Research questions

This study was guided by the following research question:

- What would be an appropriate assessment approach for competency-based nursing education in a low-income country?

1.6. The aim and objectives

The study aimed to develop an assessment approach for competency-based education in a low-income country.

To achieve this aim, the objectives were to:

- a) Describe the characteristics of the different assessment approaches in undergraduate health professions education through a mapping review,
- b) Explore the assessment context at the selected NEIs which implemented a competency-based curriculum in Lesotho, and
- c) Develop, critique and validate an assessment approach for competency-based nursing education in a low-income country.

1.7. The paradigm of the research

A paradigm is a shared belief system that influences the way in which researchers collect and interpret data (Brierley, 2017). A pragmatic paradigm guided this study. The pragmatic

paradigm is a worldview that focuses on finding solutions to problems in the contexts from which the problems and their solutions emanate (Revez & Borges, 2018). Maarouf (2019) posits that a pragmatic paradigm is when researchers seek solutions that work, using action-oriented research procedures. In this study, challenges associated with the implementation of the PA approach in CBNE in Lesotho have been identified. Practical solutions to the identified challenges can be generated and decided on by the implementors of the CBNE in low-income country. Therefore, the research process focused on the problem statement as the determinant of the ontology, epistemology, methodology, and axiology to be used in the study (Revez & Borges, 2018).

1.7.1. Ontology of this study

The ontological basis of the pragmatic paradigm is that there is an intersubjective stance towards reality. In pragmatism, one reality is believed to exist in a particular context coupled with multiple interpretations at an individual level (Maarouf, 2019). In this study, there is an understanding that reality is ever-changing according to human experience. The assessment approaches associated with CBE in low-income countries have posed several challenges, including financial challenges during implementation. The candidate believed that the experiences around the implementation of the PA approach in the NEIs in Lesotho could be used in this study for the design of a more feasible assessment approach.

1.7.2. Epistemology

The epistemological stance in the pragmatist paradigm is to have two perspectives on knowledge which are subjective and objective knowledge depending on the ontological stance of the researcher (Maarouf, 2019). The phased multi-method approach that was utilised in this study allowed both subjective and objective data to meet the set objectives.

1.7.3. Methodology

A pragmatist paradigm allows the researcher to choose multiple methods that will enable them to meet the set objectives (Reves & Borges, 2018). This study followed a phased multi-methods approach (Brewer & Hunter, 2006) underpinned by design-science research (DSR) to achieve the set objectives.

1.7.4. Axiology

Axiology refers to the values that are attributed to the different aspects of research (Kivunja & Kuyini, 2017). The pragmatic paradigm has a value-laden axiology in terms of the participants, data, and recipients of the research results (Kivunja & Kuyini, 2017). In this research, the broad ethical principles of beneficence and non-maleficence, distributive justice, and respect for persons (Resnik, 2012) were applied. Furthermore, the candidate ensured that all aspects of the study would abide by the ethical considerations as outlined by the Health Sciences Research Ethics Committee of the University of the Free State (Health Sciences Research Ethics Committee, 2022).

1.8. Research design

This study followed a phased multi-methods approach (Brewer & Hunter, 2006) underpinned by DSR. The DSR underpinned the three phases of this study in the development of an assessment approach. Design Science Research is a research design adopted from the field of information technology. The aim of DSR is to develop artefacts that will solve real-life problems while contributing to the knowledge base (Venable, Pries-Heje & Baskerville, 2012; Weber, 2012). The aim of the study was to develop an appropriate assessment approach for CBNE in a low-income country. Figure 1.1 illustrates how the DSR approach guided the study.

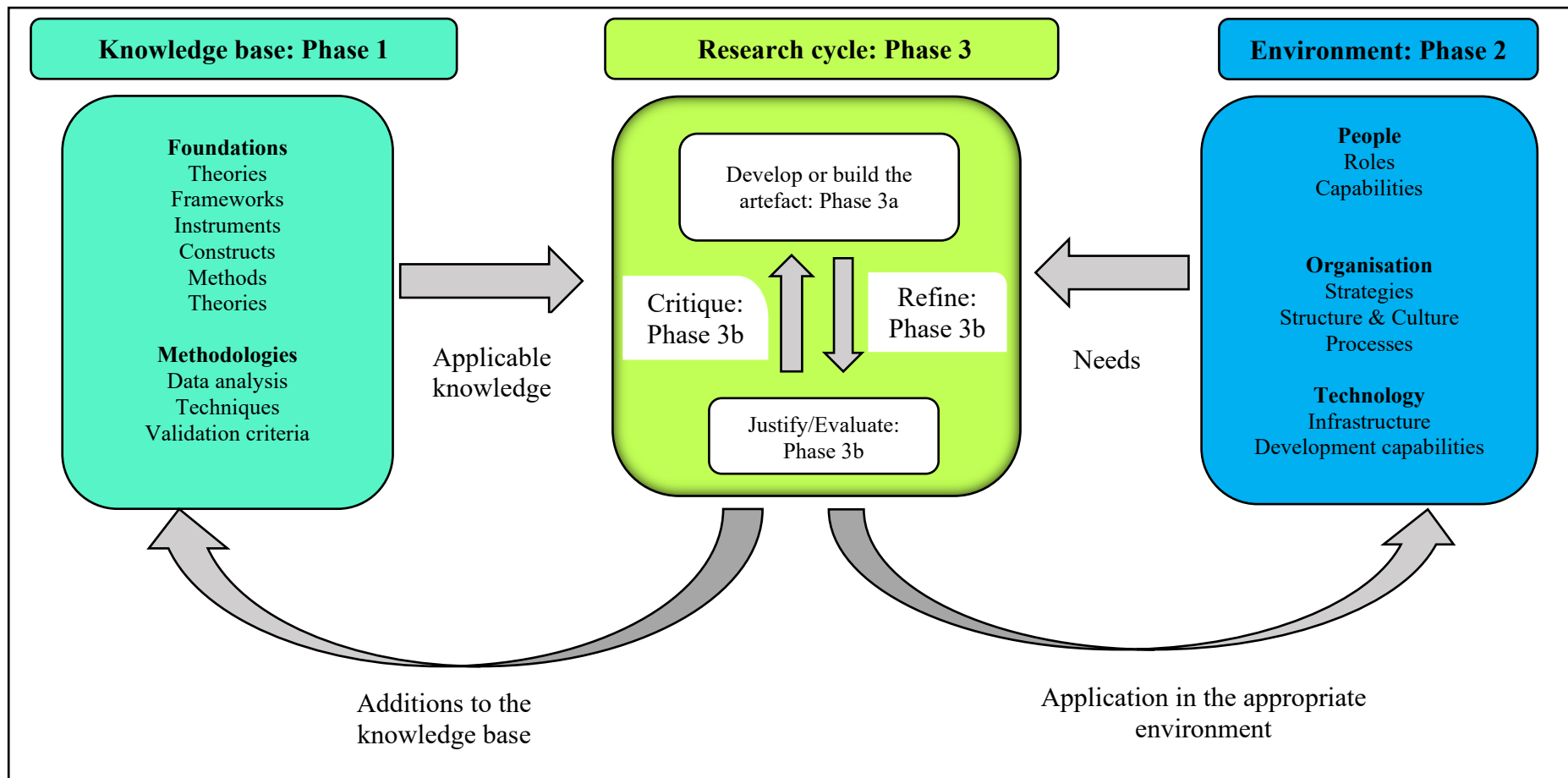


Figure 1.1: Design Science Research method for the development of the assessment approach, adapted from Weber (2012)

1.8.1. Research design of the study

The DSR design has three domains which are the environment, the research cycle, and the knowledge base. This study had three phases, which were superimposed on the three domains of the DSR. In Phase 1, the characteristics of assessment approaches utilised in health professions education (HPE) were described through a mapping review. Phase 1 was underpinned by the knowledge domain in the DSR as illustrated in Figure 1.1.

Phase 2 was informed by the environment domain of the DSR as shown in Figure 1.1. In Phase 2, data on the various contexts of NEIs in a low-income country were collected using semi-structured interviews. The content of the semi-structured interviews covered components of the environment domain in the DSR. The components include the roles and capabilities of people who work in the NEIs; strategies, processes, structure, and culture of the NEIs at the organisational level; and the infrastructure and developmental capabilities in terms of technology in each institution. According to McKenny and Reeves (2013: 85), awareness of the context of the problem or the natural environment is a critical initial element of the DSR design. In this study, awareness of the problem of the assessment approach in CBNE in a low-income country was extensively described in Phase 2 through structured interviews.

Phase 3 was divided into two sub-phases. In Phase 3a the assessment approach, which is the artefact, was developed by the candidate under the supervision of the two supervisors of the study. In Phase 3b the developed artefact was critiqued and validated by experts through a modified e-Delphi technique. Unlike the original Delphi technique where one-on-one interviews are held sequentially with the selected knowledgeable team members, the modified e-Delphi technique involves gathering the same knowledgeable team members on a conducive electronic platform for a structured discussion where immediate resolutions are made through a consensus (Eubank, Mohtadi, Lafave, Wiley, Bois, Boorman & Sheps, 2016). Phases 3a and 3b were superimposed in the research cycle domain of the DSR, as shown in Figure 1.1. The hallmark of the DSR design is the iterative nature of its processes. As each iteration progresses, investigators continually refine and rework the artefact guided by a variety of research methods that best fit the environment (Rossi, Henfridsson, Lyytinen & Siau, 2013). Design Science Research is based on collaborations among researchers and practitioners in real-world settings, leading to the development of contextually sensitive artefacts (Rossi et al., 2013). In Phase 3b, the panellists, through the modified e-Delphi technique, assessed and refined the artefact in an

iterative process until a 70% agreement was reached (Taze, Hartley, Morgan, Chakrabarty, Mackie & Griffin, 2022). The methods used, and lessons learnt during the development of the artefact, contributed to the knowledge base in the DSR design as shown in Figure 1.1. Table 1.1 summarises the research design of the study.

Table 1.1: Summary of the research design of the study

Research steps	Phase 1 (Article 1)	Phase 2 (Article 2)	Phase 3a (Article 3)	Phase 3b (Article 3)
Objectives	To describe the characteristics of different assessment approaches in undergraduate HPE through a mapping review.	To explore the assessment context at the selected NEIs which implemented a competency-based curriculum in Lesotho in terms of: -the organisational characteristics -technology -the people who work in the institutions.	Develop, an assessment approach for CBNE in a low-income country using evidence gathered from the mapping review and structured interviews	Critique and validate the developed assessment approach for CBNE in a low-income country through the modified e-Delphi technique
Approach or design	Mapping review	Descriptive qualitative design	Collaborative synthesis	Consensus seeking
Population or data sources	Literature on assessment approaches in HPE	Two key nurse educators from four of the NEIs which implemented a competency-based curriculum	- Literature from the mapping review - Data from the semi-structured interviews	- Assessment experts - Experts on CBE
Sampling and sample size	Systematic approach to the selection of literature	Purposive sampling of eight representatives from the four NEIs	Systematic selection of literature	Purposive sampling of 20 panellists
Data collection method	Charting of data from included sources identified in the mapping review using a data collection tool (Addendum D).	Semi-structured interviews using Microsoft Teams	Development of the appropriate assessment approach for CBNE in a low-income country using data gathered from the structured interviews and the mapping review	Modified electronic Delphi technique

Research steps	Phase 1 (Article 1)	Phase 2 (Article 2)	Phase 3a (Article 3)	Phase 3b (Article 3)
Data analysis	Multiple approaches: Integrative descriptive statistics and deductive analysis.	Descriptive data analysis		Iterative statistical analysis of data from the modified electronic Delphi technique.
Outcome	Characteristics of assessment approaches used in HPE	Description of the contexts at selected NEIs in relation to assessment practices	A developed assessment approach for CBNE in a low-income country	A validated assessment approach suitable for implementation in CBNE in a low-income country
Reporting of findings	Publishable article	Publishable article	Publishable article	Publishable article

1.8.2. Phase 1: Mapping review

A mapping review is a secondary type of empirical study that seeks to provide an overview of a research area and establish if research evidence is available on a topic (James, Randall & Haddaway, 2016). Mapping reviews assist in the identification of gaps in the available literature from which further primary or secondary research can originate (Soita, Serin & Preece, 2020; Grant & Booth, 2009; Gough, Kiwan, Sutcliffe, Simpson & Houghton, 2003). Data gathered from mapping reviews do not necessarily provide answers to specific questions but rather enable the collation, description and cataloguing of available evidence on a particular topic (James et al., 2016). The retrieved evidence can include, among others, research types, the country where the research was done, publication platforms of the studies, and the relevant populations (Cooper, 2016; James et al., 2016).

The steps followed in a mapping review are outlined in the guidelines for conducting systematic reviews by the Evidence for Policy and Practice Information and Co-ordinating Centre (EPPI-Centre) (Gough et al., 2003; Preston, Chambers, Campbell, Cantrell, Turner & Goyder, 2018; Salama, Bahsoon & Bencomo, 2017). Figure 1.2 outlines the adopted steps according to the EPPI-Centre which were followed in the mapping review.

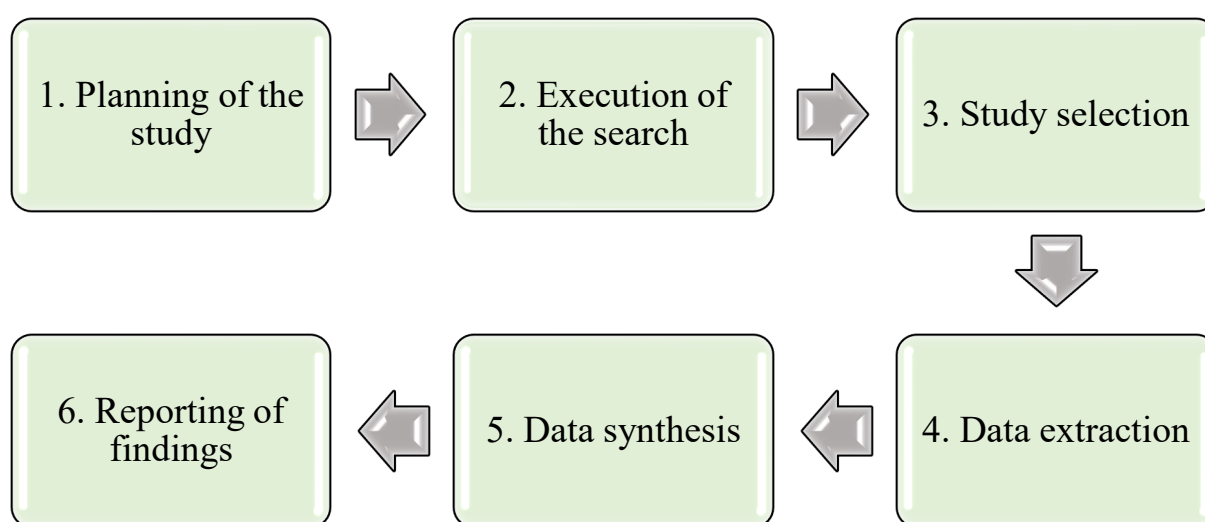


Figure 1.2: Steps of the mapping review.

1.8.2.1. Step 1: Planning for the mapping review

The initial step in undertaking a mapping review is the planning step which is executed by a mapping review team (Felderer & Carver, 2020). The mapping review team in this study consisted of the candidate together with the two supervisors. The mapping review team worked together, with the supervisors guiding the candidate throughout the whole process. Planning entails the mapping review team establishing the need for a review, determining the scope of the review by specifying the research question and inclusion/exclusion criteria, and developing and validating the review protocol (Salama et al., 2017). The purpose of this mapping review was to describe the characteristics of assessment approaches used in undergraduate HPE. A distinct PCC (Population, Concept, Context) question directed the mapping review (Peters, Godfery, Khalil, McInerney, Parker & Soares, 2015; The Joanna Briggs Institute, 2015). Table 1.2 shows how the PCC format was applied to the mapping review question.

Table 1.2: Research question according to the PCC format.

Mnemonic	Application
Population	Undergraduate students
Concept	Assessment models, theories and frameworks
Context	Health Professions Education

The review question was:

“What is known about assessment models, theories, and frameworks in undergraduate health professions education?”

A systematic search strategy is necessary to maximise the number of sources that answer the research question. A systematic search starts with a Boolean search string that is a combination of keywords, truncation symbols, and Boolean operators used to facilitate the search for literature in databases or search engines (Elmira College Gannett-Tripp Library, 2021). The preliminary search string was:

(“Health science” OR “Health professions education” OR “medical education” OR “medical training” OR “nursing education”) AND (“assess *” OR “evaluat*” OR “method or methods” OR “procedure*” OR “techniques*” OR “approaches”*) AND “undergraduate”

1.8.2.2. Pilot or “quick and dirty” search

Before the commencement of the final search, a pilot search was undertaken to determine the feasibility of the search string and rectify any problems. The search string and inclusion criteria were tested to ensure the validity of the search process. The results informed the adjustments on the final search string under the guidance of an information specialist at the UFS.

The preliminary search string was then modified to:

(assess* n2 (model* or framework* or theories or theory)) and (educat* or train*) and (“health profession*” or “health science*” or nurs* or medical or clinical or medicine) and (undergraduate* or baccalaur*) and ti assess*

1.8.2.3. Step 2: The search execution

An information specialist, who is a Librarian at the Health Sciences Library at the University of the Free State searched ten relevant databases, including the following: Academic Search Ultimate, Africa-Wide Information, APA PsycInfo, CINAHL with Full Text, CAB Abstracts, Communication & Mass Media Complete, ERIC, Health Source: Nursing/Academic Edition, MEDLINE, and Sociology Source Ultimate. The information specialist adapted the search string as needed to produce the best outcomes following the review question. Additionally, the information specialist recorded the number of hits per database and the number of sources removed through auto-deduplication.

1.8.2.4. Step 3: Study selection

The mapping review team selected the retrieved studies from the searches against the following inclusion and exclusion criteria.

Inclusion criteria

- Peer-reviewed literature published on assessment approaches, strategies, and methods in undergraduate programmes in HPE.

Exclusion criteria

- Literature that focuses on assessment in organisations, for example, the assessment of organisational performance.
- Postgraduate education
- Assessment in primary and secondary schools
- Outside the field of HPE

The selection of articles based on the inclusion and exclusion criteria was an iterative process that was done independently by members of the mapping review team. Initially, screening was done using titles, then abstracts and finally the full articles. The full articles of the selected abstracts were requested from the UFS Library and Information Services. Finally, the mapping review team reached a consensus on their independent selections through a discussion. See Chapter 2 for more information on the selection, extraction and analysis process that follows.

1.8.2.5. Step 4: Data extraction

Determination of the categories to be used for extracting information from the studies was done by the mapping review team. The candidate conducted the actual data extraction, which was then verified by the two supervisors. The preliminary categories were author, study title, country where the study was carried out, health sciences discipline, and the assessment approach used and its characteristics. Data extraction was guided by the following categories as outlined in the knowledge base of the DSR approach: frameworks, instruments, constructs, methods, theories, and methodologies used which could be data analysis methods, techniques, and validation criteria. The characteristics of the different assessment approaches were documented in a custom-made data extraction form created by the candidate.

1.8.2.6. Step 5: Data synthesis

The mapping review team identified and described the characteristics of the assessment approaches used in undergraduate HPE institutions. Characteristics of the assessment approaches included the philosophies used, assessment methods, restraints, enablers, human resources needed, costs and challenges of the different HPE institutions (Salama, et al., 2017; Cantrell, Croot, Johnson, Wong, Chambers, Baxter & Booth, 2020). The extracted data was synthesised using a stepwise process of data reduction, data display data comparison, data verification, and conclusion (Salama et al., 2017). Data reduction was influenced by the various characteristics of assessment approaches extracted from the literature. Data were compared using the different codes assigned to the identified characteristics of the assessment approaches. In conclusion, the synthesised data were verified against the research question to determine if the findings were in alignment with the research objectives.

1.8.2.7. Step 6: Reporting of findings

A report was compiled in the form of a publishable article, see Chapter 2.

1.8.2.8. Rigour of the mapping review

Rigour was enhanced by using the review guidelines for conducting systematic reviews by the Evidence for Policy and Practice Information and Co-ordinating Centre (EPPI-Centre) (Gough et al., 2003; Preston et al., 2018; Salama et al., 2017). The literature search was conducted in relevant databases. The search strategy that was used in the mapping review was clear which enhanced transparency, clarity, and reproducibility (Bandara, Furtmueller, Gorbacheva, Miskon & Beekhuyzen, 2015). The candidate and the two supervisors aimed to include peer-reviewed papers to enhance the quality of the results of the mapping review results. Data analysis followed a rigorous process to enhance the quality of the results (Bandara et al., 2015). In addition, the candidate kept a paper trail of all the steps followed which included the search strings, databases, number of articles included, number of articles excluded, and also the reasons for exclusion.

1.8.3. Phase 2: Exploration of the assessment contexts at the selected NEIs which implemented a competency-based curriculum in Lesotho.

To develop an artefact that is relevant in its context, there is a need for a thorough exploration of the problem in the context for which the artefact is intended. In Phase 2 of this study, semi-structured interviews were conducted with two key nurse educators from each of the selected four NEIs that implemented a competency-based curriculum in Lesotho, as illustrated in Table 1.3.

1.8.3.1. Purpose

The purpose of Phase 2 was to describe the context of the four selected NEIs in Lesotho that implemented a competency-based curriculum in terms of the roles and capabilities of the people in the NEI; structure, culture, strategies, and processes of the particular NEI; technology in the institutions regarding infrastructure, development and capabilities; and assessment in the institution concerning characteristics, designs, assessment strategies and approaches, and recommendations. This was informed by the environment domain in the DSR design in Figure 1.1.

1.8.3.2. Objective

The objective of this phase was to explore the assessment context at the four NEIs that implemented a competency-based curriculum in Lesotho.

1.8.3.3. Design

A descriptive qualitative design was used. Qualitative descriptive design can be used to describe the characteristics of a sample (Botma, Greeff, Mulaudzi & Wright, 2010).

1.8.3.4. Population and sampling

The population consisted of eight key nurse educators, that is two from each of the four selected NEIs that implemented a competency-based curriculum in Lesotho. The candidate contacted the heads of the four NEIs using the email addresses provided on their institutional websites. The heads of the NEIs directed the candidate to the appropriate individuals who met the inclusion criteria. The two key nurse educators per institution participated in the study representing their institutional structures.

Purposive sampling was used to select two nurse educators from each of the four selected NEIs that implemented a competency-based curriculum in Lesotho. The two key nurse educators, per NEI, assisted in answering questions about their institutions. The inclusion criteria for the selection of participants in Phase 2 are outlined in the next section.

Inclusion criteria

Individuals with in-depth knowledge of the following:

- Assessment approaches and practices utilised in the institution;
- Characteristics of the human resources in the institution in terms of their roles and capabilities;
- The organisational structure and culture, processes, and strategies;
- The technology used in the institution in terms of infrastructure, development, and capabilities.

Table 1.3 illustrates the four NEIs that were included in this study.

Table 1.3: NEIs that implemented a competency-based curriculum in Lesotho.

Country	Name of institution
Lesotho	Maluti Adventist College of Nursing
	Paray School of Nursing
	Roma College of Nursing
	Scott College of Nursing

1.8.3.5. Data collection method

Data were collected through semi-structured interviews. Structured interviews are a method of data collection where the interviewer asks a number of questions compiled in the data collection tool, while probing for clarification where necessary. A total of four semi-structured interviews were carried out online using the Microsoft Teams platform at convenient times for both the interviewees and the interviewer. The data from the structured interviews were used in the development of the appropriate assessment approach for a low-income country in Phase 3a of the study.

1.8.3.6. Data collection tool

The questions in the data collection tool used in the semi-structured interviews were developed using data gathered from the mapping review. Addendum E indicates the questions that were used to guide the interviews. To enhance trustworthiness, the semi-structured interviews, and the development of the data collection tool were guided by the components of the environment domain in the DSR design, as seen in Figure 1.1. The questions in the tool addressed the criteria of good assessments as outlined in Norcini et al., (2018). The two supervisors in this study evaluated the developed data collection tool for content and face validity. The tool was piloted at one of the NEIs in Lesotho to determine its usability (Sürücü & Maslakçi, 2020) before its use in the semi-structured interviews. The results of the pilot were not included in the main study.

1.8.3.7. Data collection process

Before data collection, the candidate recruited and oriented an interviewer regarding the content of Phase 2 of this study including the questions to use in the semi-structured interviews. The candidate obtained permission from the respective NEIs to conduct the study in their institution. Table 1.3 indicates the four NEIs where the semi-structured interviews were conducted. Participants were informed that codes would be used instead of their real names for confidentiality. However, confidentiality was not guaranteed since the two members of staff from each institution were interviewed at the same time. Participants gave verbal consent for the interviews to be recorded. The audio recording was a means of data storage. The recordings were stored in password-protected files in the cloud.

1.8.3.8. Data analysis

The candidate together with a co-coder, analysed the data using the deductive qualitative content analysis method, under the supervision of the two supervisors. The deductive analysis approach was utilised because the three themes of people, organisation and technology in the DSR framework were utilised to inform the semi-structured interviews. Qualitative content analysis refers to the subjective interpretation of qualitative data in an attempt to identify the core meanings and consistencies therein (Roller, 2019). The process of qualitative content analysis involves three main phases, namely the preparation, organization and reporting of the results phases (Elo, Kääriäinen, Kanste, Pölkki, Utriainen, & Kyngäs, 2014). In this study, data were collected using semi-structured interviews in the preparation phase. Codes instead of real names were used for participants during the interviews, for the sake of anonymity. In the organisation phase, data from the semi-structured interviews were coded to create categories. The candidate used MicroSoft Excel program for data analysis. The results of the semi-structured interviews are reported on in a publishable manuscript in Chapter 3.

1.8.3.9. Trustworthiness of the content analysis process

Trustworthiness in qualitative inquiry supports the argument that the findings of the study are accurate (Lincoln & Guba, 1985). Trustworthiness encompasses the credibility, dependability, confirmability, and transferability of the research (Maher, Hadfield, & Hutchings, 2018). Credibility refers to the confidence that is placed in the truth of the research findings (Korstjens & Moser, 2018). To enhance credibility, data collection strategies should be clearly outlined (Shava, Hleza, Tlou, Shonhiwa & Manthosi, 2021). In this study, the questions in the data collection tool were developed by the candidate and verified by the two supervisors of this study. Dependability refers to the consistency of data over time and in different contexts (Elo et al., 2014). All the processes to be followed in the development of the assessment approach were documented, to enable a complete document and decision trail. The presence of such a document and decision trail ensured the dependability of the study. Confirmability is the degree to which the results of the study can be confirmed by other researchers (Korstjens & Moser, 2018). In this study, the candidate under the supervision of the two supervisors analysed the data to identify the categories and sub-categories under the three pre-determined themes. In confirmability, independent individuals should have similar perceptions about the accuracy, relevance, or meaning of the data (Korstjens & Moser, 2018). Transferability refers to the potential of the generalisability of the results to other contexts (Korstjens & Moser, 2018). In this study, trustworthiness was enhanced in all three phases of qualitative content analysis.

In the preparation phase, to establish trustworthiness, the purposive sampling method was used in the selection of participants who were knowledgeable about assessment in their NEI to participate in the semi-structured interviews. The candidate considered self-awareness to minimise bias in the study by refraining from influencing the choice of the two key nurse educators. The data collection tool was piloted to enhance the credibility of the results.

The organisation phase involves the interpretation of the data to identify the categories and sub-categories. Trustworthiness was ensured during interpretation, as data analysis was not done by a single person only. In this study, the candidate together with a co-coder, analysed the data from the semi-structured interviews.

The reporting of the results phase was done systematically to avoid ambiguities and enhance trustworthiness. A report was written to outline the steps that were followed in the content analysis as shown in Chapter 3.

1.8.4. Phase 3: Development, assessment and refining of an appropriate assessment approach for CBNE in a low-income country

The development of an appropriate assessment approach for CBNE in a low-income country was divided into two phases. In Phase 3a, the candidate developed the assessment approach. In Phase 3b, the developed assessment approach went through an iterative process of evaluation and refinement using the modified e-Delphi technique. A panel of assessment experts and experts in CBE were selected to participate in the modified e-Delphi technique.

1.8.4.1. Phase 3a: Development of an appropriate assessment approach for CBNE in a low-income country

In this phase, the student developed an appropriate assessment approach for CBNE in a low-income country.

1.8.4.1.1. The aim of this phase

This phase aimed to develop an appropriate assessment approach for CBNE in a low-income country using results from the mapping review and the semi-structured interviews underpinned by the DSR approach as shown in Figure 1.1.

1.8.4.1.2. Research design

The development of the assessment approach followed a collaborative synthesis approach.

1.8.4.1.3. Population and sampling

The population for this phase was the literature from the mapping review and data from the semi-structured interviews. Purposive sampling of literature using a search string was done in ten databases.

1.8.4.1.4. Data collection

The candidate developed the appropriate assessment approach for CBNE in a low-income country using data gathered from the semi-structured interviews and the mapping review.

1.8.4.2. Phase 3b: Validation and refinement of the developed assessment approach for CBNE in a low-income country

In this phase, the developed assessment approach was critiqued and refined through a modified e-Delphi technique.

1.8.4.2.1. The aim of this phase

This phase aimed to critique and validate the developed assessment approach through a modified e-Delphi technique.

1.8.4.2.2. Research design

A consensus-seeking approach was used in this phase.

1.8.4.2.3. Population and sampling

The population for this phase was individuals involved in assessment and facilitation in a CBE context in low- and middle-income countries. Purposive sampling was used to select 20 panellists for the modified e-Delphi technique. The candidate selected the 20 panellists using the outlined inclusion criteria below. According to Iqbal and Pison-Young (2009), the number of panellists to participate in a modified e-Delphi technique is between 10 and 50. The prospective participants for the modified e-Delphi were contacted using their email addresses as found on their published articles.

The inclusion criteria that were used for the recruitment of the 20 panellists for the modified e-Delphi are outlined in the following section.

Inclusion criteria:

- Nurse educators from low- and middle-income countries with one or more qualification(s) or publication(s) in educational assessment.
- Nurse educators from low- and middle-income countries with one or more qualification(s) or publication(s) in curriculum design and development.

1.8.4.2.4. Data collection

During this phase, the modified e-Delphi technique was employed. The candidate created a Google form, Addendum O, which contained statements from the assessment approach that was developed. Each statement had a "yes" and a "no" option, with an additional section under the "no" response to allow participants to provide reasons for selecting the "no" response. The statements in the developed assessment approach were assessed for their feasibility, authenticity, and validity based on the characteristics outlined in the environment domain of the DSR approach.

The candidate shared the developed assessment approach and the Google form with the panellists of the modified e-Delphi technique who were blinded to each other. The modified e-Delphi technique was administered online and comprised two rounds with controlled feedback until a 70% consensus was reached (Hong, Pluye, Fabregues, Bartlett, Boardman, Cargo, Dagenais, Gagnon, Griffiths, Nicolau, O’Cathain, Rousseau & Vedel, 2019; Taze et al., 2022). Each round of the modified e-Delphi technique took a maximum of two weeks.

1.8.4.2.5. Data analysis

The feedback which was collected from the panellists was analysed to identify the scores, comments and suggestions made. The responses were downloaded into an Excel spreadsheet where analysis to establish their percentage agreement was done and the comments provided by the panellists on suggested modifications were captured. The comments and suggestions were used to modify the developed assessment approach. Refinement and validation of the assessment approach followed an iterative process (Kaur & Pluye, 2019). Two rounds of review by the panellists were enough to reach a 70% consensus for all panellists (Charif et al., 2021).

1.8.4.2.6. Rigour for the modified e-Delphi technique

Rigour refers to the extent to which the researcher works to enhance the quality of their study. In the modified e-Delphi technique, the use of non-face-to-face meetings eliminated group bias in decision-making. An increase in the number of expert participants in the modified e-Delphi technique led to an increase in the reliability of the results. There were more confirmative judgments because of the expert opinions of the panellists (Heale & Twycross, 2015; Hasson & Keeney, 2011). In this study, the panellists for the modified e-Delphi technique were not known to each other since code names were used. Twenty expert panellists were selected for the modified e-Delphi technique to increase the reliability of the results. However, only eight participated.

1.9. Ethical considerations

In this study, the broad ethical principles and key ethical norms and standards as outlined by the National Health Research and Ethics Committee (Department of Health Republic of South Africa, 2015) were followed. The ethical principles that were followed in this phase are outlined in the following section.

1.9.1. Relevance and value

Research should be appropriate and satisfy the needs of a nation, according to the principles outlined by the Department of Health Republic of South Africa (2015). The results of the study will be beneficial to the local and regional community as they are expected to provide valuable insight into assessment practices within the context of CBNE. The assessment approach developed in this study will be a guide for the development and administration of assessments, thereby improving the measurement of competence for nursing students.

1.9.2. Scientific integrity

Scientific integrity entails the use of a sound study design and methodology to maintain scientific integrity, in order to guarantee the relevance and value of the data to be collected as well as that of the research results (Department of Health Republic of South Africa, 2015). The study utilised a mapping review, semi-structured interviews, and the modified e-Delphi technique underpinned by the DBR design in the development of the assessment approach. In

addition, the candidate ensured academic integrity by citing the works of other researchers referred to in the study.

1.9.3. Role player engagements

To ensure that research is rigorous and acceptable, researchers must involve key role players at various stages of the research process (Department of Health Republic of South Africa, 2015; Ministry of Health, Lesotho, 2013). To improve the quality and rigour of the research, the candidate enlisted a panel of experts for the modified e-Delphi technique. These experts critiqued and validated an appropriate assessment approach for CBNE in a low-income country. Before engaging with the staff of the NEIs in Phase 2 of the study, the candidate sought gatekeeper approval from all the NEIs. For the semi-structured interviews, two knowledgeable and experienced participants per NEI were selected. The selection process followed clear inclusion criteria to ensure that experienced experts in the field of assessment and CBE were included. The use of these criteria helped to enhance the acceptability of the results of the study.

1.9.4. Favourable risk-benefit ratio

Before conducting any research, it is important to evaluate the risks and benefits involved to ensure that the benefits outweigh any potential risks. As per the guidelines provided by the Department of Health, Republic of South Africa (2015), a risk-benefit ratio assessment should be carried out before commencing with the research. In this particular study, there was minimal to no risk involved, as the methodology did not include any experimental studies. The candidate ensured that all participants received a detailed information sheet outlining the study's aim and objectives before recruitment, as demonstrated in Addenda A and C.

1.9.5. Fair selection of participants

To ensure fairness, it is important to establish clear criteria for the inclusion and exclusion of participants during sampling throughout the different phases of a study (Department of Health Republic of South Africa, 2015). A thorough search strategy was used to identify publications that offered comprehensive and informative literature on assessment approaches, the results of which were then used to develop a suitable assessment approach for use in a low-income country. Additionally, a purposive sampling technique was used to select participants for the

semi-structured interviews, as well as a panel of experts in assessment and CBE, forming a team of experts for the modified e-Delphi technique.

1.9.6. Informed consent

For people to make informed decisions about taking part in a research project, they must receive sufficient information about the research project beforehand. (Department of Health Republic of South Africa, 2015). To ensure that the participants were well-informed about the semi-structured interviews and modified e-Delphi technique, simple and easy-to-understand information leaflets and consent forms (Addendum A and C respectively) were used. The candidate was also available to provide any further explanations if needed. Before the semi-structured interviews, participants were informed that their interviews would be recorded and their consent was requested for that. They were also reminded that they could withdraw from the study at any time during the data collection process, as their participation was entirely voluntary.

1.9.7. Ongoing respect for participants

The data obtained from the participants should be kept safe and confidential during and after the completion of the research process (Department of Health Republic of South Africa, 2015). The confidentiality of a study is maintained by removing any personal identifiers from the collected data and replacing them with codes. In this research, the participants' identifiers from the semi-structured interviews and the modified e-Delphi technique were replaced with codes to protect their identities. The collected data were only accessible to the candidate and the two supervisors involved in the research project.

1.10. Researcher competence and expertise

To conduct research effectively, researchers must possess the necessary expertise and qualifications. According to the Department of Health of the Republic of South Africa (2015), individuals must have the appropriate skills and knowledge to conduct research. In this particular study, the candidate holds a Master's degree in Nursing while the two supervisors have PhD qualifications and extensive experience in the field.

1.11. Significance of the study

The candidate created an assessment approach for CBNE in a low-income country. This approach is meant to guide the adoption and implementation of assessment in CBNE in a low-income country. The expected outcome of this approach is to improve the assessment of the attainment of competence by students in CBNE and also to contribute to the knowledge base in this regard.

1.12. Layout of the study

This thesis is presented in five chapters as follows:

Chapter 1: Overview of the study

Chapters 2, 3 and 4 will present the manuscripts on the mapping review; description of the contexts at the four NEIs in Lesotho using semi-structured interviews and development of the assessment approach and its validation through a modified e-Delphi-technique; respectively, as follows:

Chapter 2: Assessment approaches in undergraduate health professions education: Towards the development of feasible assessment approaches for low-resource settings (*Article 1: submitted to BMC Medical Education Journal*)

Chapter 3: Context of competency-based assessment in nursing education in a low-income country (*Article 2: submitted to Assessment and Evaluation in Higher Education Journal*)

Chapter 4: An assessment approach for competency-based nursing education in a low-income country: A consensus study (*Article 3: for submission to Nursing Education in Practice Journal*)

Chapter 5: conclusions, recommendations and limitations of the study.

1.13. SUMMARY

In this chapter, the purpose of the study was discussed, which was to create an evaluation method for competency-based nursing education in a low-income country. The methodology that was used to develop this approach was described. The following chapter will present a mapping review of the various assessment approaches that have been used in health professions education.

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2. Assessment approaches in undergraduate health professions education: A mapping review towards the development of feasible assessment approaches for low-resource settings

*“Everyone has the ability to stand on their own feet and make their mark in the world if given proper education.” — **Nitin Namdeo***

CHAPTER 2

ASSESSMENT APPROACHES IN UNDERGRADUATE HEALTH PROFESSIONS EDUCATION: TOWARDS THE DEVELOPMENT OF FEASIBLE ASSESSMENT APPROACHES FOR LOW-RESOURCE SETTINGS

2.1.INTRODUCTION

Curriculum innovations are usually coupled with changes in assessment approaches. In addition, implementation guidelines for the new assessment approaches are not usually simple to adopt in different contexts. This then calls for the education institutions that wish to adopt the assessment approaches to have strategies to aid implementation. In this manuscript the authors share how the mapping review process contributed to the development of an assessment approach for competency-based nursing education in a low-income country that adopted a new curriculum coupled with the programmatic assessment approach.

The previous chapter presented an overview of the whole study and outlined the contents of each of the five chapters of the thesis. This chapter presents the steps that were taken in the mapping review to explore the various assessment approaches that were used over the years. The results from the mapping review informed the development of a feasible assessment approach to use in competency-based nursing education in a low-income country.

2.2.MANUSCRIPT DETAILS

Title	Assessment approaches in undergraduate health professions education: Towards the development of feasible assessment approaches for low- resource settings
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2.2.3. CONTRIBUTION RECORD

All three authors conceptualized the paper. The candidate was responsible for data collection and analysis, with contributions from the research supervisors. The candidate drafted the manuscript with academic oversight from the research supervisors.

2.2.4. ASSOCIATED ADDENDA

Addendum L: Author guidelines for BMC Education.

2.3. MANUSCRIPT ONE

Abstract

Background: Feasible and effective assessment approaches to measuring competency in health sciences are vital in competency-based education. Educational programmes for health professions in low- and middle-income countries are increasingly adopting competency-based education as a strategy for training health professionals. Importantly, the organisation of assessments and assessment approaches must align with the available resources and still result in the fidelity of implementation. A review of existing assessment approaches, frameworks, models, and methods is essential for the development of feasible and effective assessment approaches in low-resource settings.

Methods: Published literature was sourced from 13 electronic databases. The inclusion criteria were literature published in English between 2000 and 2022 about assessment approaches to measuring competency in health science professions. Specific data relating to the aims of each study, its location, population, research design, assessment approaches (including the outcome of implementing such approaches), frameworks, models, and methods were extracted from the included literature. The data were analysed through a multi-step process that integrated quantitative and qualitative approaches.

Results: Many articles were from the United States and Australia and reported on the development of assessment models. Most of the articles included undergraduate medical or nursing students. A variety of models, theories, and frameworks were identified and included the Ideal model, Predictive Learning Assessment model, Amalgamated Student Assessment in Practice (ASAP) model, Leadership Outcome Assessment (LOA) model, Reporter-Interpreter-Manager-Educator (RIME) framework, the Quarter model, and the model which incorporates four assessment methods which are Triple Jump Test, Essay incorporating critical thinking questions, Multistation Integrated Practical Examination, and Multiple Choice Questions (TEMM) model. Additional models and frameworks that were used include the Entrustable Professional Activities framework, the System of Assessment framework, the Reporter-Interpreter-Manager-Educator (RIME) framework, the Clinical Reasoning framework (which is embedded in the Amalgamated Student Assessment in Practice (ASAP) model), Earl's Model of Learning, an assessment framework based on the Bayer-Fetzer Kalamazoo Consensus Statement, Bloom's taxonomy, the Canadian Medical Education Directions for

Specialists (CanMEDS) Framework, the Accreditation Council for Graduate Medical Education (ACGME) framework, the Dreyfus Developmental Framework, and Miller's Pyramid.

Conclusion: An analysis of the assessment approaches, frameworks, models, and methods applied in health professions education lays the foundation for the development of feasible and effective assessment approaches in low-resource settings that integrate competency-based education.

Trial registration: This study did not involve any clinical intervention. Therefore, trial registration was not required.

Keywords: Assessment; Health professions education; Mapping review; Undergraduate education

Background

Implementing competency-based education in health professions education within low-resource settings presents significant challenges. Competency-based education (CBE) is a model for designing and implementing education that focuses on the desired performance characteristics or outcomes of healthcare professionals (1). The CBE model is set to improve student competence by predefining educational outcomes, that support learning and teaching activities (2,3). The fundamental goal of CBE is to empower students with competencies in communication, collaboration, professionalism, and health advocacy, amongst others, to cultivate unique intellectual, emotional, and physical abilities so that they become successful in their professional lives (4,1). However, the aspirations of CBE are rarely achieved in practice for a range of reasons, among which are poor understanding of what constitutes CBE, unclearly formulated competencies, poor implementation strategies, inadequately prepared educators, and unfeasible assessment methods (1,5).

Implementors of the CBE model must ensure the feasible use of robust assessment methods that result in valid and reliable scores that can be used to provide feedback on learning and make decisions about student progression (6,1). Conventional assessment approaches focus on end-of-course high-stakes examinations of knowledge and may be oblivious to authentic performance (7,8). These assessment approaches are mainly summative, may lack detailed

feedback and may be limited in the ways in which they enable the monitoring of growth in student performance. These approaches are also not aligned with the aspirations of CBE in health professions education (HPE) (7,9). The aspirations of CBE were spelt out by the competency-based medical education collaborators.

The competency-based medical education (CBME) collaborators established a CBME Core Components framework aimed at increasing fidelity in implementing CBME (10,5). There are five core components of the CBME framework: an outcomes competency framework; progressive sequencing of the outcomes; learning experiences that are tailored to the competencies in the CBME; teaching that is tailored to the competencies; and assessment following the programmatic assessment (PA) approach (10,5). Accordingly, PA should be embedded in the design and implementation of a CBE programme.

PA takes a longitudinal and holistic approach to assessment and emphasises the learning function of assessment by using an array of assessment methods to provide feedback and make plausible assessment decisions (Van der Vlueten & Heeneman, 2016; Shrivastava & Shrivastava, Programmatic Assessment of Medical Students: Pros and Cons, 2018; Torre D. , et al., 2021). The PA approach is systematic since it encompasses planning with deliberate choices of assessment methods, scheduling, and feedback strategies (11,14). There are twelve principles that underpin the PA approach, which stand to reiterate that every individual assessment method has limitations and, if used alone to gather information on student performance, compromises will be made to reach pass or fail decisions (14). In PA, information on student competence and progression is purposively and continually collected and analysed (3,11,15). The concept of ‘data point’ applied in the PA approach refers to information on student performance that is collected from a single assessment instance (Shrivastava & Shrivastava, Programmatic Assessment of Medical Students: Pros and Cons, 2018; Sherbino, et al., 2020). Single data points are used in formative assessment to provide constructive feedback, which guides learning (13,16). The progressive accumulation of multiple data points becomes the premise of pass-or-fail decisions reached by a group of assessment experts (3). According to the PA approach, the pass-or-fail decisions should not be reached by individuals, but rather by competence committees (14). Programmatic assessment is instrumental in the implementation of a valid CBE programme since effective assessment is a strong force behind the authenticity of CBE (17).

The implementation of PA, however, is resource-intensive (12, 18). Increased fidelity of PA implementation, therefore, requires a number of structures to be in place. There should be a well-established support structure for educators, a supportive administrative department in the institution, and an established group of experts who will make high-stakes assessment decisions affecting students' progression in the programme. Additional aspects that should be in place include training workshops for educators, mentors, and preceptors in the clinical area, as well as timely and constructive feedback after each assessment and the use of multiple methods of assessment for the collection of data on student performance (41, 12, 18). A large volume of data on student performance can be collected, given the multiple methods of assessment used in PA. Therefore, an information management system needs to be established (18). Since no set number of data collection points are stipulated, data collection should continue until saturation is reached (19). The minimum number of data points deemed adequate for saturation differs according to the institutional context (19).

The success of PA implementation is context-dependent (13). Instances of successful PA implementation are sparse and skewed towards institutions in high-income countries (8,14). Canada, the United Kingdom, the United States of America, the Netherlands, New Zealand, and Australia are reported as having successfully implemented the PA approach in their undergraduate medical programmes (14). One low-resourced country in Africa, Uganda, reports the successful implementation of PA (20). There are various reasons that explain why the low uptake of PA approaches exists in low-resourced contexts, including resource disparities, poor leadership and institutional governance, and the limited adoption of CBE across settings (3). The positive skew towards countries in Europe and North America may be due to the development, implementation, and review of PA led by assessment experts from HPE institutions in those regions (21,3).

There is also an interplay of various factors that influence the fidelity of implementing PA. On the one hand, there are factors such as the political, economic, and social context of the institution, poor organisational culture, poor leadership engagement, poor support structures for educators, which appear to negatively influence implementation (13,21). On the other hand, factors such as robust leadership engagement, financial support, adequate support for educators, adequate human resources, and frequent workshops for educators are reported as quintessential to the successful implementation of this approach (18). The outcome of this interplay of factors positions the implementation of PA as resource intensive and thus

unachievable for institutions that aspire to implement CBE in resource-limited contexts (12). Failure by HPE institutions in resource-limited settings to implement the recommended PA approach for authentic CBE programmes has various implications, which have ripple effects on the fidelity of CBE. The implications include, the adoption of feasible and conventional approaches to assessment, drifting away from the PA approach (which has a negative effect on the implementation of CBE), false positive results of CBE implementation, curriculum drift, and graduates who are not competent or ready for work in the health system (3).

There is thus a need to develop a defensible and feasible assessment approach that can be implemented in CBE programmes, especially in low-resource contexts. The developed assessment approach should aim to maintain a balance between the inherent characteristics of the CBE model and enabling factors in the educational context. This article focuses on a mapping review, which reports on the assessment approaches, frameworks, models, and methods related to the implementation of assessment in undergraduate HPE to inform the development of an assessment approach for institutions implementing CBE models in low-resource contexts.

Methods

The review question for this study was:

What is known about assessment approaches, frameworks, models, and methods in undergraduate health professions education?

Study design

The mapping review study design used for this research was structured to enable the collection of literature specific to the field of assessment approaches. The aim was to develop a better understanding of the different characteristics of the assessment approaches, frameworks, models, and methods used in undergraduate health professions education. In order to inform the development of a more feasible assessment approach for a low-resource setting.

The mapping review followed a stepwise approach comprising five steps including searching and screening the literature, data extraction, and analysis and presentation of results.

Step 1: Searching the literature

Searching the literature involves developing a search strategy that comprises the search string and databases to be searched.

Search string

The search string was determined by integrating keywords and synonyms gleaned from the review question. This was done through Boolean operators and modifiers. The search string was piloted and adapted and this is the final string that was used:

(assess* n2 (model* or framework* or theories or theory) and (educat* or train*) and (“health profession*” or “health science*” or nurs* or medical or clinical or medicine) and (undergraduate* or baccalaur*) and ti assess*.

Databases

The search for literature was carried out in May 2022 and covered the period from January 2000 to June 2022. The start date of the early 2000s was chosen due to an increase in the adoption of the CBE approach at that time, which saw new assessment approaches (17). Ten databases were accessed through the EBSCOhost interface. See Table 1 for a summary of databases accessed and publication records retrieved from each.

Table 1: Databases used and abstracts retrieved

DATABASE	PUBLICATION RECORDS RETRIEVED
MEDLINE	86
Academic Search Ultimate	42
CINAHL with Full Text	38
APA PsycInfo	22
Health Source: Nursing/Academic Edition	22
Africa-Wide Information	5
ERIC	10
CAB Abstracts	1
Communication & Mass Media Complete	1
Sociology Source Ultimate 1	1

Step 2: Screening the literature

The search yielded 228 records, which were reduced to 135 by the automatic deduplication process. A further manual deduplication yielded 121 publication records excluding 14 records. The following inclusion and exclusion criteria were then used to screen the remaining 121 publication records.

Inclusion/exclusion criteria

Inclusion criteria: Studies included were peer-reviewed literature published on assessment approaches, strategies, theories, and methods in undergraduate programmes in health professions education.

Exclusion criteria: Studies were excluded if 1) their literature focused on assessment in organisations; 2) the content was about postgraduate education; 3) the assessment was in primary and secondary schools; or 4) the literature did not focus on HPEs and reviews.

The three authors then screened the 121 records against the inclusion/exclusion criteria based on their titles and abstracts. The authors screened these records independently and were blinded of their screening outcomes until a consensus meeting. Discussions among the authors on the screening outcomes were held, and any discrepancies resolved. A total of ninety (n=90) abstracts did not meet the inclusion criteria and were eliminated.

Full-text articles for the remaining thirty-one (n=31) abstracts were retrieved, read, and screened individually by all three authors. A further seventeen (n=17) articles that did not meet the inclusion criteria were discarded. The remaining fourteen (n=14) full-text articles were included in this study, as shown in Figure 1.

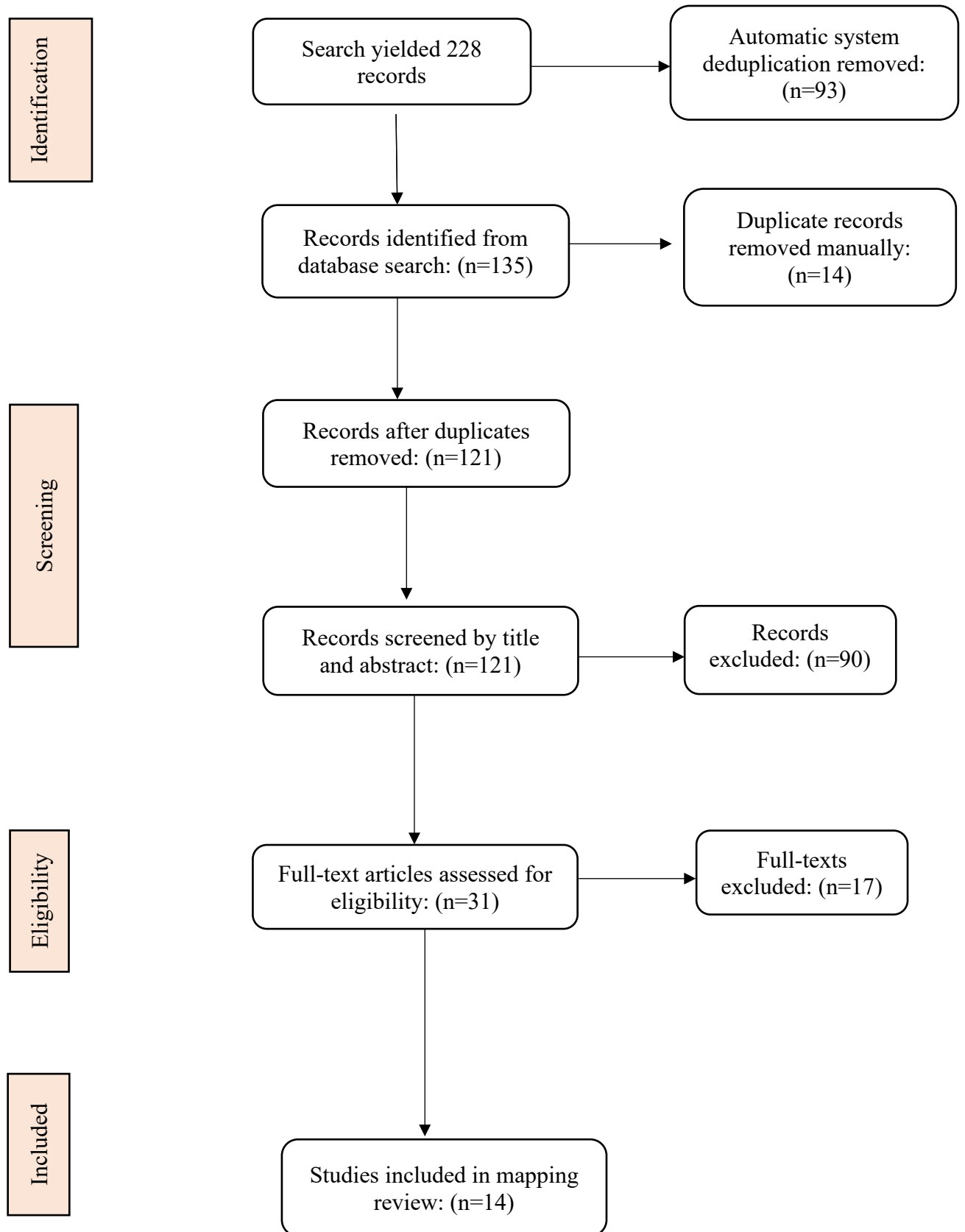


Figure 1: Prisma flow diagram of the mapping review.

Step 3: Data extraction

Data to answer the review question were extracted from the final fourteen full-text articles (n=14). Data extraction was literatim. A Google form was designed for the data extraction. Data elements extracted from the fourteen articles included the year of publication, the country where conducted, aim of the study, population, study design, assessment models, frameworks, approaches, and methods. A summary of the extracted data can be viewed as a supplementary file in this article.

Step 4: Data analysis

Data were analysed both quantitatively and qualitatively using a multi-step process. Frequencies were mainly used to analyse data pertaining to the year of publication and the country where the study was conducted. Thematic analysis for this article focused on the aim of the study, population, design, assessment approaches, frameworks, models, and methods. The themes deduced from the qualitative data analysis were used to inform the development of an assessment approach that can be utilised in institutions implementing CBE models in low-resource contexts.

Step 5: Presentation of results

The aim of the study was, through a mapping review, to report on the assessment approaches, frameworks, models, and methods related to the implementation of assessment in undergraduate HPE to inform the development of an assessment approach for institutions implementing CBE models in low-resource contexts. The results of the mapping review are discussed next by providing information about the contextual backgrounds of the different articles retrieved in the review, the characteristics of the studies, and the factors that are essential for the development of a feasible assessment approach.

Contextual background

The contextual background of the studies refers to the number of publications per 5-year period, the geographical distribution of the research output, and the target population of the publications. The years of publication ranged from the years 2000 to 2022, as illustrated in Figure 2. Figure 2 also illustrates how research output was almost stagnant at 2 articles per each 5-year period over the 20-year period, with spikes to 4 and 5 over the period 2000-2005 and 2011-2015, respectively.

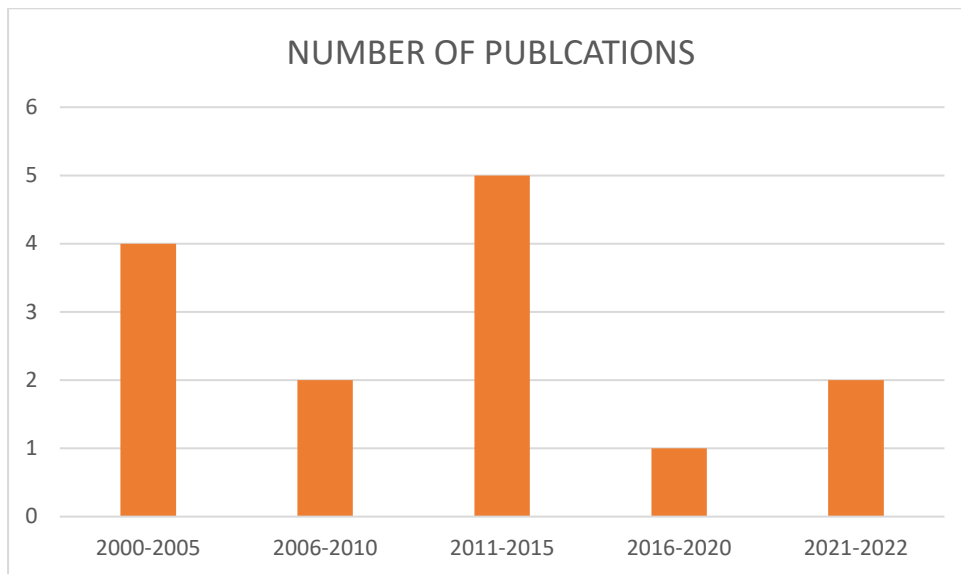


Figure 2: Number of publications per five-year period

Countries where the studies were published and the number of publications over the 2000-2022 period are reflected in Table 2. The results show higher research output in high-income countries than in other countries.

Table 2: Geographical distribution of the articles

Country	Economy classification	Number of articles
Australia	High-income	3
Canada	High-income	1
India	Lower-middle-income	3
Singapore	High-income	1
South Africa	Upper-middle-income	1
United States of America	High-income	5

The target population of most of the articles (n=11) were reported as undergraduate medical students, while the others (n=3) focused on undergraduate nursing students. Regarding the study designs of the 14 articles, only Lafave, Katz, Vaughn, and Alberta (2013) reported a quasi-experimental design and the rest did not mention their study designs.

In terms of the aim of the studies, half of the articles (n=7) reported on the implementation of assessment models that were utilised in their institutions (22,23,24,25,26,27,28). The other articles (n=7) reported on the development of, or proposal to develop assessment models to be implemented (29,30,31,32,33,34,35).

Components essential for the development of a feasible assessment approach

The development of a feasible assessment approach requires background knowledge of the essential components of an assessment approach. Table 3 illustrates these components as assessment approaches, frameworks, models, and methods. The assessment models can be categorised into either purely clinical assessment models, or both theory and clinical assessment models.

Table 3: Assessment models, frameworks, type, approach and methods

Model	Framework	Type of assessment: (Clinical/Theory)	Assessment approach	Methods	Source
Ideal model		Both theory and clinical assessment		Essay examinations; short answer questions (SAQs); multiple choice questions (MCQs); patient clinical examination; problem- based oral questions; objective structured clinical examinations (OSCEs)	Walubo, Burch, Parmar, Raidoo, Cassimjee, Onia & Ofei (2003) (29)
Predictive Learning Assessment model	Earl's model of learning: assessment as, for, and of learning	Clinical assessment		OSCE using the Standardised Orthopedic Assessment Tool (SOAT)	Lafave, Katz, Vaughn & Alberta (2013) (24)
Amalgamated Student Assessment in Practice model	The clinical reasoning framework	Clinical assessment		Scenarios and role plays	Zasadny & Bull (2015) (28)
Leadership Outcome		Clinical assessment		Scenarios	Wissmann, Hauck &

Model	Framework	Type of assessment: (Clinical/Theory)	Assessment approach	Methods	Source
Assessment model					Clawson (2002) (25)
	Reporter-Interpreter- Manager-Educator (RIME) model (is developmental and synthetic as it integrates Bloom's KSA into clinical practice)	Clinical assessment			Pangaro & Cate (2013) (32)
	Bloom's taxonomy (KSA) which focused more on the final objective of education	Both theory and clinical assessment			
	Dreyfus and Dreyfus's developmental framework (novice, advanced beginner, competent, proficient, expert, master)	Clinical assessment			

Model	Framework	Type of assessment: (Clinical/Theory)	Assessment approach	Methods	Source
	Miller's pyramid of competence	Clinical assessment			
	Canadian Medical Education Directions for Specialists (CanMEDS) framework	Clinical assessment			
	The Accreditation Council for Graduate Medical Education (ACGME) framework	Clinical assessment			
	The Observer, Reporter-Interpreter-Manager-Educator (ORIME) model	Clinical assessment			Tham (2013) (33)
Quarter model		Both theory and clinical assessment	Programmatic approach	For theory: short answer questions (SAQs); multiple choice questions (MCQs), extended matching questions and oral examinations should be used.	Singh, Anshu & Modi (2012) (35)

Model	Framework	Type of assessment: (Clinical/Theory)	Assessment approach	Methods	Source
				For practical/clinical assessment: experiments, long cases, short cases, spots, objective structured practical/clinical examinations (OSPE/OSCE), mini-clinical evaluation exercise and objective structured long examination record	
Quarter model		Both theory and clinical assessment	Programmatic approach	For theory: SAQs; MCQs; long answer questions; For clinical assessment: ten-minute long cases; Four 5-minute long OSCE stations; four 5-minute-long viva-voce stations; directly-observed procedural skills	Singh, Anshu & Modi (2012); Gupta, Shah & Singh (2021) (35,31)
TEMM model		Both theory and clinical assessment		For theory: short-answer questions, fill in the blanks, true/false, matching items, and restricted response essays; MCQs.	Abraham, Upadhyaya, Torke

Model	Framework	Type of assessment: (Clinical/Theory)	Assessment approach	Methods	Source
				For the clinical assessment: performance exercises; ten- station objective structured practical examinations	& Ramnarayan (2005) (26)
	System of assessment framework	Both theory and clinical		For theory: MCQs; National Board of Medical Examiners clerkship shelf examinations For clinical: OSCEs	Colbert-Getz & Shea (2020) (34)
	Assessment framework based on the Bayer–Fetzer Kalamazoo Consensus Statement			OSCEs	Rider, Hinrichs & Lown (2006) (23)
	Entrustable Professional Activities framework				Violato, Cullen, Englander, Murray, Hobday, Borman-Shoap & Ersan (2021) (27)

NB: Grey scale sections were not reported.

Table 3 shows that there are various assessment frameworks that are in use. Frameworks that guide assessment can be categorised into analytic, synthetic, and developmental frameworks. Examples of analytic frameworks are Bloom's taxonomy, the CanMEDS Framework, and the ACGME framework. The developmental framework is the Dreyfus Developmental Framework. The synthetic frameworks are the RIME framework and Miller's Pyramid. One assessment approach, the programmatic assessment, was mentioned in the review.

A wide variety of assessment methods are listed in Table 3. These assessment methods include the OSCEs, scenarios, reflective reading logs, portfolios, laboratory reports, online discussion group submissions, essays, reports, projects, MCQs, problem-based oral examinations, structured short and essay questions, case studies and viva-voces. Assessment methods can be classified into theory methods and practical/clinical methods (35). Theory assessment methods include SAQs, MCQs, extended matching questions, and oral examinations. Practical assessment methods include long cases, short cases, OSCEs, mini-clinical evaluation exercises, and objective structured long examination records.

Discussion

The mapping review explored assessment approaches, frameworks, models, and methods in undergraduate HPE over the years 2000 to 2022 as a baseline for the development of an assessment approach. The developed assessment approach could be utilised by institutions in low-resource countries that wish to implement CBE models. Important to note here is that structured assessment processes are essential in CBE curricula. Generally, the mapping review revealed that there is limited discourse around the topic of assessment approaches in HPE. In the past 22 years, there has been minimal research output on this topic, and the research that has been published is generally skewed towards high-income countries.

Indeed, the geographic and economic orientation of the research used for the mapping review showed that the majority of publications were from high-income countries like the United States of America, New Zealand, Australia, Canada and Singapore. According to Govaerts et al. (3) there is marked success in the implementation of CBE in high-income countries (HICs), hence the higher publication output. Lema, Kraemer-Mbula and Rakas (36) also concluded that health education professionals in high-income countries can afford to implement various assessment models and publish their outcomes, unlike their counterparts in low-resource countries. Lema, Kraemer-Mbula and Rakas (36) reiterate that research on innovation is generally distributed along income lines and that even though

research output on innovation in low- to middle-income countries (LMICs) has grown substantially in the past two decades, it is still skewed towards upper-middle-income countries like China.

Other reasons that explain why the majority of the research on assessment approaches in HPEs is from high-income countries include funding deficits in low- and middle-income countries (LMICs), which hinder research output (37,38). Inadequate funds lead to poor information technology, unstable power supply, and the inaccessibility of libraries and journals (37). There appears to be insufficient human capacity in research as well as few research mentors and role models, and a lack of a research culture, which can have a negative impact on research output in HPE institutions in low-income countries. Thus, although there is a significant amount of innovation taking place in HPE institutions in LMICs, there is still limited research output. There also seems to be insufficient networking among research communities in LMICs, meaning that support among researchers is lacking. Limited use of research evidence could, in turn, demotivate researchers to engage in further research. Unlike in HICs, students in LMICs are often introduced to research late into their academic journeys. In LMIC contexts, research is mostly introduced towards the end of a student's undergraduate degree. Additionally, limited career options in research mean that potential researchers may only implement research projects as partial fulfilment of their degrees and not as a career pathway trajectory. A further issue is the poor reception of research papers in reputable journals, which may also dampen the researcher's spirit (38).

Research theory, however, does provide some insight into the ways in which research in LMICs can be better enabled. Factors that can enable research include: allowing for curricula innovation and high research output, keeping class sizes relatively small, the presence of specialised assessment experts who offer support to faculty, a collegial environment, a centralised funding system, outstanding information technology resources, state-of-the-art clinical simulation centres, a shared educational vision with the leadership of the institution, stakeholder involvement, input from other departments at the university that may have already successfully implemented CBE, a centralised governance structure, and educational consultants who support the programme (37).

This mapping review also revealed that there is some stagnation in the field of assessment in CBE. This stagnation could be linked to the curriculum innovation taking place within many HPE institutions, which means that they are yet to establish feasible assessment approaches in their contexts. To illustrate this point, half of the papers (n=7) from the review reported on the development of, or proposals to develop assessment models, which are thus yet to be implemented

(29,30,31,32,33,34,35). HPE institutions still seem to be trying to find their footing in terms of assessment in CBE.

The development of a feasible assessment approach should be supported by good assessment frameworks. The assessment approaches used for the assessment of competence in CBE can be structured around Miller's competency pyramid as shown in Figure 3 below (39,40). Miller's Pyramid presents a framework that can be used to assess levels of clinical competence from cognitive levels of knowledge (knowing and knowing how), application of knowledge (showing), practical application of the knowledge in a practice setting (doing) (40). Miller's pyramid has become the beacon of assessment frameworks in CBE as it allows assessment of all facets of competence, which include knowledge, skills, and attitude. Miller's pyramid divides the development of clinical competence into four hierarchical processes with knowledge at the lowest level, tested by written examinations and MCQs. The second level, application of the knowledge, is assessed by essays, clinical problem-solving exercises, and extended MCQs. The third level, clinical skills competency, is assessed by OSCEs. The final level, clinical performance, is assessed by direct observation in real clinical settings (40). The use of frameworks in collaboration with assessment models will guide the development of an appropriate assessment.

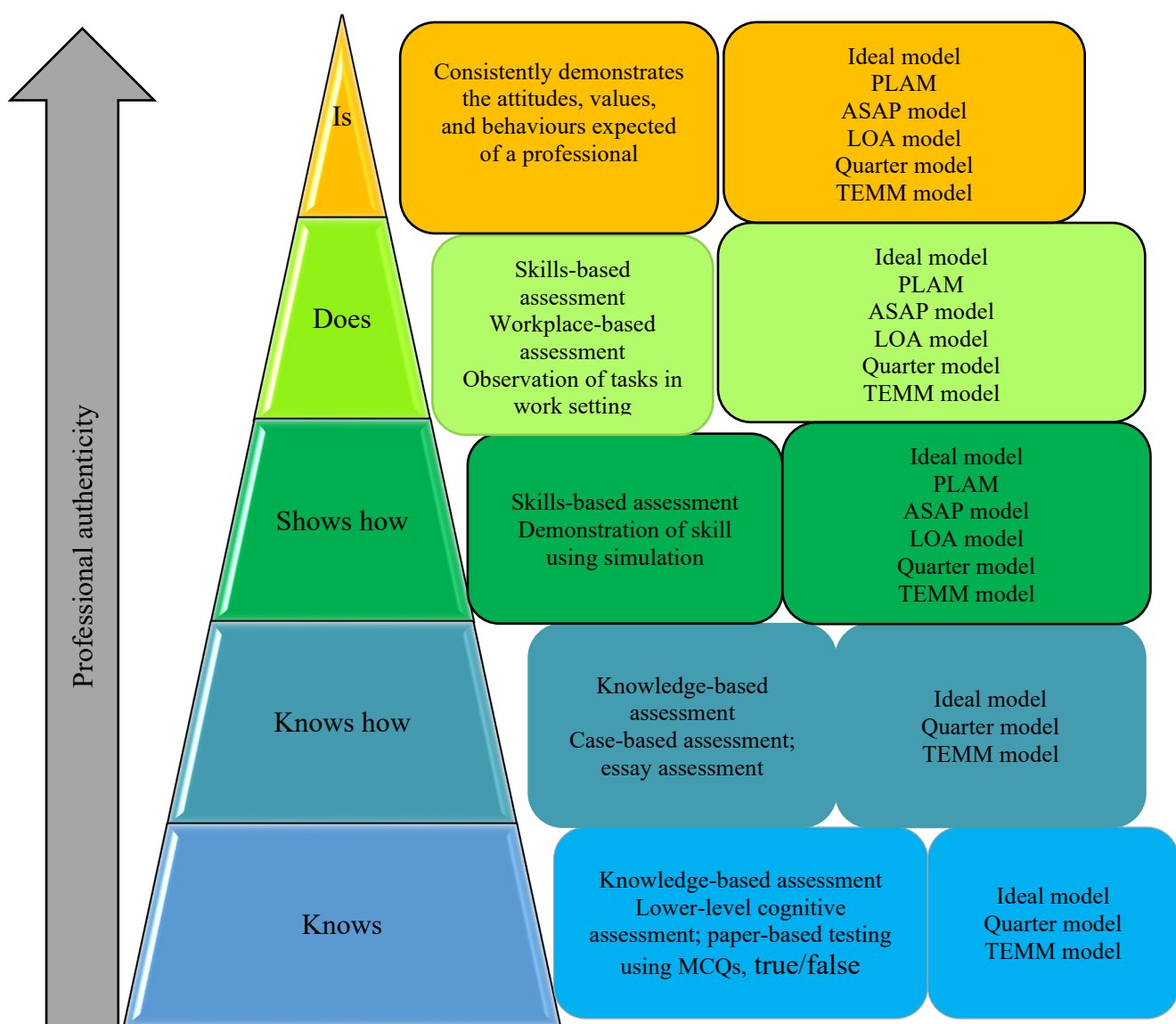


Figure 3: Adaptation of Miller's Pyramid of Clinical Competence (1990)

Assessment models and frameworks in CBE are centred around students' attainment of competency. Miller's framework guides the assessment of competence in CBE (39) and how a student progresses from novice to expert in their academic growth, as illustrated in Figure 3 above.

Assessment approaches are associated with the use of assessment methods in collecting data during the academic journey of the student. The choice of assessment method depends on the educational justification for using the method at a particular time (41). Some authors believe that oral assessment methods, like presentations and viva voces, can be used to allow students to better express themselves

and to give the assessor an opportunity to probe further in gaining a clearer picture of the student's understanding of the content (Theobold, 2021). In terms of written assessments, however, a comparison between SAQs and MCQs may give a false impression of students' performance. SAQs give students a chance to express their cognitive capabilities and errors (43). However, the disadvantage of SAQs is that students focus on practising examination techniques rather than on having a full understanding of the principles of the subject matter. Hence, SAQs do not prepare students for the clinical tasks they will have to complete with patients, which require them to apply their medical knowledge (43). Therefore, the necessity of a mix of assessment methods to ensure a comprehensive assessment of the student.

One assessment method that has gained popularity in medical and healthcare education since its introduction by Harden in 1975 is the OSCE (44). The success of OSCE is based on the specific measurements that OSCE has, which are validity, reliability, feasibility, and credibility. The inherent strength of OSCE is its objectivity because examiner and patient variations are eliminated (45). However, OSCEs require much planning and can be resource intensive in terms of budget for training examiners, remunerating simulated patients, and setting up multiple stations in contexts with large student numbers (45,46).

The uptake and implementation of CBE in HPE institutions have not been flawless. This has negatively impacted the assessment strategies utilised (47). The first flaw is often disagreement in what the terms 'competence' and 'competency' mean. This disagreement has led some nations to contextualise their understanding of the terms, which has, in turn, lead to varied implementation strategies of CBE and its assessment strategies. Some countries have instituted CBE, but later stepped back from some or all of their curriculum reform strategies. For example, Sweden partly unraveled its earlier CBE approach in 2011. England went on to replace its competency-based curriculum in 2014 (48), and Japan, Poland (49) and the Flemish community of Belgium (50) are said to have shifted back towards more discipline-focused curricula. All the evidence seems to paint a picture that CBE, and its associated assessment strategies, are not easy to implement. Therefore, HPE institutions that wish to adopt CBE might have to develop an assessment approach that is feasible in their context, yet fulfils the mandate of assessment in CBE.

There is also a discrepancy in the fidelity of implementation due to political influences as some countries rhetorically announce that they have joined the group of nations that have adopted CBE without adopting the same curriculum reform as those countries (47). These countries have developed hybrids of the CBE curriculum. Most countries that have been unsuccessful in rolling out a CBE

curriculum have altered the ideas of CBE to fit into their national political, economic, or cultural contexts. Deng and Peng (51) have shown how China's competency framework is adapted to its Confucian and socialist context. The United States have combined their competency framework with pragmatism. The Swedish reform led to the meshing of content-based reforms with competency-based reforms. This hybridity in approaches to curricula supports the overarching argument of this study, which is to stress the need to develop an assessment approach that is feasible for implementation in low-resource settings.

Conclusion

As HPE institutions adopt CBE, maintenance of the fidelity of the CBE is essential. To keep the fidelity of CBE implementation high, the PA approach has to be utilised in the assessment of and for learning. However, the reviewed literature has revealed that PA is a resource-intensive approach. As a result, institutions that cannot afford the implementation of PA will likely adopt CBE, but resort to affordable, traditional assessment methods. This mapping review set out to reveal the importance of establishing what factors are essential in developing an alternative and feasible assessment approach that fulfils the requirements of assessment in CBE to be used in low-resource settings. Based on the results of this mapping review, future research should seek to develop a more feasible assessment approach that can be used in CBE in those contexts where the implementation of PA is costly.

Limitations

Time was one of the limiting factors in this research since it was part of a study qualification, which had to be completed within a specific time frame. Language limited the number of articles that could be accessed in the review since English-only articles were retrieved.

Recommendations

Educators planning for the development of an assessment approach should consider a mapping review that includes other non-English articles to broaden the results. Assessment models, frameworks, and methods are essential in structuring the development of a new assessment approach. Therefore, educators should be guided by considering the selection of a model, framework, and assessment methods that are feasible in their context.

List of abbreviations

CBE: Competency-based education

HPE: Health profession education

MCQ: Multiple choice questions

RIME: Reporter-to-interpreter, to-manager/educator

TEMM: a model consisting of 4 assessment methods: the Triple Jump Test, essay incorporating critical thinking questions, Multi-station Integrated Practical Examination, and multiple-choice questions

OSCE: Objective structured clinical examinations

SAQ: Short answer questions

LMICs: Low- and middle-income countries

HICs: High-income countries

Declarations

Ethics approval and consent to participate

Ethics approval for this study was obtained from the Health Sciences Research Ethics Committee at the University of the Free State (UFS-HSD2022/0510)

Consent for publication

The authors have given their consent for the publication of the article.

Availability of data and materials

The datasets generated and/or analysed during the current study have been included in the results section and are publicly available. A raw data file has been added in the supplementary material and is publicly accessible.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

All authors conceptualized the review, the interpretation of the study findings and the writing of the article.

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3 CONTEXT OF COMPETENCY-BASED ASSESSMENT IN NURSING EDUCATION IN A LOW-INCOME COUNTRY

“Competence is a great creator of confidence” Mary Jo Putney (n.d.)

CHAPTER 3

CONTEXT OF COMPETENCY-BASED ASSESSMENT IN NURSING EDUCATION IN A LOW-INCOME COUNTRY

3.1. INTRODUCTION

Feasible and sustainable curriculum innovation requires a supportive context. Therefore, institutions that intend to implement new assessment methods must have a comprehensive understanding of their contexts. A good comprehension of the context enables context-oriented strategies for easy implementation. This study aimed to explore the contexts of assessment at four nursing education institutions in a low-income country that implemented competency-based education and programmatic assessment.

The previous chapter, reported on the mapping review that was carried out to explore the various assessment approaches that were used over the years. The results from the mapping review informed the development of a feasible assessment approach to use in competency-based nursing education in a low-income country. This chapter presents the processes that were followed in exploring the contexts at the four nursing institutions that implemented competency-based education and programmatic assessment.

3.2. MANUSCRIPT DETAILS

Title	Context of competency-based assessment in nursing education in a low-income country
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Journal details	An open access journal that publishes double-blinded peer-reviewed research articles
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3.2.1. JOURNAL INFORMATION

The Assessment and Evaluation in Higher Education Journal publishes papers and reports on all aspects of assessment and evaluation within higher education. The purpose of the journal is to advance the understanding of assessment and evaluation practices and processes. These contributions are particularly valuable for enhancing student learning, as well as supporting course, staff, and institutional development.

3.2.2. SUBMISSION RECORD

The manuscript was submitted on the 13th of November 2023 to the journal.

3.2.3. CONTRIBUTION RECORD

All three authors conceptualized the paper. The candidate was responsible for data collection and analysis, with contributions from the research supervisors. The candidate drafted the manuscript with academic oversight from the research supervisors.

3.2.4. ASSOCIATED ADDENDA

Addendum M: Author guidelines for Assessment and Evaluation in Higher Education

3.3. MANUSCRIPT TWO

Abstract:

Organisational considerations are essential when proposing the implementation of an educational innovation like programmatic assessment. Currently, most recommendations by regulatory bodies to adopt curriculum reforms do not take into consideration the characteristics of low-income countries. This paper explores the contexts of four nursing education institutions in a low-income country that recently adopted the programmatic assessment approach in their programmes. The study was underpinned by the environment phase of the Design Science Research framework and used semi-structured small group interviews to collect data. Deductive thematic analysis was performed to map the data to three themes: the people; the organisation in terms of culture, structure and strategies; and the state of technology. The results revealed that organisational contexts in terms of the people, the organisation culture, structure and strategies and the state of its technology are essential in the implementation of programmatic assessment. Successful implementation requires a shift in organisational paradigms in terms of assessment cultures while affording maximal support and training to enhance the capabilities of students and educators experiencing the change. Collaboration with other institutions at advanced stages of programmatic assessment implementation is essential. Finally, continuous professional development for all stakeholders is essential for sustainable implementation of the programmatic assessment approach.

Keywords: Context; programmatic assessment; low-income country

Introduction

Implementing curricular reforms within health professions education contexts often takes place in complex organisational processes that may threaten true transformation and the sustainability of such change (Torre, Rice, Ryan, Bok, Dawson, Bierer, Wilkinson, Tait, Laughlin, Veerapen, Heeneman, Freeman & Van der Vleuten, 2021). Politics, the economic and social conditions, leadership engagement, and characteristics of individuals which include stakeholder acceptance, ability and willingness to embrace change are part of such an educational organisational culture (Akala, 2021; Torre, *et al.*, 2021). True educational transformation must be nested in a progressively functional organisational culture. Health professions education institutions in high-income countries that adopt curriculum reforms often report the implementation of innovative and transformative assessment approaches (Govaerts, Van der Vleuten & Schut, 2022). Transformative and sustainable change in a particular context should be focused on influencing the “deep structures” within the organisation that include communications patterns, motivational forces among individuals and groups, competing values and priorities, which shape and are shaped by the organisational culture (Schut, Magio, Heeneman, Van Tartwijk & Van der Vleuten, 2021; Torre, Schuwirth, Van der Vleuten & Heeneman, 2022; Govaerts *et al.*, 2022).

The World Health Organization (2022) recommends that health professions education programmes adopt the competency-based paradigm to guide the education and assessment of future healthcare workers. Competency-based education (CBE) is centred around the notion that predetermined outcomes or competencies guide the teaching, learning and assessment in the education of healthcare workers who are life-long learners that execute their work with proficiency in all competency domains (Govaerts *et al.*, 2022). In CBE, through their active seeking behaviour for feedback, students are assumed to learn to reflect and shape their learning through the identification of learning

opportunities for further development (Govaerts *et al.*, 2022). Conversely, CBE has been criticised for being impractical, costly, narrowly utilitarian and contributing to the fragmentation of subjects (Akala, 2021; Naranjo, 2022). These critics ultimately dilute the hegemony of CBE as an educational approach in health professions. Programmatic assessment is an example of the challenging requirements associated with implementing CBE in health professions education (Schut, *et al.*, 2021).

Programmatic assessment (PA) is an approach where information about the student's linear acquisition of competence and professional growth is persistently collected, using single assessment activities known as 'data points', analysed, and if required, supplemented with additional assessment information. The ultimate aim is to inform the high-stakes decision-making process at the end of the training phase (Bok, de Jong, O'Neill, Maxey & Hecker, 2018; Shrivastava & Shrivastava, 2018; Schut, *et al.*, 2021; Ryan, O'Mara & Tweed, 2023). The use of multiple low-stakes single data points in gathering information on students' progressive performance is essential as competency develops across courses and over time. It allows for the elimination of weaknesses in single assessment methods (Bok *et al.*, 2018; Schut, *et al.*, 2021). Multiple assessment methods have the strength to inform the student and the educator on areas that require remediation (Shrivastava & Shrivastava, 2018; Van der Vleuten, Lindemann & Schmidt, 2018; Balakrishnan, Van Loon & Joyce, 2022; Baartman, Van Schilt-Mol & Van der Vleuten, 2022).

Programmatic assessment has been implemented mostly in high-income countries namely the Netherlands, the United States of America, Canada, Australia, and New Zealand (Van der Vleuten *et al.*, 2018; Cheptoo, 2019). In contrast, there is limited empirical evidence of its implementation within health professions education programmes in low-income countries (Roberts, Khanna, Bleasel, Lane, Burgess, Charles, Howard, O'Mara, Haq & Rutzou, 2022). Without empirical evidence of the success of PA, educators, especially in low-income countries who are facing pressure to implement CBE, cannot make informed decisions regarding PA in their contexts where traditional assessment

approaches are prevalent and successful (Roberts *et al.*, 2022; Rubab & Imran, 2023). In as much as there are reports of the positive impact of PA on the quality and outcomes of learning in some institutions, Torre and colleagues (2021) claim that these outcomes are not universal even within high-income countries.

Successful PA implementation requires a receptive context which entails a paradigm shift in the organisational culture, norms and beliefs (Torre *et al.*, 2021; Schut *et al.*, 2021; Torre *et al.*, 2022; Govaerts *et al.*, 2022). Successful transformation of assessment approaches from traditional methods to a context-specific and culturally bound PA paradigm requires buy-in from all key stakeholders in the assessment process (Torre *et al.*, 2021; Torre *et al.*, 2022; Govaerts *et al.*, 2022). In addition, both institutional regulations and national legislation or accreditation frameworks may facilitate or hinder the implementation of PA (Torre *et al.*, 2021; Govaerts *et al.*, 2022). Noteworthy is that implementation of PA requires some considerations, namely the necessity of assessment blueprints that clarify the contribution of each assessment; specifications of how and when data points are to be collected; availability of a group of competent experts for decision-making processes; staff support; built-in quality improvement and evaluation processes; and the establishment of a faculty development programme which focuses on assessment literacy and feedback giving (Van der Vleuten *et al.*, 2018; Wilkinson and Tweed, 2018; Torre *et al.*, 2021). However, the scarcity of knowledge of PA implementation and adaptation strategies to overcome the barriers associated with PA implementation globally (Schut *et al.*, 2021) within low-income countries remains a challenge - even after being promulgated and endorsed as an integral part of CBE (Van Melle, Frank, Holmboe, Dagnone, Stockley & Sherbino, 2019; WHO, 2022).

An organisation's culture is critical. It is carried by and is embedded in its people through their values, convictions, and beliefs (King, Schuwirth & Jordaan, 2022). The culture of an organisation can have implications for educational change. Therefore, the successful implementation of PA may not

necessarily be about changing the assessment methods but rather about transforming the assessment culture and underlying assumptions, beliefs, norms goals, perceptions and roles in the organisation (Govaerts *et al.*, 2022). A report from a Canadian medical school by Tait and Kulasegaram (2022) reiterates that successful change of approaches to PA required support from the central governance, strong leadership, and availability of resources that support the new assessment processes and procedures. The development of policies that are in alignment with PA is critical and makes implementation easier and more feasible (King *et al.*, 2022). Supportive leadership with a distinct vision of the importance of PA in the institution is also essential (Torre *et al.*, 2021; Lomis, Mejicano, Caversagie, Monrad, Pusic, & Hauer, 2021; Torre *et al.*, 2022). The leadership should ensure the availability of clear articulation strategies and rationale for change, staff training, development of supportive policy and procedures for PA, and appropriate data management systems for implementation to be successful (Ryan *et al.*, 2023). In addition, PA implementation requires organisations to operate in an environment that allows for adaptive planning, encourages awareness of contextual changes and can manage the unexpected (Torre *et al.*, 2022). Collaborations with other institutions are essential in establishing change strategies for PA as reported in institutions in Australia and New Zealand (Ryan *et al.*, 2023). The collaborations can extend from the sharing and development of assessment items to system governance made possible by advancements in technology (Ryan *et al.*, 2023). The enablers and barriers to the implementation of PA are not reported by health professions education institutions and organisations from low-income countries.

A low-income African country implemented competency-based nursing education for their pre-registration nursing programme (Nyoni and Botma, 2019; Mukurunge, Badlangana & Nyoni, 2020; Moabi and Mtshali, 2022). PA underpinned the assessment approaches in four nursing education institutions that implemented CBE (Shawa, Masava, Mutimbe, Nyoni, Mokhele, Mukurunge & Nyoni, 2023). Evidence suggests challenges related to implementing PA in these institutions which compromises the ideals of competence-based nursing education and the quality of nursing graduates

(Shawa *et al.*, 2023; Nyoni & Botma, 2019). In this paper, we investigated the context of the implementation of PA four purposefully selected nursing education institutions. Insights into the context of PA implementation in a low-income country may be useful in developing a contextually relevant assessment approach in these settings.

Methods

This paper reports on the context of assessment at four nursing education institutions (NEIs) that implemented PA as part of CBE in a low-income country. To describe the contexts in the NEIs, the study was embedded within the “environment” phase of the Design Science Research theoretical framework as shown in Figure 1. The Design Science Research (DSR) methodology is used to develop knowledge that professionals of a discipline in question can use to design solutions for problems in their field (Weber, 2012; Venable, Pries-Heje & Baskerville, 2012). The environment phase in the DSR framework seeks to describe the organisation in terms of its people; the organisational culture, structure and strategies; and the state of technology. Data to describe the contexts at each of the four NEIs were collected using semi-structured interviews. The development of the interview guide used in the semi-structured interviews was guided by the contents of the environment phase in the DSR framework. One semi-structured interview was conducted at each of the four NEIs with two purposively selected nurse educators who had a direct role in the implementation of PA.

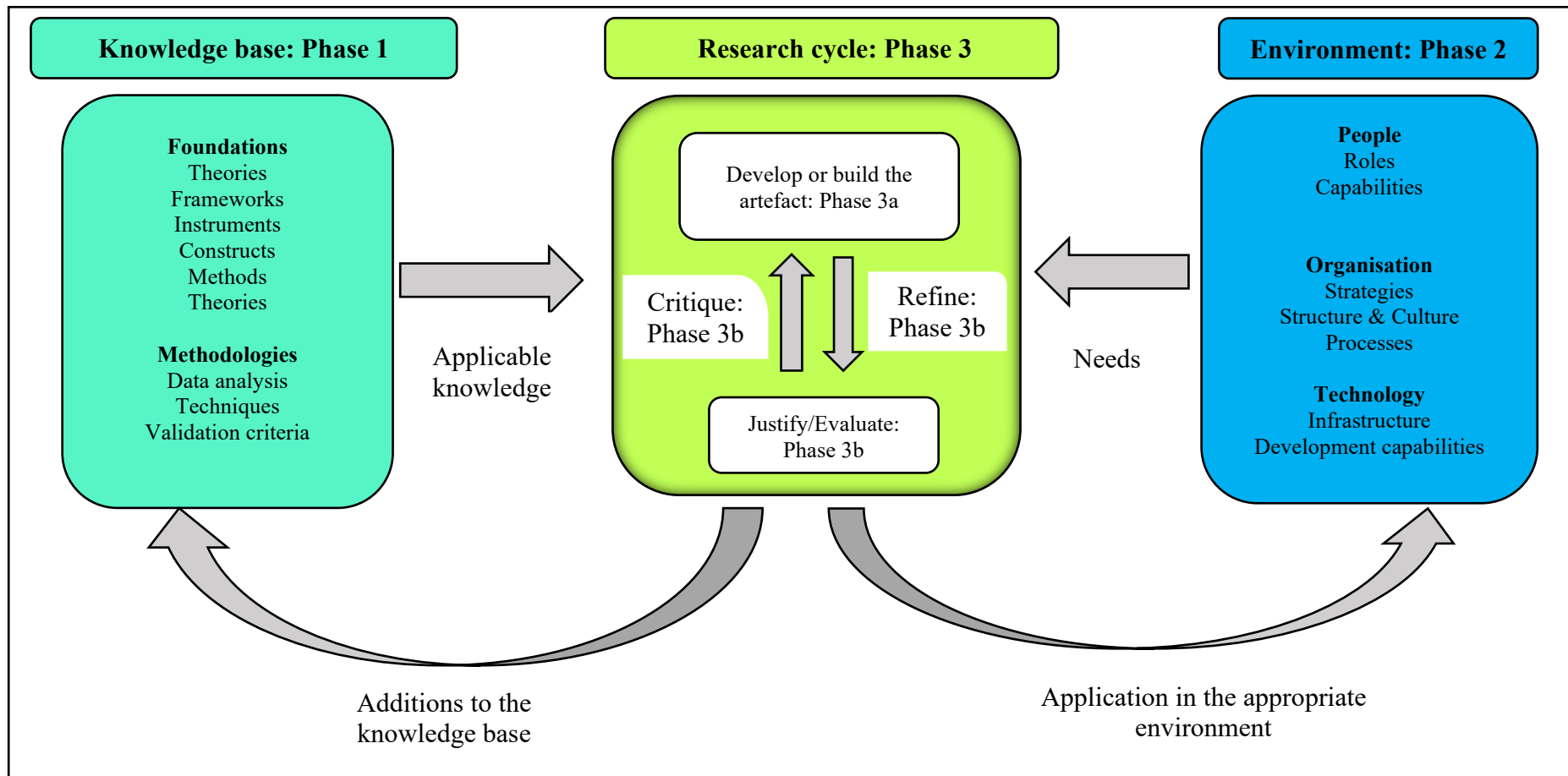


Figure 1.3: Design Science Research method for the development of the assessment approach, adapted from Weber (2012)

Probing questions were asked related to the people, organisation and culture as guided by the environmental phase of DSR theoretical framework (Weber, 2012: online; Venable, Pries-Heje & Baskerville, 2012). The people domain refers to their roles and capabilities; the organisation domain, its strategies, structure and culture and its strategies; the technology, the infrastructure and its development capabilities. All participants signed informed consent and permission was granted for audio recordings which were on average 40 minutes of discussion regarding the context of implementing PA in their institution. The recordings were then transcribed verbatim before deductive thematic analysis by the researcher with two independent co-coders following the approach of Braun and Clarke (2006). The predefined themes were the people, the organisation and the technology

Findings

The contexts of implementing PA in the four NEIs in a low-income country are presented according to the people, organisation and culture themes. Codes are assigned to the participants according to their institution, for example, P1N1, for Participant 1 from School of Nursing 1. The coding process is illustrated in Addendum R.

People: roles and capabilities

The data revealed that in the four NEIs, the roles of the educators include developing assessments and marking the written assessments including practical examinations such as the OSCEs and Long Cases. In addition, the educators were expected to compile reports which reflect an analysis of the performance of students in their summative assessments.

“... the role of the educator in as much as they are facilitators in the process of the teaching and learning. They also are involved in formulating the assessment items, marking of the assessments and also doing the item analysis and writing reports...” (P1N2)

The participants are also involved in the moderation of assessments before they are administered to the students. Accordingly, the moderation process was built in two phases which focused on reflecting the validity and feasibility of assessment tasks and re-marking the assessments to ensure consistency in marking. These moderation practices appeared to be performed across institutions specifically for high-stakes summative assessments, involving educators from external institutions.

“...we have internal and external moderation. This is done by peers within an institution and an educator who has at least three years of teaching in the institution would be given a test after I have set it to see whether the test goes. It is in line with the outcomes as reflected in the module...” (P1N4)

Students within the nursing programmes were also reported by P2N3 to have a role in the implementation of assessment approaches. In all the NEIs, student representatives take part in deliberations made in institutional assessment committees as a recommendation from the national regulatory body. The nature of involvement of the students and how their input is valued was not reflected in the interviews.

Regarding the capabilities of the educators, the participants reported varied capacities in engaging with assessments in CBE. In this setting, nurse educators were and are expected to have a basic postgraduate diploma in nursing education where the basics of assessment and moderation are learnt. Therefore, experience as an educator was perceived to be sufficient to implement the PA approaches. However, as a quality improvement approach, one institution appeared to challenge this notion of inherent capabilities of nurse educators by creating a faculty development programme that was coordinated by doctorally qualified nurse educators with extensive experience in competency-based education.

“...Capitation usually begins at the beginning of the semester, where we capacitate staff on implementation of assessment in each module and ... towards the final examinations. Initially, we had some external capacitation from the institution that we are affiliated to but now we have been

using the local expertise because they are knowledgeable about the context and the challenges in the context...” (P1N1)

Clinical assessment in all four NEIs includes objective structured clinical examinations (OSCEs), directly observed procedures, compilation of portfolios and oral presentations. Assessment of competence in clinical skills is cumulative over the years of training, starting with the simplest to the most complex in the final year of study.

“...The assessments are linked because we are building on the basics like for example the first years when they go for clinical placement in the wards they do the basic nursing activities of daily living, so they will be doing the bed baths of patients, feeding patients, and the making of the beds observations like temperature and Bp are done. When it comes to the assessment, we are going to assess them on that. When they go to 2nd year, we are not going to assess them on how they take the temperature but we know we expect them to be able to take the temperature so that will not be the focus of our assessment...” (P2N3)

To make OSCEs authentic and objective there is a need to utilise standardised patients for all students in OSCE stations where a patient is required. Therefore, the people who act as standardised patients need orientation and training for the role that they will have to play. The role of training and orientation is assumed by the educators who are responsible for clinical assessments, liaising with all relevant stakeholders in assessment and the training of standardised patients.

“...They are also trained on their role in training standardised patients in the OSCEs...” (P2N2).

Organisation: strategies, structure and culture

The educators were reflected to be critical in the implementation of PA in the NEIs meaning that these institutions needed to have strategies to support nurse educators in implementing PA. Training workshops were reported as essential in keeping educators up-to-date with assessment practices in

PA. One of the four NEIs had scheduled training workshops dedicated to assessment throughout the year as a strategy for faculty capacity development. The training workshops include setting up assessments, assessment methods, assessing theory and practice and report writing within a PA approach. The other institutions did not have a strategy focused on equipping their educators on assessment, nor any additional support during implementation.

“...Every semester before assessment time, all the educators are exposed to or are subjected to capacity building workshops and orientation or reorientation for those that are already in the system. No educator goes into the setting of assessment without the capacitation workshops on how to do assessment...” (PIN1)

“...The major challenge is that one which you have rightfully indicated that there are no follow-ups and supervision. People who train us, they will train us and then they will leave, whether we are doing it right or we are not doing it right. There's no follow-up, that is the major challenge...” (PIN3).

The oversight of assessment practices amongst the institutions included in this study varied. Oversight in this context was perceived as influencing and approving policies related to assessment, engaging with assessment outcomes and providing strategic directions related to student assessment. However, not all structures in the institutions provided sufficient assessment oversight and educators within the country did not have sufficient experience and expertise for their overall oversight. While three of the included institutions were reportedly part of a local faith-based consortium that was responsible for the logistical arrangements, basic coordination and linking the institutions with the local university, one of the institutions had a specific academic senate which was reported as an independent body consisting of international experts in health professions education and assessment.

“...The Academic Senate gives oversight and also advice to say in terms of your assessment here how about you change it for the next academic year... the Senate is made up of various people, and then

some people have qualifications in Health Sciences education assessments. Two people give us oversight in terms of assessment of theoretical outcomes, and then also the practical outcome. Some two experts were recruited because of their expertise in practical assessments...” (P2N1)

As a strategy to enhance quality assurance within the education programmes and the implementation of CBE, all the NEIs in this study had established quality assurance officers to ensure adherence to assessment standards and the maintenance of quality in the institutions. These quality assurance officials had clear job descriptions which varied per institution but had not been trained or sufficiently qualified in the field of quality assurance.

“...then the report would go to the quality assurance officer, who will also ensure that all recommendations have been captured and they've been incorporated in my exam ... that is internal moderation...” (P1N3)

All NEIs have developed an assessment policy that is aligned to the competency-based programmes including blueprints developed according to Bloom's taxonomy and Miller's pyramid to guide the implementation of assessment. An academic committee was reported to oversee internal issues related to assessment at one institution - which was not a universal phenomenon across all four institutions. As much as policies related to assessment were reported to be in place, their implementation was impeded by the shortage of nurse educators and other resources in their implementation.

“...The Academic committee is there to oversee the issues of assessment internally, and it's the one that appoints internal moderators for each module, and also issues of mentoring of junior assessors before they are left to start assessing on their own...” (P2N1)

“...The 4 clinical supervisors are still not enough according to the quota set by the regulatory body for the number of students per clinical supervisor...” (P2N2)

Institutional research on assessment is lacking. A few nurse educators were reported to be actively involved in research with associated research outputs and engagement with and contributing to evidence.

“...We also engage in academic conferences. Every year we participate in that and we gather a lot of evidence about the teaching and learning practices and also in terms of assessment as well as keeping abreast of what is prevailing...” (P2N1)

Technology: infrastructure and its development capabilities

The third theme is aligned with the infrastructure and potential for development in the included NEIs. The infrastructure which includes available resources, finances and technology are quintessential in defining a context for implementation assessments within CBE. All the included NEIs are funded centrally by the government through a relevant Ministry quarterly. This budget is fixed and is adjusted for inflation annually. Institutions determine how the finances are used within their institution, and such budgets have to cater for operations and aspects of assessment. In some cases, students have to supplement the institution specifically related to assessment.

“...another thing is that this CBE is quite expensive because you'll find that we need to take students for a lot of placements. Our institution has to make sure the money given by the government is enough for everything...” (P2SN4)

These NEIs were recipients of the Nursing Education Partnership Initiative (NEPI, 2012; Nyoni & Botma, 2020) which was a multi-million dollar grant from the United States of America aimed at upscaling and upskilling nursing and midwifery education in Africa. Through this grant, these NEIs have built several facilities that have a direct influence on assessment. All the institutions were equipped with simulation laboratories which include high-technology electronic mannequins. The internet, devices for teaching and learning and an effective electronic-based learning management

system were established. These resources were reported as influencing the feasibility of implementing PA.

“...Starting with practical assessment we have the simulation which is equipped with different levels of fidelity of mannequins which are used in the different levels of assessment depending on the program and also the exit level outcomes that we are assessing...” (P2N3)

However, the challenge that is associated with the use of technology in the NEIs. The educators have limited capabilities of how to use the simulation equipment.

“... Formatively we try, but also there's still a problem of training such that we are, very good with facilitation of teaching and learning electronically or through online platforms...”

Discussion

Programmatic assessment has been reported as a significant component of CBE (Van Melle *et al.*, 2019). While there are widespread reports reflecting the adoption and implementation of CBE in health professions education and specifically nursing (Timmerberg, Chesbro, Jensen, Dole & Jette, 2022) reports on the reporting of PA are skewed to the high-income countries. In this study, we sought to understand the context of the implementation of PA among NEIs that adopted and implemented CBE in a low-income country. Fundamentally, PA influenced the assessment approaches in these nursing schools though there had been reported challenges.

The educators reflect on their roles related to the implementation of PA being specific to developing assessments, marking, writing reports and moderation. While these roles are common in other contexts, (King, *et al.*, 2022), Colbert and Bierer (2022) emphasise the role of educators in PA as understanding assessments in terms of giving feedback after analysing students' work and providing an authentic environment to conduct assessments. Additionally, Colbert and Bierer (2022) point out the necessity of faculty having knowledge of documentation about PA to enhance the quality of

implementation. Given that the nurse educators in the four NEIs operate in a low-resource country where resources including human resources are limited, there is a need for them to do more than develop, moderate, mark and write reports in assessment. True transformation related to the implementation of the PA may be strengthened by faculty development towards quality assurance and curriculum development.

The nurse educators were reported to have varying capabilities in implementing PA. Except for one NEI with an established professional development programme, these capabilities are based on factors including their original training as nurse educators and the initial training at the inception of PA. Continuing professional development programmes have positively influenced the sustained capabilities of educators in implementing innovative assessment approaches (Amirul, Akhmad, Diat, Abdhullah, & Afreni, 2019; Iobst & Holmboe, 2020; King, *et al.*, 2022). In our study, some of the institutions relied on the original training of nurse educators in nursing education, which may not be aligned with CBE or PA. Institutions without continuing professional development programmes could be at risk of compromising the implementation of assessment approaches such as PA hamstringing the true transformation of educational programmes. In addition, the reliance on ‘experience in practice’ may cement incorrect practices that do not align with innovative assessment approaches or best practices.

The organisational culture among the included institutions reflected a reliance on local structures and individuals for the implementation of PA which makes financial and practical sense acknowledging the value and power of local expertise in their context. McAlister (2018) reflects the value of agents or individuals that influence the implementation and sustainability of innovations within contexts. However, local individuals must have sufficient experience and expertise in assessment innovation for true transformation to take place. This expertise may include a recognised understanding of the available best practices in assessment and be involved in relevant assessment discourse (Schut,

Heeneman, Bierer, Driessen, Van Tartwijk, Van der Vleuten, 2020). In our setting, the majority of the nurse educators have a generic nursing degree without any specialist knowledge of assessment which may compromise their understanding of the principles of PA resulting in incorrect implementation of PA. The literature explains this as the Dunning-Kruger effect which enshrines unconscious incompetence (Rahmani, 2020).

Implementing PA has been reported to be resource-intensive (Cheptoo, 2019; Akala, 2021). The NEIs in this study had been privileged to have sufficient infrastructure for the implementation of PA - including simulation facilities, policies, committees and human resources. Most of the NEIs are adjacent to referral hospitals, which creates a crucible of opportunities for the implementation of various assessment methods. CBE is underpinned by the implementation of assessments in authentic contexts that have been reported to increase the validity of assessment (Vasquez, Marcotte & Gruppen, 2021). However, financial constraints influence the benefit of these established innovations, such as where there are limited funds for consumables, maintenance of the simulation equipment, student transport to other facilities and the engagement of additional staff for assessment (Cheptoo, 2019; Vasquez, *et al.*, 2021). A closer look at this monetary situation shows that the equitable allocation of funds to institutions does not align with curriculum reforms as mandated by the government (Akala, 2021). Governments that benefit from competent nurses must invest financially in their NEIs to enable the implementation of CBE.

Limitations

The self-reported data poses a probability that participants could have provided socially acceptable responses. Nonetheless, this does not eliminate the evidence that organisational contexts have a bearing on the implementation of PA in low-income countries. In addition, a limited sample was included in this study- specifically educators with a direct impact on assessment in the NEIs. This limited sample did not necessarily influence the quality of the data presented. As this study was

conducted in one low-income country, some of the contextual nuances may not be relevant to other low-income countries. Further research on other similar contexts is suggested.

Conclusion

This study explored the context of implementing PA in four NEIs within a low-income country. Nurse educators have various roles related to the implementation of PA juxtaposed with limited capabilities. Although there is almost an optimum amount of physical infrastructure to implement PA, institutions provide limited opportunities for continuing professional development related to PA. Funding of NEIs is a barrier to true curriculum transformation that may be experienced in several resource-limited settings.

Recommendations

Based on the findings of this study, the following are recommended:

- Establishment of compulsory continuing professional development programmes for nurse educators in practice related to programmatic assessment;
- Faculty development activities toward quality assurance
- Development of a contextually responsive assessment approach
- Educators should also take ownership of their own development in terms of assessment
- Governments that benefit from nurses must fund NEIs institutions appropriately

True transformation in health sciences education in low-income countries is influenced by understanding the structures within the context. The limitations related to resources directly influence the adoption, implementation and sustainability of innovations in assessment in health professions education. Insights into the complex organisational processes when implementing curricular reforms

within health professions education contexts could counter the threats to true transformation and the sustainability of such change in low-resource contexts.

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4 AN ASSESSMENT APPROACH FOR COMPETENCY-BASED NURSING EDUCATION IN A LOW-INCOME COUNTRY: A CONSENSUS STUDY

*“Consensus doesn’t just happen by magic ... You have to drive it” -
Christine Quinn*

CHAPTER 4

AN ASSESSMENT APPROACH FOR COMPETENCY-BASED NURSING EDUCATION IN A LOW-INCOME COUNTRY: A CONSENSUS STUDY

4.1. INTRODUCTION

Curriculum innovation towards the competency-based curricula has been associated with a resource-intensive approach to assessment namely, programmatic assessment. Adoption of CBNE by NEIs in a low-income country was faced with challenges regarding the implementation of the programmatic assessment approach to measure the attainment of competency by students. Programmatic assessment implementation has been reported to have been successful in some high-income countries with a dearth of research output from low-income countries.

Implementation of educational innovations has to be contextually oriented to yield positive results. Therefore, this study aimed to develop an assessment approach for use in CBNE in a low-income country using contextual assessment information from the NEIs, literature on assessment approaches retrieved using a mapping review. The developed assessment approach was validated by a panel of assessment and CBE experts in a modified e-Delphi technique.

The previous chapter reported on the results of structured interviews that were conducted to explore the contexts at the four purposefully selected NEIs that implemented competency-based education and programmatic assessment. This chapter presents the development of the assessment approach and the modified e-Delphi technique.

4.2. MANUSCRIPT DETAILS

Title	An assessment approach for competency-based nursing education in a low-income country: A consensus study
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Journal	Nurse Education in Practice
Journal details	A journal that publishes double-blinded peer-reviewed research articles
Status	To be submitted to the Nurse Education in Practice Journal

4.2.1. JOURNAL INFORMATION

Nurse Education in Practice is a peer-reviewed journal that publishes articles in nursing, midwifery and healthcare education. The aim of the journal is to publish leading international research and scholarship on the practice of nurse and midwifery related education.

4.2.2. SUBMISSION RECORD

The manuscript is yet to be submitted to the journal.

4.2.3. CONTRIBUTION RECORD

All three authors conceptualized the paper. The candidate was responsible for data collection and analysis, with contributions from the research supervisors. The candidate drafted the manuscript with academic oversight from the research supervisors.

4.2.4. ASSOCIATED ADDENDA

Addendum N: Author guidelines for Assessment and Evaluation in Higher Education

4.3.MANUSCRIPT THREE

Abstract:

Background

The adoption of the competency-based curriculum by health professions education institutions in low-resource settings was linked with a shift of assessment approaches towards the programmatic

assessment. Assessment is critical in measuring the growth of students towards competency during their learning process. However, the implementation of this approach in low-income countries is not simple since it has its origins in high-income countries. Nursing education institutions in a low-income country reported challenges in implementing programmatic assessment after adopting competency-based education. These challenges threatened the outcomes of the assessment innovation.

Methods

A modified e-Delphi technique was used to refine and validate the developed assessment approach. Purposive sampling included 20 nurses with expertise in assessment from low-income countries. The panellists had to validate the six domains and applications at their micro, meso and macro levels of the developed assessment approach. A $\geq 70\%$ consensus was to be reached by the expert panellists to conclude the e-Delphi process. The population was all assessment and CBE experts in low-and middle-income countries. Purposive sampling was used to select a sample of 20 panellists. Selection was done according to the number of publications the individual had on assessment and CBE.

Results of the consensus

Ten experts were willing to participate, while only nine participated. The e-Delphi process was concluded in two iterative rounds where expert panellists reached a $\geq 70\%$ consensus. From the 47 items, 11 times did not reach consensus and were sent for Round 2. A total of 36 items of the developed assessment approach were included in the final approach.

Twenty prospective panellists were contacted via emails but ten responded showing interest in participating. The results report on the developed assessment approach for competency-based education in a low-income country.

Conclusion

The development of a contextually relevant assessment approach should be underpinned by empirical evidence and knowledge of the context. Validation of the assessment approach should be done by assessment experts to enhance validity of the developed artefact. Nurse education institutions should support and enhance faculty development in assessment to enhance the implementation and sustainability of the assessment approach.

Keywords

Assessment approach; Assessment experts; Context; Nursing education; Validation; Programmatic assessment

Introduction

Assessment strategies, approaches and models must be feasible and relevant to the context. The adoption of competency-based nursing education, which is being advocated for by various stakeholders including the World Health Organization (WHO) (WHO, 2022), has direct implications on how nursing students are assessed. Programmatic assessment (PA) is an essential component of competency-based education (CBE) (Van Melle, Frank, Holmboe, Dagnone, Stockley & Sherbino, 2019) and challenges contemporary assessment approaches by increasing opportunities for assessment and feedback while integrating various assessment methods to align with learning outcomes resulting in defensible assessment outcomes (Bok, de Jong, O'Neill, Maxey, & Hecker, 2018; Ryan, O'Mara & Tweed, 2023). Successful outcomes of implementing PA are reported in high income countries (Van der Vleuten, Lindemann & Schimdt, 2018; Cheptoo, 2019) with limited studies from low-resource settings in as much as there are reports on the adoption of CBE (Roberts, Khanna, Bleasel, Lane, Burgess, Charles & Rutzou, 2022). The context of educating nurses must be considered when implementing CBE and PA (Pinpathomrat, Piluntanaporn, Akaraborworn, Thammasitboon, Dissaneevate & Chamniprasaa, 2023).

The education of nurses varies across contexts. The availability of resources, the types of students, the educators, learning outcomes, disease patterns, communities and types of curricula are among the few critical factors that influence the education of nurses (Nilsen, Seing, Ericsson, Birken & Schildmeijer, 2020). Low-income settings are characterised by high student to nurse educator ratio (Hill & Abhayasinghe, 2022), limited clinical placement opportunities (Gassas, 2021; Hill & Abhayasinghe, 2022), outdated educational practices (Whitehorn, Fu, Porritt, Lizarondo, Stephenson, Marin, Gyi, Dell, Mignone & Lockwood, 2021), fragmented accreditation systems (Dovdon, Park & McCarley, 2022) and the lack of sufficient investment for educational development (Rybarczyk, Ludmar, Broccoli, Kivlehan, Niescierenko, Bisanzo, Checkett, Rouhani, Tenner, Geduld & Reynolds, 2020). These elements of the context must be considered when developing and implementing nursing education programmes in low-resource settings, supporting the need for a plural perspective towards evidence-based educational practice (Grant, 2019). However, overwhelming evidence suggests that transplanting educational practice from high-income settings to low-income settings is often unsustainable and may result in curriculum drift, where the learning experiences are not aligned with the intended curriculum outcomes (Woods, 2015). Therefore, the

adoption of CBE and PA should be tailor-made to align with the contextual realities of the intended setting for better educational outcomes.

Nursing education institutions (NEIs) in Lesotho where the study was conducted, were supported through an international grant to transform their curriculum (NEPI, 2012). Competency-based nursing education underpinned all undergraduate nursing programmes, the curriculum development process and the curriculum are reported by Botma and Nyoni (Botma, 2014; Botma & Nyoni, 2015). Subsequently, PA was adopted as an assessment approach to align with competency-based education (Van Melle, Holmboe, Dagnone, Stockley & Sherbino, 2019). The newly adopted assessment approach resulted in the introduction of different assessment methods, increased opportunities for assessment and feedback, introduction of different approaches to standard setting, further impacting on the overall administration and oversight of assessments for the NEIs in the country (Nyoni & Botma, 2019; Shawa, Masava, Mutimbe, Nyoni, Mokhele, Mukurunge & Nyoni, 2023). However, stakeholders that have implemented this programme over the years have reported challenges related to the implementation of PA. The NEIs struggle with resources for student assessments, limited funding and investment for assessment, a shortage of educators for successful implementation of PA and governance issues related to assessment (Moabi & Mtshali, 2021). These challenges related to the implementation of PA have also been reported in other low-resource settings (Pinpathomrat et al., 2023). Ultimately, the outcomes of implementing PA resulted in these assessments being inconsistent, and fragmented with the potential of negatively influencing the outcome of implementing CBE. An assessment approach that integrates the contextual realities of this setting was deemed necessary.

To strengthen the implementation of competency-based nursing education in this low-income country, we developed an assessment approach that aligns with the contextual realities of implementing CBE in a low-income setting. In this paper, we describe the development process, the assessment approach and the outcomes of an e-Delphi study to validate this assessment approach. We argue that validating an educational innovation through engaging the consensus of expertise within the context has a higher potential of enhancing the validity of an educational artefact.

The development of the assessment approach for competency-based nursing education

We developed an assessment approach for the implementation of competency-based nursing education in Lesotho in response to the need of a more feasible alternative to the assessment approach being used in the setting. Design science research was applied to frame the multi-phase approach of

designing this assessment approach, by integrating results from a mapping review (Mukurunge *et al.*, n.d.) and

semi-structured interviews (Mukurunge *et al.*, n.d.). Through collaborative synthesis, the authors integrated the findings from the preceding phases of the study to present an assessment approach for competency-based nursing education in a low-resource setting.

The mapping review explored the characteristics of different assessment approaches, frameworks, models, and methods used in undergraduate health professions education. Studies published between the years 2000 and 2022 were retrieved. Analysis of the data from the mapping review revealed that the Quarter model (Singh, Anshu & Modi, 2012; Gupta, Shah & Singh, 2021) had some resemblance to the competency-based curriculum and had the underpinning of the programmatic assessment approach in its implementation (Mukurunge, Hugo & Nyoni, n.d.). Therefore, some aspects of the Quarter model can be adopted in the development of the new assessment approach.

The semi-structured interviews which were embedded in the environment domain of the design science research (DSR) framework, (Weber, 2012) sought to describe the institutional assessment contexts at the four selected NEIs in a low-income country according to the following: the people according to their roles and capabilities; the organisation in terms of its strategies, structures, culture and processes; and the technology to describe the technological infrastructure and developmental capabilities. Deductive thematic analysis of data was utilised (Braun & Clarke, 2022). The complete details of the semi-structured interviews are presented in a separate document (Mukurunge *et.al.*, n.d.). Thematic analysis yielded six domains that describe the context of an organisation with applications at three operational levels namely the micro, meso- and macro levels, which are illustrated in Table 1.1.

The outcome of the development process was an assessment approach for competency-based nursing education in low-resource settings, Addendum P.

Table 1.1: The six domains from the thematic analysis of data from structured interviews

DOMAINS	MICRO LEVEL	MESO LEVEL	MACRO LEVEL
1. Curriculum, Academic planning and moderation	1.1.1 Educators as moderators 1.1.2 Educators as assessors 1.1.3 Educators as trainers	1.2.1 Yearly master plan reflecting assessment schedule per module 1.2.2 Moderation of all assessments 1.2.3 Appropriate and cost-effective assessment method 1.2.4 Competency-based curriculum 1.2.5 Student-centred learning 1.2.6 Physical resources for assessment 1.2.7 Infrastructure for e-assessment 1.2.8 Cybersecurity related to institutional assessments	1.3.1 Institutional/independent assessment practice 1.3.2 National standardised infrastructure for assessment
2. Faculty capacity and development	2.1.1. Capacity development on assessment and moderation 2.1.2. Capacity development on evidence-based assessment and research in assessment	2.2.1. Educator performance appraisal 2.2.2. Educator essential assessment competencies 2.2.3. Monitoring maintenance of educator essential assessment competencies 2.2.4. Monitor research output in Assessment	2.3.1. National strategy for faculty development on Assessment 2.3.2. Continuing Professional Development in Assessment 2.3.3. National Nurse Educator Faculty Development Coordination
3. Stakeholders		3.2.1. Involve students in assessment evaluation. 3.2.2. Internal mechanism/committees for monitoring assessment	3.3.1. Professional authorities/bodies that monitor assessment. 3.3.2. Clear terms of reference for organisation boards regarding institutional assessment strategy 3.3.3. External mechanism/committees for monitoring assessment

DOMAINS	MICRO LEVEL	MESO LEVEL	MACRO LEVEL
4.Evidence Based Practice	4.1.1. Evidence-based assessment practices	4.2.1. Periodic review of assessment practice 4.2.2. Adoption of innovative evidence-based assessment practices	4.3.1. Partnership with external institutions/bodies on research in assessment
5.Assessment Methods, techniques, Blueprints	5.1.1. Logbooks, checklists, 5.1.2. Training of supplementary human resources on assessment	5.2.1. Blueprint of all learning outcomes 5.2.2. Relevant and updated taxonomy for assessment 5.2.3. Assessment policy aligned with the curriculum model and assessment design principles.	
6.Organisation and Finances	6.1.1. Capacity development for administrative staff on budgeting for assessment	6.2.1. Budget for assessments 6.2.2. Budget for capacity development in assessment 6.2.3. Budget for technology related infrastructure for assessment 6.2.4. Institutional meetings and planning for assessments	

The assessment approach was developed from the consolidation of the six domains from the structured interview and the Quarter model from the mapping review. Figure 1 illustrates the developed assessment approach.

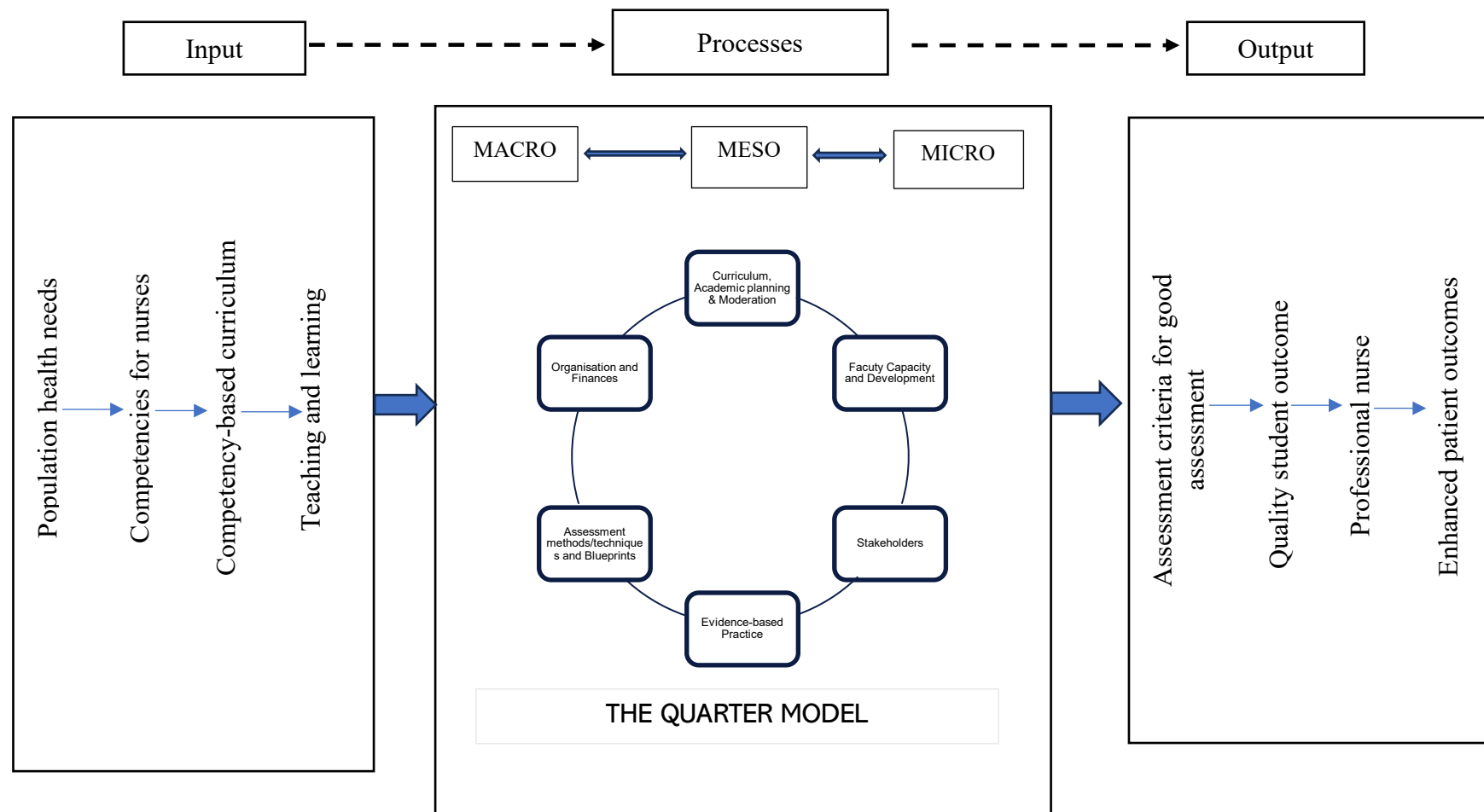


Figure 1.1: The developed Assessment approach for competency-based nursing education in a low-income country

The Assessment Approach for Competency-Based Nursing Education in Lesotho, a low-income country

The assessment approach in Figure 1.1 is enacted at three levels of decision-making. The micro level, that is, in the classroom and the clinical area, where educators interact with students as they administer assessments. The meso level refers to the organisational level where structures in the organogram make institutional decisions about the implementation of assessment. At the macro level activities and decisions about assessment are made outside the NEIs by external stakeholders. The external stakeholders include professional and accreditation bodies for example the Lesotho Nursing Council. The Assessment approach follows a Systems approach of Inputs, processes and Outputs (Hastuti, Zahro, Untari, Rahman & Tahar, 2021).

Inputs

The inputs to a system are raw materials that can be processed into outputs (Sidik, 2022). However, the raw materials can take different forms, not necessarily the physical form. A competence-based programme is set to produce competent lifelong learning healthcare professionals who can work towards the reduction of the disease burdens in their context. Therefore, in this assessment approach, the antecedents include the health needs of the population, competencies that the health professionals should possess, the teaching and learning activities of the programme encapsulated in the competency-based curriculum (see Figure 1.1). These inputs are intertwined and they inform each other. The development of a relevant competency-based curriculum needs a thorough exploration of the health needs (Lopez-Medina, Álvarez-Nieto, Grose, Elsbernd, Huss, Huynen & Richardson, 2019). The findings of the exploration of the population's health needs determine the competencies that the nurses should possess, which will be incorporated into the curriculum and hence inform the teaching and learning activities.

Processes

The process part of the system is where decisions about inputs in the production of outputs are made (Galais, Fernandez, Font & Smith, 2020). In this assessment approach, the processes to be followed in the implementation of assessments will be at micro, meso-, and macro levels. The micro level covers the implementation of assessment on a day-to-day basis in the classroom and in the clinical area. At the meso level, assessment implementation is monitored

at the organisational level. The organisational level includes key offices of decision-making that appear in the organogram of the institution like the Quality Assurance Office, offices of heads of programme and the Academic Head. At the macro level, external stakeholders are involved in monitoring the implementation of assessments in national training institutions. The external stakeholders include governing bodies like the Nursing Council, the Ministry of Health, the Academic Senate, the Institutional Board, and the Council on Higher Education. Processes involved in assessment at the three levels of decision-making will be discussed for each of the six domains that emanated from the thematic analysis of data gathered from structured interviews in Phase 1 of the study.

Domain 1: Curriculum, academic planning and moderation

In Domain 1, the curriculum, academic planning and moderation of assessments are essential in the designing and quality assurance of assessment. At the macro level, the curriculum should be a competency-based learner-centred curriculum which is underpinned by educational theory and principles such as constructivism (Vygotsky & Coleman, 1978; Holmes, Polman & Turner, 2021), constructive alignment (Biggs, 1996; Cammies, Cunningham & Pike, 2022), scaffolding (Wood, Bruner & Ross, 1976; Margolis, 2020; Masava, Nyoni, & Botma, 2023) and authenticity (Roach, Tilley & Mitchell, 2018). National standards for assessment implementation should be modified to the standard of CBE. At a meso level, the key offices in the institution should ensure the implementation of the competency-based curriculum and the development of a clear yearly master plan of academic activities that reflects assessment schedules per module. Appropriate and cost-effective assessment methods should be utilised in both theory and clinical assessments. Physical resources for the implementation of assessment like the classrooms, clinical areas and simulation laboratories should be made available. In order to secure assessments during their development and transfer between examiners and moderators electronically, features of cybersecurity should be put in place by the key offices in the institution. Implementation of assessment at the micro level requires educators who are competent as assessors and moderators of assessments. This can be achieved through assessment training workshops where dedicated knowledgeable educators in assessment are assigned to facilitate the assessment workshops for other educators in the institution. In addition, the strategy should outline competencies required in continuous professional development in assessment implementation for educators.

Domain 2: Faculty capacity and development

Faculty capacity and development in assessment is the focus of Domain 2. At the macro level, it is essential to develop a national strategy for faculty development on assessment. The office's mandate will be to develop a strategy to empower and monitor faculty development in terms of assessment as well as assessment competencies that educators should possess. At the meso level, the key offices in the institutions should draw institutional essential assessment competencies from the national strategy on faculty development. The institutional assessment competencies should have an inherent monitoring strategy for the attainment of these competencies by educators. Faculty development in assessment can also be monitored through scheduled periodic performance appraisals of educators. At the micro level assessment workshops should be facilitated to all members of staff by competent dedicated faculty members. In addition, staff should be encouraged to take ownership of their own learning by engaging in self-directed learning activities which include enrolling in free Massive Open Online Courses

Domain 3: Stakeholders

The external stakeholders assume both monitoring and advisory roles in institutional assessment implementation. The Ministry of Health and the Nursing Council can establish external committees for the uniform monitoring of assessment implementation by national institutions. Each institution should have an Academic Senate made up of professional experts capable of monitoring and advising on assessment implementation. There should be clear terms of reference in place for institutional boards so that assessment strategies are implemented seamlessly regardless of the individuals that occupy positions on the boards. At the meso level, student feedback on assessment can be used in the development of assessment checklists. Institutional assessment committees can be established for monitoring assessment implementation.

Domain 4: Evidence-based practice

Domain 4 of evidence-based practice refers to institutions undertaking assessment-related research, adopting and using guidelines and practices informed by research. At the macro level institutions should engage in partnerships with external institutions on assessment research to enhance research output and capabilities. At the meso level institutions should have a culture of reviewing assessment practices and adopting innovative evidence-based assessment practices. At the micro level educators should implement assessment using evidence-based practices.

Domain 5: Assessment methods, techniques and blueprints

In order to implement affordable and reliable assessments institutions should ensure the selection of the correct assessment methods for given learning outcomes. There are various assessment methods in use for both theory and practice. At the meso level, the Assessment committees and Academic committees should develop blueprints according to current or revised taxonomies like the Krathwohl taxonomy (Krathwohl, 2010). The blueprints should be aligned with learning outcomes for all modules in the curriculum. Institutions should develop assessment policies that are aligned with the curriculum to guide assessment implementation. At the micro-level educators should administer assessments utilising the appropriate and feasible assessment methods. For example, results from the interviews in Phase 2 revealed that implementation of Objective Structured Clinical Examinations (OSCEs) as an assessment method in a competency-based curriculum is resource intensive. Liu (2012) introduced workplace-based assessments arguing that OSCEs tend to deconstruct the patient-practitioner interaction further affecting the validity of assessments. The workplace-based assessments are more authentic than OSCEs because they take place in a real clinical context (Reid, Gormley, Dornan, & Johnston, 2021). All the areas of competence expected in Miller's pyramid are addressed. According to Liu (2012), assessment of competencies in the clinical area is cost-effective since there is no need to train standardised patients and the resources that the student will use in the assessment belong to the clinical area. Examples of workplace-based assessment methods that can be used are Direct observation of procedural skills; mini-clinical evaluation exercises and case-based discussions. Therefore, in the implementation of cost-effective assessments in CBNE, NEIs can consider adopting workplace-based assessments.

Domain 6: Organisation and finances

In order to operate at their optimum level, all departments in institutions should be operating in sync. Therefore, Administrative staff in institutions should get training on budgeting processes for assessment activities in the programme. At the meso level, the administrative staff should develop budgets that pertain to assessment in terms of capacity development of educators, and technology-related infrastructure like computers. Administrative staff should take part in institutional meetings where planning for assessment takes place. At the micro level, the administrative staff should attend capacity-building workshops on budgeting for assessment activities in the institution.

Outputs

Outputs are the results of the processing of the inputs (Galais, Fernandez, Font, & Smith, 2020). As shown in Figure 2, the outputs are assessment criteria for good assessment, quality student outcomes, professional nurses, and enhanced patient outcomes. There is interaction among the elements of the outputs.

Purpose of the study

The purpose of this study was to refine and validate the developed assessment approach by a panel of experts in educational assessment.

Methods

A modified e-Delphi technique was used in the refinement and validation of the developed assessment approach. In this study, the modified Delphi was utilised instead of a Classical Delphi because there was no initial open round to generate ideas. Rather, the initial idea was the developed assessment approach. Consensus was reached with a $\geq 70\%$ consensus on the components of the developed assessment approach (Hong, et al., 2019). The modified e-Delphi technique is adopted to reach a consensus on a topic among a panel of experts in a particular field (Iqbal & Papon-Young, 2009). The entire process of conducting a Delphi study followed the Conducting and Reporting of Delphi Studies (CREDES) guidelines (Junger, Payne, Brine, Radbruch, & Brearley, 2017). According to the CREDES guidelines experts of diverse experience must be included in a Delphi study irrespective of their geographical location. The Delphi process is conducted anonymously to avoid social pressure emanating from the need to conform to the most dominant view (Williamson, Kelly, Tomasone, Bauman, Mutrie, Niven, Richards & Baker, 2021). The procedure is iterative in nature with a minimum of two rounds, with the design of subsequent rounds being informed by a summary of the responses from the previous round (Junger et al., 2017). In this paper, the modified e-Delphi technique refers to the method while the modified e-Delphi process refers to the entire process of consensus building. The assessment approach questionnaire was piloted on two local assessment experts before dissemination to the panellists.

Selection of the panel of experts

Purposive sampling was used in the selection of 20 members of the panel of experts in assessment. The literature suggests that at least 10 to 50 expert members per panel are required to achieve a wide range of opinions (Iqbal & Papon-Young, 2009; Williamson *et al.*, 2021).

The inclusion criteria for the panellists were: nurses from low-income countries with qualifications in education and assessment or are published in educational assessment and nurses from low-income countries with qualifications or publications in curriculum design and development. The prospective participants for the modified e-Delphi were identified during the mapping review and contacted using their email addresses obtained from their contact details that are available in their published articles. Twenty prospective panellists were contacted via emails but ten responded showing interest in participating. In the emails, the aim, process and possible risks and benefits of the expert consultation were communicated. Written consent was received from ten expert panellists who participated in the modified e-Delphi process. The modified e-Delphi process took two iterative rounds for the expert panellists to reach a $\geq 70\%$ consensus. For each round, all responses were collected and analysed anonymously.

Round 1 of the Delphi

A Google form was developed which contained statements that make up the assessment approach, that is the six domains and their application at their micro, meso and macro levels. Accompanying the google form was a comprehensive narration, in word format, of the domains and their application at the micro, meso and macro levels to allow the panellists to make informed decisions. Panellists were to decide whether the statements were clear and relevant in the developed approach by selecting either a “yes” or “no” response and provide a reason for a “no” response. Panellists were given two weeks to work on the document. Statements that had $< 70\%$ consensus among the panellists were discussed by the three authors and fed back into Round 2 of the Delphi after the suggested amendments were made.

Round 2 of the Delphi

A second Google form was created which contained the revised statements and was sent to the panellists for them to decide if the amendments were correct. Panellists were given a week to work on the revised statements. All the statements after round two received a more than 70% agreement and hence no need for a further round.

Results

Characteristics of the participants

From the ten experts (n=10) that indicated interest to participate, only (n=9) participated in the e-Delphi. Table 2 shows the demographics of the participants.

Table 1.2: The demographics of the panellists

Participant No.	Country of practice	Highest qualification	Years of experience in education and assessment
1.	Malawi	PhD	20 years
2.	Kenya	PhD in Nursing	8 years
3	Thailand	Masters in Biomedical Sciences	35 years
4	Rwanda	PhD	18 years
5	South Africa	PhD	34 years
6	South Africa	PhD	27 years
7	Kenya	PhD	10 years
8	South Africa	PhD	37 years
9	Lesotho	PhD	20 years

Three of the panellists were from South Africa. The majority of the panellists (n=8) held a PhD degree. The panellists had between eight to 37 years of experience in education and assessment.

The assessment approach critiqued in the Delphi process

The assessment approach had six domains and their applications at the micro, meso and macro-organisational levels. Table 3 illustrates the Delphi process results in Round 1 and 2.

Table 1.3: Domains, their levels of application, and agreement rates in the modified e-Delphi technique

No.	Description	Round 1	Round 2
1.	Domain 1. Curriculum, Academic planning, and moderation	62.5 %	100%
	<i>Micro level</i>		
1.1.1.	Educators as moderators	100 %	
1.1.2.	Educators as assessors,	100 %	
1.1.3	Educators as trainers	75 %	
	<i>Meso level</i>		

No.	Description	Round 1	Round 2
1.2.1.	Yearly master plan reflecting assessment schedule per module	100 %	
1.2.2.	Moderation of all assessments	87 %	
1.2.3.	Appropriate and cost-effective assessment method	100 %	
1.2.4.	Competency-based curriculum	100 %	
1.2.5.	Student-centred learning	100 %	
1.2.6.	Physical resources for assessment	87.5 %	
1.2.7.	Infrastructure for e-assessment	87.5 %	
1.2.8.	Cybersecurity related to institutional assessments.	100 %	
	<i>Macro level</i>		
1.3.1.	Institutional/independent assessment practice	100 %	
1.3.2.	National standardised infrastructure for assessment	Missing	87.5%
2.	Domain 2: Faculty capacity and development	75%	
	<i>Micro level</i>		
2.1.1.	Capacity development on assessment and moderation	Missing	87.5%
2.1.2.	Capacity development on evidence-based assessment and research in assessment	87.5 %	
	<i>Meso level</i>		
2.2.1.	Educator performance appraisal	75 %	
2.2.2.	Educator essential assessment competencies	87.5 %	
2.2.3.	Monitoring maintenance of educator essential assessment competencies	87.5 %	
2.2.4.	Monitoring research output in Assessment.	87.5%	
	<i>Macro level</i>		

No.	Description	Round 1	Round 2
2.3.1.	National strategy for faculty development on Assessment	62.5%	100%
2.3.2.	Continuing Professional Development in Assessment	75%	
2.3.3.	National Nurse Educator Faculty Development Coordination	75%	
3.	Domain 3: Stakeholders	75%	
	<i>Meso level</i>		
3.2.1.	Involve students in assessment evaluation.	87.5%	
3.2.2.	Internal mechanism/committees for monitoring assessment	87.5%	
	<i>Macro level</i>		
3.3.1.	Professional authorities/bodies that monitor assessment.	87.5%	
3.3.2.	Clear terms of reference for organisation boards regarding institutional assessment strategy	75%	
3.3.3.	External mechanism/committees for monitoring assessment	75%	
4.	Domain 4: Evidence-based practice	87%	
	<i>Micro level</i>		
4.1.1.	Evidence-based assessment practices	100%	
	<i>Meso level</i>		
4.2.1	Periodic review of assessment practice	87%	
4.2.2.	Adoption of innovative evidence-based assessment practices	87.5%	
	<i>Macro level</i>		
4.3.1.	Partnership with external institutions/ bodies on research in assessment	87.5%	
5.	Domain 5: Assessment methods/ techniques/ blueprints	62.5%	100%
	<i>Micro level</i>		
5.1.1.	Logbooks, checklists,	Missing	100%

No.	Description	Round 1	Round 2
5.1.2.	Training of supplementary human resources on assessment	Missing	100%
	<i>Meso level</i>		
5.2.1.	Blueprint of all learning outcomes	87.5%	
5.2.2.	Relevant and updated taxonomy for assessment	75%	
5.2.3.	Assessment policy aligned with the curriculum model and assessment design principles.	0%	Taken out
6.	Domain 6: Organisation and finances	87.5%	
	<i>Micro level</i>		
6.1.1.	Capacity development for administrative staff on budgeting for assessment	75%	
	<i>Meso level</i>		
6.2.1.	Budget for assessments	87.5%	
6.2.2.	Budget for capacity development in assessment	62.5%	87.5%
6.2.3.	Budget for technology related infrastructure for assessment	62.5%	87.5%
6.2.4.	Institutional meetings and planning for assessments	62.5%	75%

Of the 47 items (n=47) included during Round 1 of the e-Delphi, (n=36) items reached consensus with > 70%. In the first round, domain 5 had two missing items at the micro level. These were included in the second as shown in Table 1.3. Eleven items (n=11) were sent for Round 2 for consensus again. Only (n=1) item was removed from the developed assessment approach.

Discussion

Nurses must be competent at graduation to influence health outcomes in the communities they serve. ‘Good assessment’ (Norcini *et al* 2022) is fundamental in ensuring that safe and competent nurses graduate. Assessment approaches reflect an integration of theories and principles used in implementing assessment in an educational programme. The programmatic assessment approach is associated with competence-based nursing education and has been reported as impactful in influencing valid and reliable assessment outcomes (Van der Vleuten, Lindemann, & Schimdt, 2018) However, NEIs in a low-resource setting that adopted CBNE

face challenges in implementing PA within their contexts (Shawa *et al.*, 2023; Bvumbwe & Mtshali, 2018). We designed a feasible assessment approach for NEIs based on findings from a low-resource country that had adopted CBNE for more than five years (Shawa *et al.*, 2023). In this paper, we report the outcomes of a validation study on the components of the assessment approach by experts in education assessment in the region.

The majority of the panellists in the modified e-Delphi (n=3) were from South Africa. Implementation of educational innovations requires paradigm shifts in organisational systems and extensive knowledge of the context of the organisation (Pinpathomrat *et al.*, 2023). Knowledge of the organisational context which includes the culture, the human resources, the technology and the “deep” structures of the organisation is important to avoid resistance to change (Akala, 2021). Therefore, recruiting a panel of assessment experts in the validation of the developed assessment approach is critical since contextual experts have experience and their opinions matter in giving validity to developed artefacts (Veugelers, Gaakeer, Patkar & Huijman, 2020). This could have had a positive influence on the expert decision they made because they had a better understanding of the context of the low-income country. However, the outlier from Thailand did not have any different decisions than the rest maybe because they have their origins in Africa and understand to some extent the operations in low-income countries.

Language was a limitation to the recruitment of expert panellists since recruitment was only from English-speaking low-income countries. Yet there is a large population of non-English speaking low-income countries. Expertise contribution was only limited to English-speaking experts yet the greater population is Mandarin-speaking (Julian, 2019). However, in another dimension, the fact that the panellists used English language in the Delphi had an advantage. It helped in bringing people from different contexts together and their experiences from different countries with varying native languages and practices to contribute to the development and validation of the assessment approach. However, if panellists from other majority-spoken languages such as Mandarin, Spanish, and French were involved, the contributions could have been richer and would have helped capture global experiences.

The developed assessment approach has six domains. In domain one, the curriculum, academic planning and moderation of assessments are essential in the assessment approach at all the micro, meso and macro levels of decision-making. However, capabilities are limited among educators in low-income countries to interpret the CBE curriculum, to plan and moderate

assessments in the new assessment approaches as illustrated in domain two of the assessment approach, that the capabilities of educators in their different roles is essential. The innovations in education have brought multiple roles for the educators including facilitation of learning, curriculum and module planner, creation of resource materials, mentoring students and program evaluation, and use of technology in implementing assessment amongst others. Therefore, NEIs in low-income countries need to invest in the building of capacity among educators through the establishment of training workshops (Iobst & Holmboe, 2020). The NEIs can compile mandatory assessment competencies that educators should renew annually under the supervision of their line managers. NEIs can establish collaborations with other NEIs in the region to engage in benchmarking and join professional associations like SAAHE for capacity building to ensure that educators assess students effectively and accurately. NEIs should develop formal policy on capacity building for educators, as resonated by Srinivas and Adkoli (2009). The Global Alliance for Leadership in Nursing Education and Science (2019) has developed the Global Pillars Framework that provides guidelines for professional nursing education. The framework states that a curriculum that should be utilised in educating nurses should be responsive to the local context and its health needs.

In domain three, the issue of stakeholders in the NEIs was crucial in the implementation of the assessment approach and the panellists agreed with all statements in the first round. Various stakeholders are involved in implementing the assessment according to the level of decision-making involved. For the effective implementation of assessment approach, it is crucial that all stakeholders participate fully. As per the Global Alliance for Leadership in Nursing Education and Science (GANES) (2019), regulatory bodies at the national level should establish standards for assessment implementation, along with monitoring and evaluation guidelines to ensure regular review and monitoring of implementation in NEIs. Sometimes, stakeholders fail to engage due to lack of awareness of what is expected of them. Therefore, it is necessary to provide orientation to all stakeholders about the assessment approach so that they can participate fully in its implementation. The national regulatory bodies can hire external experts who can work with stakeholders in developing guidelines and policies for assessment implementation. According to Rich and colleagues academic advisors play a key role in assessment implementation, as emphasized by Rich and colleagues (Rich, Young, Donnelly, Hall, Dagnone, Weersink, Caudle, Van Melle & Klinger, 2019).

In order to establish and maintain successful education innovations, it is crucial to rely on evidence-based practices, as highlighted in domain 4 of the assessment approach. Educators in NEIs are aware of the importance of conducting research to create evidence in higher education. However, many lack the necessary motivation and capability to conduct such research. Additionally, the definition of evidence that results in universal guidelines, according to Global North standards, fails to include contributions from the Global South, where research output is scarce. Educational research should yield contextual guidelines. Therefore, to address this issue, governments in low-income countries should allocate funds to support research activities in NEIs, thereby generating evidence and building capacity among educators. NEIs can also establish mechanisms for periodic performance reviews to hold educators accountable for their work. Finally, exceptional performance should be recognized and rewarded to keep the educators motivated (Mok & Yeen, 2021).

Domain five refers to the use of various assessment methods, and development of blueprints. The panellists rejected one statement in Domain 5 which stated that “Assessment policy should be aligned with the curriculum model and assessment design principles”. They rejected it for reasons that there were no clear design principles. However, the assessment approach can be utilised to guide assessment implementation.

The use of different types of assessment methods to evaluate the attainment of competency is essential because no one method can be used singly to assess students both in theory and in practice. The choice of assessment methods has a direct influence on the resources that are required for implementation. In this regard, NEIs should use their assessment policies and curricula to guide the choice of assessment method that is both feasible and financially viable in their context. The use of blueprints ensures that no parts of the module content are left without being examined. The challenge that exists in the NEIs is the lack of capabilities among educators to develop blueprints and choose the most appropriate assessment method. Therefore, as stated before, the establishment of faculty development programmes is paramount in enhancing the capabilities of educators (Rich et al., 2019). In addition, institutions should be up-to-date with relevant taxonomies of assessment.

In domain six the NEIs should have functional financial systems that support assessment. The finance departments in the NEIs should be knowledgeable of the processes and strategies that are implemented in assessment. Therefore, the involvement of the finance department in planning meetings for assessment implementation can improve monetary flows towards

assessment implementation. According to the GANES (2019) NEIs should have financial resources to support the establishment of a functional library and internet resources for students to learn to use evidence to inform their learning. However, low-income countries are battling with a lot of challenges that require funding. These challenges include war, low investment, more emergent priorities like infectious diseases, low fiscus, brain drain of the academics by high-income countries. All these challenges demand more money against the demand of libraries and internet in NEIs. Therefore, this study recommends involvement of African development partners and international development partners such as United Nations Educational, Scientific and Cultural Organization (UNESCO), the World Health Organization (WHO), United Nations Development Programme (UNDP), African Development Bank (ADB), Partners for Health and Development in Africa (PHDA)

Strengths and Limitations

The use of the CREDES guidelines in the modified e-Delphi method ensured credible results. The study can be reproducible in similar contexts because of the standard methodology that also has a paper trail of implementation. The inclusion of international panellists with extensive experience in education and assessment ensured that the developed assessment approach was contextually relevant for the NEIs in the low-income country. However, the selection of panellists for the modified e-Delphi method was limited by language. Only English-speaking panellists were selected excluding non-English speaking experts who could have brought in their expert opinions on the assessment approach.

Conclusion

This study presented the development and validation of a contextually relevant assessment approach for competency-based nursing education in a low-income country. Adoption of CBE in nursing was coupled with a shift in the assessment approaches towards PA. However, PA which has its origins in high-income countries has posed challenges for NEIs in its implementation. Hence the development of the assessment approach. NEIs have to set up structures to ensure faculty development in assessment, research curriculum development and use of technology in order to enhance fidelity of implementation of the assessment approach and its sustainability. The academic community in collaboration with national regulatory bodies should source for funding from international development partners. Despite a lack of funding there are many things that can be done to make CBE and its assessment a success.

Institutions can adapt this assessment approach in the contexts to improve to an extent assessment implementation in CBE.

Declarations

The authors declare that the present manuscript is not being considered for publication elsewhere and that it has not been published before.

Competing interests

The authors declare that they have no competing interests.

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Authors contribution

All authors contributed to the study concept, design, data collection and analysis. EM drafted the Delphi survey tools, which were reviewed by CN and LH. EM was responsible for the drafting of the manuscript. All authors read, reviewed, and approved the final manuscript.

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CHAPTER 5

DISCUSSION, RECOMMENDATIONS, CONCLUSION AND LIMITATIONS OF THE STUDY

5.1. Introduction

The previous chapter described the validation of the assessment approach for a low-income country by international experts in assessment through a modified e-Delphi study. In this chapter, the researcher will give an overview of the study as well as its factual and conceptual findings. The significant original contributions to knowledge are discussed including recommendations and limitations.

5.2. Overview of the study

Curriculum reforms towards the CBE curricula in NEIs have been guided by recommendations from governing bodies like the World Health Organization and the International Council of Nurses (ICN, 2022; WHO, 2022). The adoption of CBE is associated with a shift in assessment approaches, from the traditional assessment to the PA approach. Literature has been published on the development and implementation of CBE and PA in high-income countries (Van der Vleuten *et al.* 2018; Cheptoo, 2019). On the contrary, there is a dearth of research output from low-income countries on the implementation of CBE and PA in NEIs (Roberts, Khanna, Bleasel, Lane, Burgess, Charles, Howard, O'Mara, Haq & Rutzou, 2022). As a result, NEIs in low-income countries tend to adopt the proposed PA approach without a thorough understanding of the principles of PA and the implementation strategies that enhance the sustainability educational innovation (Cheptoo, 2019).

This study was conducted in NEIs in a low-income country that adopted CBE. The programmatic assessment was embedded as part of the innovative assessment in the CBE. The NEIs faced several challenges with PA implementation. These challenges included, among others, PA implementation principles that were not feasible in their context, limited human resources, limited capabilities to implement PA, a lack of continuing professional development strategies towards PA implementation, high educator-to-student ratios, and meagre financial resources. Therefore, the study aimed to develop a contextually relevant assessment approach to use in CBE in NEIs in a low-income country.

The research question which guided this study was:

- What would be an appropriate assessment approach for CBNE in a low-income country?

To achieve the aim of the study, the objectives were to:

1. Describe the characteristics of the different assessment approaches in undergraduate health professions education through a mapping review (Phase 1),
2. Explore the assessment context at the selected NEIs which implemented a competency-based curriculum in Lesotho (Phase 2) and
3. Develop, critique, refine and validate an assessment approach for competency-based nursing education for a low-income country (Phase 3).

5.3. Design and methods

The overall purpose and objectives of the study were attained through a sequential multi-methods approach comprising three phases set according to the objectives of the study (see Chapter 1 for a thorough description of design and methods). The three phases of the study were underpinned by the DSR framework as shown in Figure 5.1.

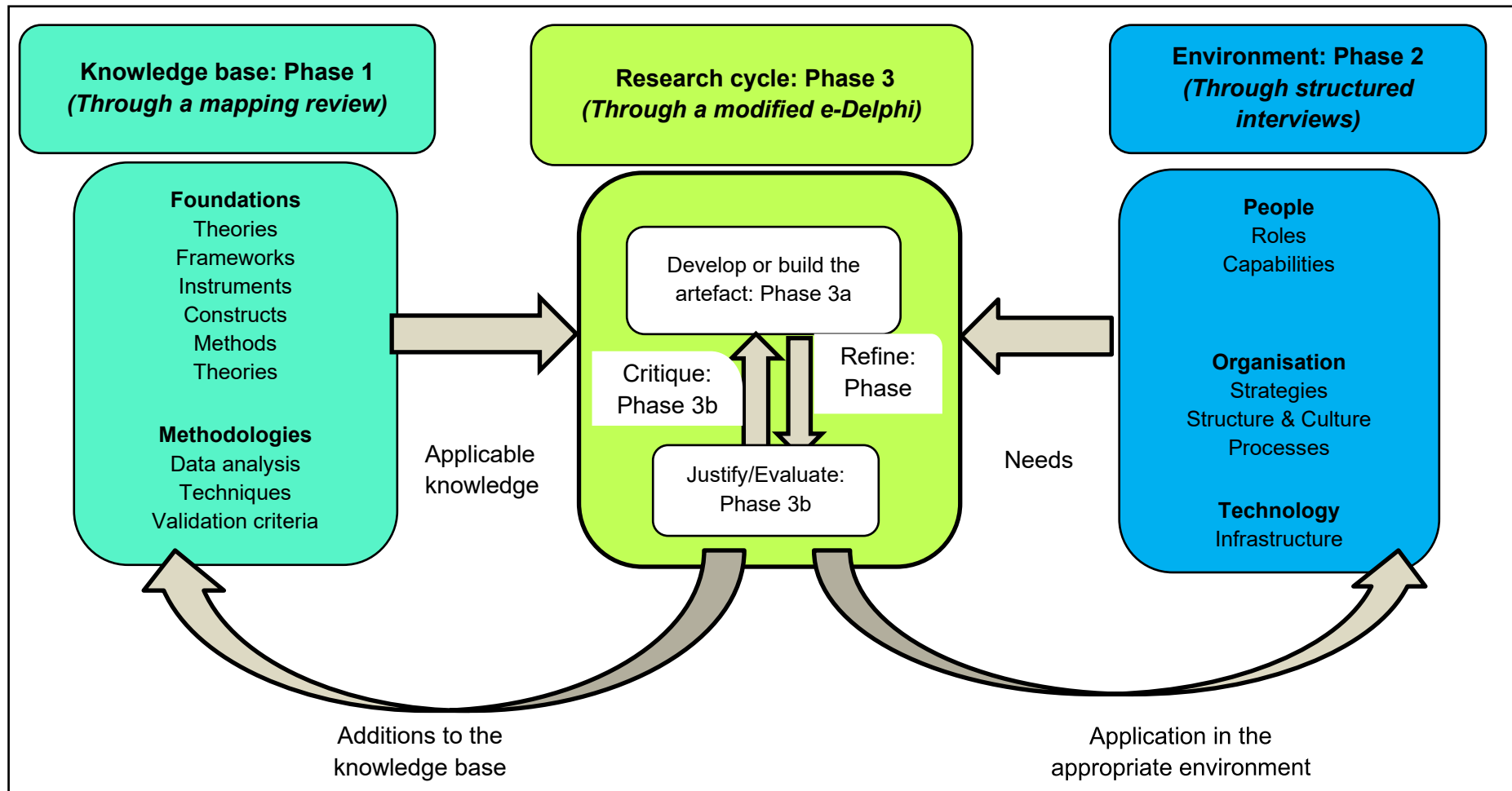


Figure 5.1: Design Science Research method for the development of the assessment approach, adapted from Weber (2012)

The next section presents abridged summaries of the phases, including methods and findings towards the development of the assessment approach.

5.3.1. Phase 1: The mapping review

Objective 1: To describe the characteristics of the different assessment approaches in undergraduate health professions education through a mapping review.

The first phase aimed to describe the characteristics of different assessment approaches in undergraduate health professions education through a mapping review. The steps that were followed in carrying out the mapping review are outlined in the guidelines for conducting systematic reviews by the Evidence for Policy and Practice Information and Co-ordinating Centre (Gough, Kiwan, Sutcliffe, Simpson & Houghton, 2003; Preston, Chambers, Campbell, Cantrell, Turner & Goyder, 2018). For a detailed narration of the mapping review phase see Chapter 2.

5.3.2. Phase 2: Semi-structured interviews

Objective 2: To explore the assessment context at the selected NEIs in Lesotho which implemented CBE.

The aim of Phase 2 was to explore the context of assessment at the NEIs that implemented PA as part of CBE in a low-income country. Findings from the semi-structured interviews were focused on the people, organisation and technology as guided by the environmental phase of DSR framework (Weber, 2012). See Chapter 3 for more details about Phase 2.

5.3.3. Phase 3: Development and validation of an assessment approach for competency-based nursing education for a low-income country

Objective 3: To develop, critique, refine and validate an assessment approach for competency-based nursing education for a low-income country.

The aim of Phase 3 was to develop the assessment approach using the findings from the mapping review and the semi-structured interviews. A modified e-Delphi technique following the recommendations for Conducting and REporting of DElphi studies (CREDES) (Junger, Payne, Brine, Radbruch & Brearley, 2017) was applied to validate and gain consensus from a panel of nine international assessment experts. For more information on the developed and validated assessment approach see Chapter 3.

5.4 Factual and conceptual findings

This section will present the factual and conceptual findings of this study. Factual findings are the actual results gathered from conducting the research while conceptual findings are the conclusions that are drawn from the factual findings of the study. The significance of classifying these findings links to clarifying the contribution of the research study. Table 5.1 illustrates the factual and conceptual findings, presented for each of the phases of the study.

Table 5.1: Factual and conceptual findings of the study

Study objective	Study phase	Factual findings	Conceptual findings
Objective 1: To describe the characteristics of the different assessment approaches in undergraduate health professions education through a mapping review.	Phase 1: Mapping review	There is minimal research output on the topic of assessment with a skew towards high-income countries. Development of an assessment approach requires background knowledge of the following: 1. The assessment approach 2. Assessment frameworks 3. Assessment models, which can be categorised as purely clinical or theoretical or both. 4. Assessment methods	• The skew in implementation and publications towards high-income countries may be that these countries have the resources to implement new assessment approaches and the knowledge and ability to publish their work. • The minimal research output in assessment could be an indication of the link between curriculum reforms and assessment approaches, so institutions are yet to establish their contextually feasible assessment approaches. • The development of assessment approaches should be underpinned by good assessment theoretical frameworks and models like Miller's competency

			pyramid, which can be used to assess different levels of competency. ● A feasible assessment approach should have a variety of assessment methods that can be used for the collection of data points. A single assessment method is not adequate for making high-stakes decisions about the competency of a student.
Objective 2: To explore the assessment context at the selected nursing education institutions that were supported by the Nursing Education	Phase 2: Semi-structured interviews	The findings revealed that an understanding of the context of an institution is essential in the development of an assessment approach. The context of an institution should be described by ● The people in terms of their roles and capabilities. ● The organisation, focusing on its structure, culture and strategies. ● Technology, including development capabilities and the infrastructure.	● The educators in low-income countries should do more than merely develop, mark and moderate assessments, in terms of the implementation of educational innovations. Educators should be involved in policy making, curriculum development and quality assurance, to enhance true transformation in a curriculum.

Partnership Initiative			• The establishment of continuing professional development programmes for educators is essential for the alignment of practice to the proposed assessment approach. • Implementation of the assessment approach should ensure the use of the least expensive assessment methods. For example, using directly observed procedures that take place in the clinical area can lead to cutting down of the running costs of practical assessments using methods like objective structured clinical examinations.
Objective 3: To develop, critique, refine and validate an assessment approach for competency-based nursing education	Phase 3: Modified e-Delphi study	• An assessment approach was developed for implementation in competency-based nursing education in a low-income country • The assessment approach was validated by a panel of assessment experts from low-and middle-income countries.	• An assessment approach was developed underpinned by the Design Science Research theoretical framework. • The development of the assessment approach was informed by literature from the mapping review phase and data about the contextual descriptions of the

for a low-income country			NEIs from the semi-structured interviews. ● Validation of the developed assessment approach by assessment experts who have knowledge of the contextual realities in the region enhances its validity and feasibility.
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5.5. Conclusions from the study

The adoption of CBE in Lesotho was coupled with a shift in the assessment approach, from traditional assessment methods to PA, in alignment with the stipulations of CBE (Shawa *et al.* 2023). PA is associated with a linear accumulation of data points in the assessment of the growth of the competency of students. This process of data point accumulation should be infused with multiple sessions of feedback towards the learning of the student. Literature has shown that evidence of successful implementation of PA is skewed towards high-income countries, where the development of such educational innovations in curricula is often engineered (Van der Vleuten *et al.*, 2018; Cheptoo, 2019). Unfortunately, these curriculum innovations in education do not necessarily take into consideration the specific contexts of all the countries that would adopt them. Additionally, some literature states that the instructions for PA implementation are not necessarily clearly outlined leaving low-income countries at a disadvantage to adopt this complex and resource-intensive approach to assessment. As a result, the adoption of PA by NEIs in this study posed several challenges in implementation (Cheptoo, 2019; Shawa *et al.*, 2023). Low- and middle-income countries should, therefore, reposition themselves as passive recipients of innovation or best practices generated from different foreign contexts, and drive towards investing in the development of locally contextually relevant evidence. It is important to note that educational research and associated innovation are contextual therefore local users must develop their local methods for educational innovations. The aim of the study, through the use of a robust methodology, was to develop a contextually feasible assessment approach to enhance the assessment of the attainment of competency by students in this setting.

The findings from this study revealed that knowledge of the institutional context where a curriculum innovation is to be implemented is critical in the sustainability of the implemented educational innovation. To enhance the validity of the contextual description, triangulation of the findings is necessary (Farquhar, Michels & Robson, 2020). Observational methods can be added to the self-reporting method by the implementers to avoid the Dunning-Kruger effect, which is described as the existence of cognitive bias in people with limited competencies in a particular area, where they tend to overestimate their abilities (Jansen, Rafferty & Griffiths, 2021).

Successful implementation of an educational innovation requires that all stakeholders in the NEIs be knowledgeable of it to enhance its success and sustainability. Kilbourne and colleagues (2019) agree that knowledge of the innovation and its strategies of implementation by stakeholders leads to enhanced motivation to own and sustain the innovation. Strategies to enhance knowledge of the assessment approach among the stakeholders include establishing continuing professional development (CPD) programmes towards assessment for the educators, benchmarking and collaborations with established institutions in the region. Paranjape and colleagues (2019) reiterate the importance of CPD in the incorporation of artificial intelligence in the curriculum as an innovation in health sciences education.

Institutions should develop institutional policies to guide the implementation of the assessment approach. Concurrently, national regulatory bodies such as the Nursing Council and the Council on Higher Education in Lesotho should develop standards and guidelines for the implementation of educational innovations. In addition, governments should aim to offer financial support to NEIs towards the development and implementation of educational and assessment innovations, as contextually relevant literature can inform education innovations in low-income countries.

5.6. Contribution of the study

The outcomes of the three phases of this study made a significant contribution to the advancement of knowledge and research in CBNE and assessment for low-income countries. This study contributes to knowledge through the provision of a developed feasible assessment approach that can be utilised for assessment within a CBE curriculum in a low-income country. The assessment approach is new and has not previously been designed in a similar setting. The development of the assessment approach was guided by literature from a mapping review and contributions, through semi-structured interviews, from educators who work in NEIs in the particular low-income country. The semi-structured interviews unearthed contextual issues in NEIs in a low-income country. A panel of assessment experts validated the developed assessment approach. The findings from the mapping review and semi-structured interviews have been submitted for publication in peer-reviewed journals, while the modified e-Delphi study awaited submission at the time of submission of this thesis. The rigorous scientific methods that were utilised in the development of the assessment approach are transferable to other contexts in the development of contextually feasible assessment approaches. The DSR design, which has its origins in Information Technology for the development of artefacts, was

utilised as an overarching methodology for this study. Therefore, this study enhanced the understanding of the DSR methodology out of its original domain.

5.7. Recommendations

Based on the findings of the study, the following recommendations are made to stakeholders in nursing education regarding the development and implementation of feasible assessment approaches in a low-income country.

Recommendation 1: The nursing profession

National regulatory bodies such as the Council on Higher Education and the Nurses' Council should support and collaborate with NEIs in the development of national policies that guide and enhance the fidelity of implementing the assessment approach.

Recommendation 2: Nursing Education Institutions

The development and implementation of an assessment approach in CBE requires competent educators. Therefore, NEIs should ensure the establishment of faculty development strategies towards assessment in CBE, as well as institutional policies to enhance the implementation capabilities of educators. The adoption of educational innovations, like an assessment approach, should contribute to the body of knowledge. Therefore, NEIs should encourage educators to engage in research activities through research development workshops. The NEIs should engage in benchmarking activities with neighbouring institutions in the region, where CBE has been adopted, in order to learn from their assessment implementation strategies. The outsourcing of assessment experts who can train educators in the NEIs on assessment implementation can enhance understanding, and therefore prepare them for the implementation of the new approach.

Recommendation 3: Nurse educators

Educators in the NEIs should have an understanding of the assessment approach to enable them to fully participate fully in its implementation. Strategies should be put in place to ensure that educators consistently engage in continuing professional development activities that enhance their capabilities as they execute their roles in assessment. Educators should be responsible for their own development and search for free MOOCs on assessment in CBE.

Recommendation 4: Future research

Individual NEIs are advised to conduct case study investigations after implementing the assessment approach, to outline the successes and challenges they faced, as this would guide any modifications needed to improve the quality of the approach. The results of the study have revealed a significant number of positive Dunning Kruger self-reports. Therefore, future research can aim to explore how NEIs implement assessment using an ethnographic perspective.

5.8. Limitations

The researcher identified three main limitations to the study, namely the use of the DSR methodology, the exclusion of studies published in non-English languages and the fact that descriptions of the institutional contexts at the NEIs in the semi-structured interviews were self-reported. The limitations of this study were methodological and theoretical in nature.

The search string utilised in the mapping review phase excluded studies published in languages other than English. The outcome of the mapping review and the developed assessment approach, therefore, had a bias towards the English-speaking populations. Panellists who were recruited for the Delphi process were also from English-speaking countries, which eliminated contributions from the expertise of non-English speaking assessment experts. However, the recruitment of a panel of assessment experts in the Delphi process who were from a region and contexts similar to that of the NEIs, strengthened the validity of the developed assessment approach. It is important to note that the availability of the design and development processes in the assessment approach, enable transferability of the approach to other settings, particularly in low-income settings where curriculum reforms are underway. Self-reporting of the institutional contexts by the educators could have been mitigated if the researcher had taken an observational approach, which would have had a bearing on the methods used for the study.

The words theory, model and framework that were used in the search string for the mapping review could have led to the missing of some literature that used synonyms like a set of principles.

5.9. Personal reflection

During the study, I had the privilege of acquiring a better understanding of curriculum reforms and PA. Working with educators from this particular country who showed dedication and willingness to amend their assessment approach, made me appreciate that sometimes

underperformance is not merely due to incompetence but rather the result of a lack of resources. In addition, my skills in conducting research have been enhanced.

5.10. Conclusion

This concluding chapter presented an overview of the study. The research objectives and key findings under each objective, the overall conclusions, recommendations, the contribution of the study contribution, and its limitations were described. The chapter concluded with a personal reflection by the researcher.

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ADDENDUM A
**INFORMATION LEAFLET AND CONSENT FORM TO PARTICIPATE IN
THE STRUCTURED INTERVIEWS**

TITLE OF THE RESEARCH PROJECT: AN ASSESSMENT APPROACH FOR
COMPETENCY-BASED NURSING EDUCATION IN A LOW-INCOME COUNTRY

REFERENCE NUMBER: UFS-HSD2022/0510

PRINCIPAL INVESTIGATOR: MRS. EVA MUKURUNGE

ADDRESS: Paray School of Nursing

P.O. Box 2

Thaba Tseka 550

Lesotho

EMAIL ADDRESS: evamukurunge@gmail.com

Dear Colleague

My name is Eva Mukurunge and I am a Ph.D. candidate at the University of Free State, Bloemfontein, South Africa. I would like to invite you to participate in a research project that aims to develop an assessment approach for competency-based nursing education in a low-income country.

The information in this leaflet gives an overview of the study. You can contact me if you require further explanation or clarification of any aspect of the study. Your participation is **entirely voluntary** and you are free to decline to participate. If you decline to participate, you will not be affected negatively in any way. You are also free to withdraw from the study at any point, even after agreeing to participate.

Curriculum reforms toward competency-based nursing education are associated with the adoption of assessment approaches that are resource-intensive like the programmatic assessment approach. As a result, nursing institutions in low-income countries tend to revert to the traditional methods of assessment which are not aligned with the measurement of

attainment of competency in students. Therefore, this study seeks to develop an assessment approach for competency-based nursing education in a low-income country. The developed assessment approach will, to some extent, solve the problem of the inability of nursing education institutions in low-income countries to adopt resource-intensive assessment approaches that are not feasible in their context by improving the measurement of competency attainment by students.

This study will be conducted in three phases as follows:

- Phase 1: Describe the characteristics of the different assessment approaches in undergraduate Health Professions Education through a mapping review.
- Phase 2: Describe assessment practices at selected nursing education institutions which implemented a competency-based curriculum in Lesotho.
- Phase 3: Develop, critique, refine and validate an assessment approach for competency-based nursing education for a low-income country.

By agreeing to participate in this study, you will become one of the two key faculty members in your institution who will participate in the semi-structured interviews in phase 2 of this study. The semi-structured interview aims to understand the assessment at your institution regarding three main areas: the organisation, human resources, and technology.

The interviews will be held electronically via a convenient video conference platform at a convenient time for both you and the interviewer. The duration of the interviews is estimated to be at most one hour. Three people will participate in the interview. These three will be yourself, one other faculty member from your institution and the interviewer. The interviews will be recorded and the recordings will be kept in a password-protected file in a cloud system. This study will be conducted according to accepted and applicable national and international ethical guidelines and principles. These ethical principles include confidentiality where in the interview there will be the use of codes instead of real names; the gathered information from the interviews will be kept in a password-protected file in a cloud format. Access to this information will be limited to the student and the two supervisors.

There are no anticipated risks the study may cause you, except for the time it will take you to participate in the interview. Your benefit from participating in this study is that it provides you with a platform to contribute to improving assessment in nursing education in low-income countries. You may withdraw at any time during the process without incurring any repercussions.

Kindly note that there will be no remuneration for participating in the interview. The developed assessment approach will be disseminated in peer-reviewed open-access journals and relevant conference proceedings.

This study will be conducted after full approval by the Health Sciences Research Ethics Committee of the University of the Free. For more information and clarification regarding this study and your role, you are welcome to contact the Health Sciences Research Ethics Committee of the University of the Free State (ethicsfhs@ufs.ac.za), or my supervisors, Prof. Champion Nyoni (NyoniC@ufs.ac.za) and Dr. L. Hugo-Van Dyk (HugoL1@ufs.ac.za)

If you are willing to participate in this study, please proceed to fill in the section below. Please tick (✓) to confirm your understanding of the study and willingness to participate in the section below.

1. I confirm that I have read and understood the information provided about the study. ☐
2. I agree to take part in the study. ☐

Thank you very much for your willingness to participate, your time and efforts are much appreciated.

Yours faithfully

Eva Mukurunge

(Principal Investigator)

Email address: evamukurunge@gmail.com

ADDENDUM B
LETTER TO THE GATEKEEPER

Paray School of Nursing
P.O. Box 2
Thaba Tseka 550
Lesotho

15 December 2022

The Director
National Health Training College
P.O. Box 14046
Maseru 100
Lesotho

Dear Sir/Madam

RE: PERMISSION TO CONDUCT A RESEARCH STUDY IN YOUR INSTITUTION

My name is Eva Mukurunge and I am currently working on a research project for my Ph.D. studies at the University of the Free State (UFS) in South Africa. My study is titled “**An assessment approach for a competency-based nursing programme in a low-income country**”. The study seeks to develop an assessment approach for competency-based nursing education in a low-income country. The developed assessment approach will guide assessment implementation in competency-based nursing education in a low-income country.

This study will be conducted in three phases as follows:

- Phase 1: Describe the characteristics of the different assessment approaches in undergraduate Health Professions Education through a mapping review.
- Phase 2: Describe assessment practices at selected nursing education institutions which implemented a competency-based curriculum in Lesotho.
- Phase 3: Develop, critique, refine and validate an assessment approach for competency-based nursing education for a low-income country.

Upon full approval by the Health Sciences Research Ethics Committee of the University of the Free State, this research project will use a semi-structured interview to gather information on assessment approaches in the nursing curriculum used in your institution. The interviews will also collect data about the organisation, human resources, infrastructure, and possibilities for change in your institution.

I am writing to ask your permission to access two members of your faculty with whom a semi-structured interview will be conducted. The two members of staff should know of assessment in terms of the following:

- Assessment approaches and practices utilised in the institution.
- Characteristics of the human resources in the institution in terms of their roles and their capabilities
- The organisational structure, culture, processes, and strategies
- The technology used in the institution in terms of infrastructure, development, and capabilities.

The interview should take a maximum of an hour and can be conducted at a mutually convenient time and date. All answers and results from the research will be kept strictly confidential. The results of the data gathered from the interview will be reported in a research paper available to all participants on completion.

If this is possible, could you please e-mail me at evamukurunge@gmail.com to confirm that you are willing to allow access to your faculty if they are willing to participate in the study? You are also welcome to contact the Health Sciences Research Ethics Committee of the University of the Free State (ethicsfhs@ufs.ac.za) or my supervisors, Prof. Champion Nyoni (NyoniC@ufs.ac.za) and Dr. L. Hugo-Van Dyk (HugoL1@ufs.ac.za)

In the section below can you please tick (✓) to confirm your understanding of the study and that you will avail two key faculty members from your members of staff in the nursing department to take part in the study.

1. I confirm that I have read and understood the information provided for the above study. ☐
2. I understand that any personal information collected during the study will be anonymous and remain confidential. ☐
3. I agree for our staff to take part in the study. ☐

Name of Gatekeeper

Date

Signature

.....

.....

.....

Thank you for your time and I hope to hear from you soon.

Yours faithfully

Eva Mukurunge

Student number: (2015078070)

ADDENDUM C
**INFORMATION LEAFLET AND CONSENT TO PARTICIPATE IN THE
MODIFIED E-DELPHI TECHNIQUE**

TITLE OF THE RESEARCH PROJECT: AN ASSESSMENT APPROACH FOR
COMPETENCY-BASED NURSING EDUCATION IN A LOW-INCOME COUNTRY

REFERENCE NUMBER: UFS-HSD2022/0510

PRINCIPAL INVESTIGATOR: MRS. EVA MUKURUNGE

ADDRESS: Paray School of Nursing
P.O. Box 2
Thaba Tseka 550
Lesotho

E-MAIL ADDRESS: evamukurunge@gmail.com

Dear Colleague

My name is Eva Mukurunge and I am a Ph.D. candidate at the University of Free State, Bloemfontein, South Africa. I would like to invite you to participate in a research project that aims to develop an assessment approach for competency-based nursing education in a low-income country.

The information in this leaflet outlines the details of this project. You can contact me if you require further explanation or clarification of any aspect of the study. Your participation is **entirely voluntary** and you are free to decline to participate. If you decline to participate, you will not be affected negatively in any way. You are also free to withdraw from the study at any point, even after you have agreed to take part.

This study has been approved by the **Health Sciences Research Ethics Committee (HSREC) at the University of the Free State** and will be conducted according to accepted and applicable National and International ethical guidelines and principles.

Curriculum reforms toward competency-based nursing education are associated with the adoption of assessment approaches that are resource-intensive like the programmatic assessment approach. As a result, nursing institutions in low-income countries tend to revert to the traditional methods of assessment which are not aligned with the measurement of attainment of competency in students. Therefore, this study seeks to develop an appropriate assessment approach for competency-based nursing education for a low-income country. The developed assessment approach will, to some extent, solve the problem of the inability of competency-based nursing education institutions in low-income countries to adopt resource-intensive assessment approaches that are not feasible in their context. The developed assessment approach, to some extent, may lead to the improvement in the measurement of competency attainment by nursing students.

By agreeing to participate in this study, you will become part of a modified e-Delphi review panel. An e-Delphi technique means that the data collection process will be done through electronic mailings. You will receive through your e-mail the developed assessment approach and a checklist tool. The assessment approach was developed using data gathered from a mapping review and semi-structured interviews conducted with key individual informants from faculty members at four nursing education institutions in a low-income country. You will be expected to comment, suggest and add your opinions regarding the inclusion and exclusion of words or statements presented in the assessment approach.

The process will continue through a series of scoring rounds of the modified e-Delphi technique until the panel members reach a 70% agreement on the developed assessment approach. Related documents and feedback forms will be sent to your e-mail and are expected to be completed and mailed back at the agreed dates. You will be given two weeks in each scoring round in which you will be expected to comment, suggest and add your opinions and receive feedback from the researcher. During each round, you are expected to score each statement in the assessment approach using “Yes” or “No” responses based on the perceived importance of assessment in competency-based nursing education. If you select a “No” response you are to give reasons for selecting it. Justifications in the form of narrative statements will be required

to support every decision you make. A minimum of two rounds are foreseen but it may take more rounds to achieve 70% consensus on the content of the assessment approach.

There are no anticipated risks the study may cause you, except for the time it will take you to participate in the modified e-Delphi process. It is also important that you reply by confirming your voluntary decision to participate in the study. Consenting to participate in the study implies that you commit to participating throughout the process and in all the e-Delphi rounds until you are notified that the process has ended. Your benefit from participating in this study is that it provides you with a platform to contribute to improving assessment in nursing education in low-income countries. You may withdraw at any time during the process without incurring any repercussions.

Kindly note that there will be no remuneration for participating in this modified e-Delphi research study. The developed assessment approach will be disseminated in peer-reviewed open-access journals and relevant conference proceedings.

This study was approved by the Health Sciences Research Ethics Committee of the University of the Free, number UFS-HSD2022/150. For more information and clarification regarding this study and your role, you are welcome to contact the Health Sciences Research Ethics Committee of the University of the Free State (ethicsfhs@ufs.ac.za), or my supervisors, Prof. Champion Nyoni (NyoniC@ufs.ac.za) and Dr. L. Hugo-Van Dyk (HugoL1@ufs.ac.za)

Thank you very much for your willingness to participate, your time and efforts are much appreciated.

If you are willing to participate in this study, please proceed to fill in the section below.

Please tick (✓) to confirm your understanding of the study and willingness to participate in the section.

1. I confirm that I have read and understood the information provided about the study. ☐

2. I agree to take part in the study. ☐

Yours faithfully

Eva Mukurunge

Principal Investigator

Contact details: evamukurunge@gmail.com

ADDENDUM D
DATA EXTRACTION TOOL FOR THE MAPPING REVIEW

Record number	Article title	Author	Year of publication	Country where study was conducted	Aim/purpose of the study	Study sampling	Study population (e.g., Nursing students, sample size)	Study design	Data collection	Data analysis	Models	Frameworks	Instruments	Methods	Theories	Validation criteria	Assessment approach

ADDENDUM E
INTERVIEW GUIDE FOR THE SEMI-STRUCTURED INTERVIEWS

1. Can you please describe the type of curriculum that you are using in your institution?
2. Can you comment on constructivism, constructive alignment, authenticity and scaffolding in implementing assessment in your institution?
3. Do you have any guidelines about how many assessments per semester in theory and in practice?
5. Do you have any documents that guide assessment?
6. What role do nurse educators play in assessment?
7. What are their capabilities in terms of conducting assessments or meeting the assessment expectations of competence-based education?
8. For capacity development programs, do you use local expertise or do you outsource external expertise in terms of capacitation programs?
9. How do you monitor the implementation of assessments?
10. Can you please describe the organogram of your institution and how it affects the implementation processes of assessment?
11. What technological infrastructure do you have available to support assessment for both theory and practical?
12. What developmental capacity do you have with regard use of technology in assessment?
13. What capacity do you have to further develop the available technological infrastructure?
14. To what extent are you using evidence-based processes to guide your assessment?
15. Are you engaged in research activities to generate evidence in terms of the implementation of the current assessment approach?
16. Do the nurse educators have the capability to carry out research?
17. What is the research agenda of the institution? Do you have any specific research agenda with regard to the implementation of assessment in competency-based education?
18. How do you ensure issues of validity, reliability and feasibility of the assessments that you administer?

ADDENDUM F
PERMISSION TO CARRY OUT STUDY AT PARAY SON



PARAY SCHOOL OF NURSING

P.O. Box 2
Thaba-Tseka 550
Lesotho, Southern Africa
Tell: +266 22900319/66102264
Email: info@parayson.ac.ls
Web site: www.parayson.ac.ls

16 December 2022

122 Drayton
Bretton South
Peterborough
PE39XW
United Kingdom

Dear Eva Mukurunge,

RE: APPROVAL TO CONDUCT A STUDY AT PARAY SCHOOL OF NURSING

Thank you for submitting a request to conduct a study entitled "An assessment approach for competency-based nursing education in a low-income country" at Paray School of Nursing.

The institution's Research Committee reviewed your research proposal and all the accompanying documents and were satisfied to grant you the permission to conduct the study. Therefore, your request has been **APPROVED** and permission **GRANTED** for you to conduct the study at Paray School of Nursing. We anticipate that you will adhere to all the processes as outlined in your research proposal.

Thank you for considering Paray School of Nursing as one of the institutions where you will conduct your study. Looking forward to your sharing the final report.

Yours Sincerely

Dr. M. Shawa

Research Committee Chairperson

ADDENDUM G
PERMISSION TO CARRY OUT STUDY AT SCOTT CON



Private Bag
Moriija 190
Lesotho

Tel: (00266) 22360011
52500111
Email: info@scottcon.ac.ls
scottnursingschl@gmail.com
Website: www.scottcon.ac.ls

31.05.2023

Eva Mokurunge
University of Free State
Dear Madam,

Ministry of Health ethics approval number: (ID-206-2022)
University of Free State

Approval to collect data at Scott College of Nursing

The College Management received your letter requesting to collect data through interviews with nurse educators at Scott College of Nursing. The title '*An assessment Approach to Competency-Based Education in Low-income Country*' has been noted.

The Management is pleased to inform you that your request has been approved and you can start data collection on the proposed date. When conducting the study please maintain all ethical principles that guide research and at the end you are required to submit a report on the findings of the study to the Deputy Principal Nurse Educator (DPNE). The participants are ready for interviews. You will be provided with the direct contacts so as to make arrangements on the requested date.

Best wishes in your studies.

Yours faithfully,


Mateboho Khoanyane Leohla
Deputy Principal Nurse Educator
Scott College of Nursing

ADDENDUM H
PERMISSION TO CARRY OUT THE STUDY AT MALUTI ADVENTIST COLLEGE



MALUTI ADVENTIST COLLEGE

Private Bag X019
Ficksburg, 9730
South Africa

Tel: +266 2254 0203/11
Fax: +266 2254 0230
Email: malutison@gmail.com

P.O. Box 11
Mapoteng, 250
Lesotho

12/01/2023

Dear Eva Mukurunge

RE: An assessment approach for competency-based nursing education in low-income country

In its sitting, the Maluti Adventist College Research and Ethics Committee reviewed your application to conduct your study among the faculty and APPROVED the above named protocol and hereby authorizes you to conduct such a study according to the activities and population specified in the protocol. Kindly make correction of the institution's name; Maluti Adventist College of Nursing as depicted in your application documents to Maluti Adventist College (MAC). Departure from the approved protocol will constitute a breach of this permission.

This approval is informed by the following documents attached to this application:

- [x] ADDENDUM D: letter to the gatekeeper
- [x] ADDENDUM F: Information leaflet and consent form to participate in the structured interviews
- [x] Curriculum vitae
- [x] UFS.UV Conditional ethical clearance
- [x] MAC cover letter
- [x] Study protocol

ADDENDUM I
PERMISSION TO CARRY OUT THE STUDY AT ROMA CON



Roma College of Nursing

P.O. Box 26, Roma 180
Lesotho
Tel: +266 28340486
Cell: +266 59400444

Email: info@rcn.org.ls
Website: www.rcn.org.ls

15th May, 2023

Mrs. Eva Mukurunge

Dear Madam,

**RE: REQUEST FOR PERMISSION TO COLLECT DATA FROM ROMA COLLEGE OF
NURSING FOR THE PROPOSED RESEARCH STUDY**

The Roma College of Nursing Management received your request from the respective Institutional Committee with regard to the above referenced matter as part your doctoral studies. The research proposal was noted as "Assessment of and for learning in institutions that were supported by the NEPI/MEPI."

I am pleased to inform you that your request has been approved following submission of the requested documents and you are to indicate all the logistics required prior the interviews so that timely preparations could be made.

Sincerely,

M.L. Keketsi-Mokotso (Mrs.)

ADDENDUM J

ETHICS APPROVAL FROM UFS HSREC



Health Sciences Research Ethics Committee

09-Jun-2023

Dear Mrs Eva Mukurunge

Ethics Clearance: **An assessment approach for competency-based nursing education in a low-income country**

Principal Investigator: **Mrs Eva Mukurunge**

Department: **School of Nursing Department (UFS Main Campus)**

[Submission Page](#)

APPLICATION APPROVED

Please ensure that you read the whole document

With reference to your application for ethical clearance with the Faculty of Health Sciences, I am pleased to inform you on behalf of the Health Sciences Research Ethics Committee that you have been granted ethical clearance for your project.

Your ethical clearance number, to be used in all correspondence is: **UFS-HSD2022/0510/2006**

The ethical clearance number is valid for research conducted for one year from issuance. Should you require more time to complete this research, please apply for an extension.

We can approve this study for the following sites in Lesotho:

- National Health Training Centre
- Malute Adventist College of Nursing
- National University of Lesotho
- Paray School of Nursing
- Roma College of Nursing
- Scott College of Nursing

We request that any changes that may take place during the course of your research project be submitted to the HSREC for approval to ensure we are kept up to date with your progress and any ethical implications that may arise. This includes any serious adverse events and/or termination of the study.

A progress report should be submitted within one year of approval, and annually for long term studies. A final report should be submitted at the completion of the study.

Research conducted in any Department of Health facility: Researchers are required to sign and return the HSREC approval letters to the provincial Department of Health where they applied. It is also a requirement for researchers to submit electronic copies of their final research findings, and/or make a presentation of their findings and recommendations at departmental research days when and where indicated.

The HSREC functions in compliance with, but not limited to, the following documents and guidelines: The SA National Health Act No. 61 of 2003; Ethics in Health Research: Principles, Structures and Processes (2015); SA GCP(2020); Declaration of Helsinki; The Belmont Report; The US Office of Human Research Protections 45 CFR 461 (for non-exempt research with human participants conducted or supported by the US Department of Health and Human Services- (HHS), 21 CFR 50, 21 CFR 56, CIOMS, ICH-GCP-E6 Sections 1-4; International Council for Harmonisation (ICH) Harmonised Guideline, Integrated Addendum to ICH E6(R1), Guideline for Good Clinical Practice (GCP) E6(R2), 2016, SAHIPRA Guidelines as well as Laws and Regulations with regard to the Control of Medicines, Constitution of the HSREC of the Faculty of Health Sciences.

The Principal Investigator (PI) bears final responsibility for the RIMS application. In the event of any misconduct or improper activities perpetrated by a third party, the PI will be held vicariously liable. The HSREC will bear no responsibility or liability for any actions of a PI and/or third party or breach of confidentiality caused by the PI and/or third party.

For any questions or concerns, please feel free to contact HSREC Administration: 051-4017794/5 or email EthicsFHS@ufs.ac.za.

Thank you for submitting this proposal for ethical clearance and we wish you every success with your research.

Yours Sincerely

ADDENDUM K

ETHICS APPROVAL FROM THE MINISTRY OF HEALTH, LESOTHO



LESOTHO

Ministry of Health
P.O. Box 514
Maseru 100

REF: ID08-2023
Date: March 12, 2023
To
Eva Mukurunge,
School of Nursing
University of the Free State

Category of Review:
☒ Initial Review
☐ Continuing Annual Review
☐ Amendment/Modification
☐ Reactivation
☐ Serious Adverse Event
☐ Other _____

Dear Mukurunge,

RE: An Assessment Approach for Competency-Based Nursing Education in Low-income Country

This is to inform you that the Ministry of Health Research and Ethics Committee reviewed and **APPROVED** the above named protocol and hereby authorizes you to conduct the study according to the activities and population specified in the protocol. Departure from the approved protocol will constitute a breach of this permission.

This approval includes review of the following attachments:

- ☒ Protocol
- ☒ Informed Consent form: Consent Form
- ☒ **Data Collection Tool:** Draft Data Collection Tool for the Structured Interviews
- ☒ Participant materials: *Information Leaflet*
- ☒ Other materials: Letter of permission to conduct a study dated 15th December 2022, Letter of support from Head of the Department University of Free State and CV_ Eva Mukurunge

This approval is **VALID** until March 12, 2024.

Please note that an annual report and request for renewal, if applicable, must be submitted at least 6 weeks before the expiry date.

All serious adverse events associated with this study must be reported promptly to the MOH Research and Ethics Committee. Any modifications to the approved protocol or consent forms must be submitted to the committee prior to implementation of any changes. We look forward to receiving your progress reports and a final report at the end of the study. If you have any questions, please contact the Research and Ethics Committee at mohrcu@gmail.com (or) 59037919/58800246.

Sincerely,

DR. NYANE LETSIE
Director General Health Services

MRS. VERONICA LEHANA
Co-Chairperson National Health Institutional
Review Board (NH-IRB)

ADDENDUM L

AUTHOR GUIDELINES FOR BMC MEDICAL EDUCATION

Research article

Criteria

Research articles should report on original primary research, but may report on systematic reviews of published research provided they adhere to the appropriate reporting guidelines which are detailed in our [editorial policies](#). Please note that non-commissioned pooled analyses of selected published research will not be considered. Studies reporting descriptive results from a single institution or region will only be considered if analogous data have not been previously published in a peer reviewed journal and the conclusions provide distinct insights that are of relevance to a regional or international audience.

BMC Medical Education strongly encourages that all datasets on which the conclusions of the paper rely should be available to readers. We encourage authors to ensure that their datasets are either deposited in publicly available repositories (where available and appropriate) or presented in the main manuscript or additional supporting files whenever possible. Please see Springer Nature's [data repository guidance](#).

Authors who need help depositing and curating data may wish to consider contacting our [Research Data Support Helpdesk](#).

Professionally produced Visual Abstracts

BMC Medical Education will consider visual abstracts. As an author submitting to the journal, you may wish to make use of services provided at Springer Nature for high quality and affordable visual abstracts where you are entitled to a 20% discount. Click [here](#) to find out more about the service, and your discount will be automatically be applied when using this link.

Preparing your manuscript

The information below details the section headings that you should include in your manuscript and what information should be within each section.

Please note that your manuscript must include a 'Declarations' section including all of the subheadings (please see below for more information).

Title page

The title page should:

- present a title that includes, if appropriate, the study design e.g.:
 - "A versus B in the treatment of C: a randomized controlled trial", "X is a risk factor for Y: a case control study", "What is the impact of factor X on subject Y: A systematic review"
 - or for non-clinical or non-research studies a description of what the article reports

list the full names and institutional addresses for all authors

- if a collaboration group should be listed as an author, please list the Group name as an author. If you would like the names of the individual members of the Group to be searchable through their individual PubMed records, please include this information in the “Acknowledgements” section in accordance with the instructions below
- Large Language Models (LLMs), such as ChatGPT, do not currently satisfy our authorship criteria. Notably an attribution of authorship carries with it accountability for the work, which cannot be effectively applied to LLMs. Use of an LLM should be properly documented in the Methods section (and if a Methods section is not available, in a suitable alternative part) of the manuscript.
- indicate the corresponding author

Abstract

The Abstract should not exceed 350 words. Please minimize the use of abbreviations and do not cite references in the abstract. Reports of randomized controlled trials should follow the CONSORT extension for abstracts. The abstract must include the following separate sections:

- **Background:** the context and purpose of the study

Methods: how the study was performed and statistical tests used

Results: the main findings

Conclusions: brief summary and potential implications

Trial registration: If your article reports the results of a health care intervention on human participants, it must be registered in an appropriate registry and the registration number and date of registration should be stated in this section. If it was not registered prospectively (before enrollment of the first participant), you should include the words 'retrospectively registered'. See our editorial policies for more information on trial registration

Keywords

Three to ten keywords representing the main content of the article.

Background

The Background section should explain the background to the study, its aims, a summary of the existing literature and why this study was necessary or its contribution to the field.

Methods

The methods section should include:

- the aim, design and setting of the study
- the characteristics of participants or description of materials
- a clear description of all processes, interventions and comparisons. Generic drug names should generally be used. When proprietary brands are used in research, include the brand names in parentheses

- the type of statistical analysis used, including a power calculation if appropriate

Results

This should include the findings of the study including, if appropriate, results of statistical analysis which must be included either in the text or as tables and figures.

Discussion

This section should discuss the implications of the findings in context of existing research and highlight limitations of the study.

Conclusions

This should state clearly the main conclusions and provide an explanation of the importance and relevance of the study reported.

List of abbreviations

If abbreviations are used in the text they should be defined in the text at first use, and a list of abbreviations should be provided.

Declarations

All manuscripts must contain the following sections under the heading 'Declarations':

- Ethics approval and consent to participate
- Consent for publication
- Availability of data and materials
- Competing interests
- Funding
- Authors' contributions
- Acknowledgements
- Authors' information (optional)

Please see below for details on the information to be included in these sections.

If any of the sections are not relevant to your manuscript, please include the heading and write 'Not applicable' for that section.

Ethics approval and consent to participate

Manuscripts reporting studies involving human participants, human data or human tissue must:

- include a statement on ethics approval and consent (even where the need for approval was waived)
- include the name of the ethics committee that approved the study and the committee's reference number if appropriate

Studies involving animals must include a statement on ethics approval and for experimental studies involving client-owned animals, authors must also include a statement on informed consent from the client or owner.

See our [editorial policies](#) for more information.

If your manuscript does not report on or involve the use of any animal or human data or tissue, please state “Not applicable” in this section.

Consent for publication

If your manuscript contains any individual person’s data in any form (including any individual details, images or videos), consent for publication must be obtained from that person, or in the case of children, their parent or legal guardian. All presentations of case reports must have consent for publication.

You can use your institutional consent form or our [consent form](#) if you prefer. You should not send the form to us on submission, but we may request to see a copy at any stage (including after publication).

See our [editorial policies](#) for more information on consent for publication.

If your manuscript does not contain data from any individual person, please state “Not applicable” in this section.

ADDENDUM M

AUTHOR GUIDELINES FOR ASSESSMENT AND EVALUATION IN HIGHER EDUCATION

Preparing Your Paper

Article Types

Research Article

- Should be written with the following elements in the following order: title page; abstract; keywords; main text introduction, materials and methods, results, discussion; acknowledgments; declaration of interest statement; references; appendices (as appropriate); table(s) with caption(s) (on individual pages); figures; figure captions (as a list)
- Should be no more than 7000 words, inclusive of:
 - Tables
 - References
 - Figure or table captions
 - Footnotes
 - Endnotes
- Should contain an unstructured abstract of 200 words.
- Should contain between 3 and 4 **keywords**. Read [making your article more discoverable](#), including information on choosing a title and search engine optimization.

Anonymisation

An anonymous version of your paper is required when submitting. See [Anonymisation Checklist](#)

- [Title](#)
- [Author information](#)
- All author names, including first and last name
- All up-to-date author email addresses
- All author affiliations and countries
- Corresponding author indicator
- [ORCiDs](#)/ social media handles (optional)

[Abstract](#)

200 words

3-4 [Keywords](#)

Main text

Declarations and ethics statements

[Ethical approval](#)(if applicable)

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ADDENDUM N

AUTHOR GUIDELINES FOR NURSE EDUCATION IN PRACTICE

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ADDENDUM O
GOOGLE FORM USED IN THE DELPHI

An assessment approach for competency-based nursing education in a low-income country

This assessment approach has six domains that should be engaged with to ensure the validity and feasibility of implementing assessment in competency-based education. Please refer to the email attachment for more details on the assessment approach. We kindly ask that you go through the Google form and give your input on the relevance of each of the sub-sections to the development of the assessment approach.

* Indicates required question

Skip to question 6

Domain 1: Curriculum, academic planning and moderation

Domain 1 entails the curriculum, academic planning and moderation. You are to decide if the domain is correctly structured and has been correctly applied in all of the macro-, meso- and micro levels of the model. In domain 1 the micro level has 3 sections; the meso level has 8 sections and the macro level has 2 sections

1. Is domain 1 correctly structured: Curriculum, academic planning and moderation *

Mark only one oval.

☐ Yes *Skip to section 5 (Micro level for Domain 1)*

☐

No *Skip to question 2*

Give reasons for selecting No*

Micro level for Domain 1

The micro-level entails the implementation of assessment on a day-to-day basis in the classroom and clinical area. Domain 1 has three sub-sections at the micro-level. Comment on whether they are correctly placed in the model

Sub-section 1.1.1: Educators as Moderators

Educators will be involved in moderating all assessments before they are administered to students to enhance alignment of learning outcomes, teaching and learning activities and assessment.

3. Is the sub-section relevant

*

Mark only one oval.

☐ Yes *Skip to question 5*

☐ No *Skip to question 4*

Give reasons for selecting No*

Sub-section 1.1.2: Educators as Assessors,

Educators will be expected to set the assessments in alignment with the learning outcomes, and teaching and learning outcomes

5. Is the sub-section relevant

*

Mark only one oval.

☐ Yes *Skip to question 7*

☐ No *Skip to question 6*

Give reasons for selecting No*

Sub-section 1.1.3: Educators as Trainers

Senior educators with expertise in assessment will be involved in running training workshops in assessment for all educators to keep their assessment skills up-to-date

7. Is the sub-section correct *

Mark only one oval.

- ☐ Yes *Skip to section 12 (The Meso level*
☐ *for Domain 1) No Skip to question 8*

Give reasons for selecting No*

The Meso level for Domain 1

At the meso-level, assessment implementation is monitored at the organizational level. This involves the key offices for decision-making that appear in the organogram of the institution like the Quality Assurance office and Academic Head. At the meso-level Domain 1 has 8 sub-sections. Comment on whether they are relevant in the model

Sub-section 1.2.1: Yearly master plan reflecting assessment schedule per module

The Academic Committee and the heads of departments should develop a master plan that maps the academic activities including assessments at the beginning of the academic year to ensure the flow of assessment activities.

9. Is sub-section 1.2.1 correct and relevant

** Mark only one oval.*

- ☐ Yes *Skip to question 11*
☐ No *Skip to question 10*

Give reasons for selecting No

10. *

Sub-section 1.2.2 Moderation of all assessments

This statement implies that there is no assessment that should be administered to students without moderation. Therefore, the persons responsible for monitoring academic activities including assessments should be vigilant and come up with structures for monitoring and enforcing moderation activities.

11. Is sub-section 1.2.2 correct and relevant

*

Mark only one oval.

☐ Yes Skip to question 13

☐ No Skip to question 12

Give reasons for selecting No

12. *

Sub-section 1.2.3 Appropriate and cost-effective assessment method

The choice of assessment method should be appropriate for the learning outcome to be assessed according to the cost and documents that guide assessment like the curriculum, the blueprint and the assessment policy

13. Is sub-section 1.2.3 appropriate?

*

Mark only one oval.

☐ Yes Skip to question 15

☐ No Skip to question 14

Give reasons for selecting No

14. *

Sub-section 1.2.4: Competency-based curriculum

The competency-based curriculum is learner-centred and is underpinned by four principles which are: constructivism; constructive alignment; scaffolding and authenticity. Therefore, when implementing assessment in the competency-based curriculum the offices responsible for monitoring academic activities should ensure that there is alignment with the principles and the stipulates of the curriculum in implementing assessments.

15. Comment on whether sub-section 1.2.4 is appropriate

*

Mark only one oval.

☐ Yes Skip to question 17

☐ No Skip to question 16

Give reasons for selecting No

16. *

1.2.5 Student-centred learning

The curriculum is student-centred meaning that the educator is there to guide the students while they construct meaning using resources in alignment with the learning outcomes in the curriculum

17. Is sub-section 1.2.5

relevant?*

Mark only one oval.

☐ Yes Skip to question 19

☐ No Skip to question 18

Give reasons for selecting No

18. *

1.2.6 Physical resources for assessment

For the implementation of assessments to be good physical resources like the classrooms, the simulation laboratory and the clinical area which include the the clinics and hospitals should be available and accessible. In order to implement blended learning and assessments, there should be computers. The offices responsible for academic issues should ensure full use of the physical resources in assessment.

19. Is sub-section 1.2.6 correct and relevant

* *Mark only one oval.*

☐ Yes *Skip to question 21*

☐ No *Skip to question 20*

Give reasons for selecting No

20. *

Sub-section 1.2.7: Infrastructure for e-assessment

In order to implement e-assessment the following should be available: computers, e-learning platforms, software and hardware for e-assessment. The management should provide the infrastructure for e-assessment

21. Is this sub-section relevant and correct

*

Mark only one oval.

☐ Yes *Skip to question 23*

☐ No *Skip to question 22*

Give reasons for selecting No

22. *

Sub-section 1.2.8: Cybersecurity related to institutional assessments.

The management of the institution should provide resources and workshops for educators to enable the implementation of cybersecurity

23. Is sub-section 1.2.8

relevant? * *Mark only*

one oval.

☐ Yes *Skip to section 29 (Macro-level for*

☐ Domain 1) NoSkip to question 24

Give reasons for selecting No

24. *

Macro-level for Domain 1

At the macro level, external stakeholders are involved in the implementation of assessments.

External stakeholders include governing bodies like the Nursing Council; the Ministry of Health; the Senate, and the Council on Higher Education. At the macro-level national decisions on assessment are made, including the registration and continuous professional development of nurses. Domain 1 has two sub-sections at the macro level. Comment on whether they are relevant in the model.

Sub-section 1.3.1: Institutional/independent assessment practice

The mandate of the Council on Higher Education states that institutions should have customised documents that guide the implementation of assessment. These documents include the assessment policy.

25. Is sub-section 1.3.1 correct and relevant

* *Mark only one oval.*

☐ Yes *Skip to question 27*

☐ No *Skip to question 26*

Give reasons for selecting No

26. *

Domain 2: Faculty capacity and development

Domain 2 is about the levels of expertise that educators possess with regard to assessment and the opportunities that are available to build and enhance their capabilities. You are to decide if the domain is correctly structured and has been correctly applied in all of the macro-, meso- and micro levels of the model. In domain 2 the micro level has 2 sub-sections; the meso level has 4 subsections and the macro level has 3 sub-sections

27. Is Domain 2 well-structured and relevant

*

Mark only one oval.

☐ Yes *Skip to question 29*

☐ No *Skip to question 28*

Give reasons for selecting No

28. *

Sub-section 2.1.2. Capacity development on evidence-based assessment and research in assessment

Educators should attend scheduled workshops on capacity building in assessment research

29. Is sub-section 2.1.2. correct and relevant?

*

Mark only one oval.

☐ Yes *Skip to section 36 (Meso level for*

☐ Domain 2) NoSkip to question 30

Give reasons for selecting No

30. *

Meso level for Domain 2

At the meso level, assessment implementation is monitored at the organizational level. This involves the key offices for decision-making that appear in the organogram of the institution like the Quality Assurance office and Academic Head. At the meso level, Domain 2 has 4 sub-sections. Comment on whether they are relevant in the model

Sub-section 2.2.1.: Educator performance appraisal

The key officers, in the institution, that are responsible for the management of academic processes, for example, the Quality Assurance officer and the Head of Academics should ensure that there are schedules for performance appraisal with assessment as a component of the process.

31. Is sub-section 2.2.1 correct and relevant?

*

Mark only one oval.

☐ Yes Skip to question 33

☐ No Skip to question 32

Give reasons for selecting No

32. *

Sub-section 2.2.2.: Educator essential assessment competencies

The Academic committee should outline essential assessment competencies that educators should possess to ensure validity and reliability in assessment.

33. Is sub-section correct and relevant *

Mark only one oval.

- ☐ Yes *Skip to question 35*
- ☐ No *Skip to question 34*

Give reasons for selecting No

34. *

2.2.3. Monitoring and maintenance of educator essential assessment competencies

The responsible officers, for example the Quality assurance officer, should keep record and ensure that educators are always up-to-date with their assessment competencies

35. Is sub-section 2.2.3. correct and relevant?

*

Mark only one oval.

- ☐ Yes *Skip to question 37*
- ☐ No *Skip to question 36*

Give reasons for selecting No

36. *

Sub-section 2.2.4.: Monitor research output in Assessment.

The responsible offices have to support and monitor assessment research output

37. Is sub-section 2.2.4 correct and relevant?

*

Mark only one oval.

- ☐ Yes *Skip to section 45 (Macro level for*
- ☐ Domain 2) NoSkip to question 38
-

Give reasons for selecting No

38. *

Macro level for Domain 2

At the macro level, external stakeholders are involved in the implementation of assessments.

External stakeholders include governing bodies like the Nursing Council; the Ministry of Health; the Senate, and the Council on Higher Education. At the macro-level national decisions on assessment are made, including the registration and continuous professional development of nurses. Domain 2 has three sub-sections at the macro level. Comment on whether they are relevant in the model.

Sub-section 2.3.1.National strategy for faculty development on Assessment

The governing bodies should develop a strategy to build uniform and relevant assessment competencies. For example, have prototype assessment workshops that are pre-recorded to be shared with the institutions so that educators can watch them and all have uniform competencies

39. Is sub-section 2.3.1. correct and relevant/

*

Mark only one oval.

☐ Yes Skip to question 39

☐ No Skip to question 40

Give reasons for selecting No

40. *

Sub-section 2.3.2.: Continuing Professional Development in Assessment

External holders like the Senate can assist educators in continually building their capacity in assessment implementation

41. Is sub-section 2.3.2. correct and relevant

*

Mark only one oval.

☐ Yes Skip to question 43

☐ No Skip to question 42

Give reasons for selecting No

42. *

Sub-section 2.3.3: National Nurse Educator Faculty Development Coordination

The external stakeholders like the governing bodies which include the Council on Higher Education and the Council of Nurses should establish an office responsible for nurse educator development. The office will be responsible for the development of essential assessment competencies and resources for implementing assessment workshops to enhance educator capabilities

43. Is sub-section 2.3.3. correct and relevant

*

Mark only one oval.

☐ Yes Skip to question 44

☐ No Skip to section 51 (Give reasons for selecting No)

Give reasons for selecting No

Domain 3: Stakeholders

In this domain, stakeholders refer to external entities in the institution but have influence over processes of assessment in the institutions. For example, the Senate oversees academic processes in the institution and the Council on Higher Education sets standards of operation that institutions of higher learning should follow. You are to decide if the domain is correctly structured and has been correctly applied in all of the macro-, meso- and micro levels of the model. In domain 3 the micro level has no sub-sections in the micro level; 2 sub-sections in the meso level and 3 sub-sections in the macro level

44. Is domain 3 correctly structured and is it relevant

*

Mark only one oval.

- ☐ Yes Skip to section 54 (Meso level)
- ☐ No Skip to question 45

Give reasons for selecting No

45. *

Meso level

At the meso level, assessment implementation is monitored at the organizational level. This involves the key offices for decision-making that appear in the organogram of the institution like the Quality Assurance office and Academic Head. At the meso level, Domain 3 has 2 sub-sections. Please make comments on whether they are relevant in the model

Sub-section 3.2.1: Involve students in assessment evaluation.

Students' input of their experience with the checklists used in the clinical area as well as their experience of the clinical examinations is necessary in the modification of checklists

46. Is sub-section 3.2.1

relevant? * Mark only

one oval.

- ☐ Yes Skip to question 48
- ☐ No Skip to question 47

Give reasons for selecting No

47. *

Sub-section 3.2.2: Internal mechanism/committees for monitoring assessment

The institution should put in place committees like the Assessment committee or the Academic committee which will be responsible for monitoring assessment implementation

48. Is sub-section 3.2.2 relevant? * *Mark only one oval.*

☐ Yes *Skip to section 59 (Macro level for*

☐ Domain 3) No *Skip to question 49*

Give reasons for selecting No

49. *

Macro level for Domain 3

At the macro level, external stakeholders are involved in the implementation of assessments.

External stakeholders include governing bodies like the Nursing Council; the Ministry of Health; the Senate, and the Council on Higher Education. At the macro-level national decisions on assessment are made, including the registration and continuous professional development of nurses. Domain 3 has three sub-sections at the macro level. Comment on whether they are relevant to the model.

Sub-section 3.3.1: Professional authorities/bodies that monitor assessment.

In order to have reliable and valid assessments in institutions professional bodies like the Nursing Council should be involved at the national level in the drafting of regulations that guide the implementation of assessment

50. Is sub-section 3.3.1

relevant? * *Mark only*

one oval.

☐ Yes *Skip to question 52*

☐ No *Skip to question 51*

Give reasons for selecting No

51. *

Sub-section 3.3.2: Clear terms of reference for organisation boards regarding institutional assessment strategy

There should be clear terms of reference for institutional boards so that their activities and decision-making processes will not be clouded by their professional or religious orientation

52. Is sub-section 3.3.2 clear and relevant?

*

Mark only one oval.

☐ Yes *Skip to question 54*

☐ No *Skip to question 53*

Give reasons for selecting No

53. *

Sub-section 3.3.3: External mechanism/committees for monitoring assessment

At the national level, there should be the establishment of Assessment committees whose mandate will be to monitor if institutional assessment committees are abiding by national assessment guidelines

54. Is sub-section 3.3.3 *

Mark only one oval.

☐ Yes *Skip to question 56*

☐ No *Skip to question 55*

Give reasons for selecting No

55. *

Domain 4: Evidence Based Practice

Domain 4 refers to institutions adopting and using guidelines and practices that have been informed by research. Institutions can also undertake research to inform their practice. Can you please decide if the domain is correctly structured and has been correctly applied in all of the macro-, meso- and micro levels of the model? In domain 4 the micro level has 1 sub-section at the micro level; 2 subsections at the meso level and 2 sub-sections at the macro level

56. Is domain 4 correct and relevant?

*

Mark only one oval.

- ☐ Yes Skip to section 68 (Micro level for
☐ Domain 4) NoSkip to question 57

Give reasons for selecting no

57. *

Micro level for Domain 4

Please comment on whether the sub-section is relevant to evidence-based practice

Subsection 4.1.1: Evidence-based assessment practices

Educators should utilise evidence-based practices to inform their implementation of assessment practices

58. Is sub-section 4.1.1

relevant? * *Mark only*

one oval.

- ☐ Yes Skip to section 71 (Meso level for
☐ Domain 4) NoSkip to question 59

Give reasons for selecting No

59. *

Meso level for Domain 4

The meso level has 2 sub-categories. Please comment on their relevance

Sub-competency 4.2.1: Periodic review of assessment practice

The institutional Quality assurance officers should have scheduled periodic reviews of all assessment practices in the institution. The reviews should include adherence to assessment guidelines and continuous professional development of the educators.

60. Is sub-section 4.2.1

relevant *

Mark only one oval.

☐ Yes Skip to question 62

☐ No Skip to question 61

Give reasons for selecting No

61. *

Sub-section 4.2.2: Adoption of innovative evidence-based assessment practices

Institutions should always be vigilant in assessment research so that they can adopt and implement feasible evidence-based assessment practices

62. Is sub-section 4.2.2

relevant *

Mark only one oval.

- ☐ Yes Skip to section 76 (Macro level for Domain 4: Evidence-based practice) No Skip to question 63

Give reasons for selecting No

63. *

Macro level for Domain 4: Evidence-based practice

The macro level has one sub-section. Please comment on its relevance

Sub-section 4.3.1.Partnership with external institutions/ bodies on research in assessment

In order to increase research output and also to increase capacity in carrying out research institutions should engage with external partners in assessment research activities.

64. Is sub-section 4.3.1

relevant *

Mark only one oval.

- ☐ Yes Skip to question 66
☐ No Skip to question 65

Give reasons for selecting No

65. *

Domain 5: Assessment Methods, Techniques, and Blueprints

In order to make assessment affordable and reliable, institutions should ensure that they select the correct assessment methods for given learning outcomes according to the blueprints. There are various assessment methods to use in theory and practice.

66. Is Domain 5 relevant?

*

Mark only one oval.

- ☐ Yes
Skip to section 81 (Meso level for Domain 5: Assessment Methods, Techniques, Blueprints
- ☐ No *Skip to question 67*

Give reasons for selecting No

67. *

Meso level for Domain 5: Assessment Methods, Techniques,
Blueprints

**The meso level has 3 sub-sections. Please comment on their
relevance.**

Sub-section 5.2.1: Blueprint of all learning outcomes

The Academic Committee and Quality Assurance office should ensure that each module in the curriculum has a blueprint which should be revised periodically according to the Assessment policy of the institution.

68. Is sub-section 5.2.1

relevant? * *Mark only*

one oval.

☐ Yes *Skip to question 70*

☐ No *Skip to question 69*

Give reasons for selecting No

69. *

Sub-section 5.2.2: Relevant and updated taxonomy for assessment

Institutions should always keep up to date with taxonomies for assessment for example use of upgraded Bloom's taxonomy

70. Is sub-section 5.2.2

relevant? * *Mark only*

one oval.

☐ Yes *Skip to question 74*

☐ No *Skip to question 71*

Give reasons for selecting No

71. *

Sub-section 5.2.3: Assessment policy aligned with the curriculum model and assessment design principles.

72. Is sub-section 5.2.3

relevant? * *Mark only*

one oval.

☐ Yes *Skip to question 74*

☐ No *Skip to question 73*

Give reasons for selecting No

73. *

Domain 6: Organisation and Finances

Domain 6 focuses on suggestions on how funding for assessment should be managed in order to improve implementation. Can you please comment on whether the domain is correctly structured and has been correctly applied in both the meso- and micro levels of the model? In domain 6 the micro level has one sub-section in the micro level; and four sub-sections in the meso level.

74. Is Domain 6: Organisation and finances relevant?

*

Mark only one oval.

- ☐ Yes *Skip to section 90 (Micro level for*
☐ domain 6) No *Skip to question 75*

Give reasons for selecting No

75. *

Micro level for domain 6

Domain 6 has one sub-section in the microlevel. Please comment on its relevance

Subsection 6.1.1Capacity development for administrative staff on budgeting for assessment

In order for institutions to operate at their optimum level all departments should be working in sinc. Therefore, the administrative staff need to receive training on budgeting for assessment

76. Is sub-section 6.1.1
relevant? * *Mark only*

one oval.

- ☐ Yes *Skip to section 93 (Meso level for
Domain 6)*

No *Skip to question 77*

Give reasons for selecting No

77. *

Meso level for Domain 6

The meso level has 4 sub-sections. Please comment on their relevance.

6.2.1.Budget for assessments

78. Is sub-section 6.2.1
relevant? * *Mark only*

one oval.

- ☐ Yes *Skip to question 80*
- ☐ No *Skip to question 79*

Give reasons for selecting No

79. *

Sub-section 6.2.2.Budget for capacity development in assessment

The administrative staff need to know the importance of educators attending workshops to build their capacities in all activities that enhance implementation of assessment. Therefore the importance of budgeting for the workshops

80. Is sub-section 6.2.2

relevant? * *Mark only*

one oval.

☐ Yes *Skip to question 82*

☐ No *Skip to question 81*

Give reasons for selecting No

81. *

Sub-section 6.2.3.Budget for technology-related infrastructure for assessment

The administrative staff need to know the importance of technology in assessment so that they will be able to budget appropriately for infrastructure like maintenance of the simulation laboratory. Therefore, it is noteworthy that the administrative staff be included in the meetings for assessment for them to appreciate the importance of technology-related infrastructure in assessment.

82. *

Mark only one oval.

☐ Yes *Skip to question 84*

☐ No *Skip to question 83*

Give reasons for selecting No

83. *

Sub-section 6.2.4: Institutional meetings and planning for assessments

The management of the institutions should prioritise meetings for planning for assessments.

84. Is sub-section 6.2.4

relevant? * *Mark only*

one oval.

☐ Yes

☐ No *Skip to question 85*

Give reasons for selecting No

ADDENDUM P
THE DEVELOPED ASSESSMENT APPROACH

**An assessment approach
for competency-based
nursing education in a
low-income country**



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CONCEPTUAL DEFINITION OF TERMS

Assessment: Assessment is the process of gathering information from various sources and activities in order to develop a deep understanding of what students know, understand, and can do with their knowledge as a result of their educational experiences (Tontus, 2020). In this study, assessment refers to the use of different assessment methods in gathering information on the competencies of students during their learning.

Assessment approach: An assessment approach is a set of theories and principles that reflect a particular model used in the implementation of assessments in an educational programme (Lockyer, Carraccio, Chan, Hart, Smee, Touchie, Holmboe, Frank & ICBME Collaborators, 2017). In this study, an assessment approach refers to the set of theories and principles used in implementing assessment in an educational programme.

Competency-based education:

Competency-based education is a pedagogical approach that is student-centred and directed at the attainment of competencies (Frank, Mungroo, Ahmad, Wang, de Rossi & Horsley, 2010; Kabanga, Mugimu, & Oonyu, 2018). Acquisition of competencies should enable the student to function independently and effectively in the provision of health care (Kabanga, Mugimu & Oonyu 2018). In this study, competency-based education will refer to a pedagogical approach that is student-centred and is focused on student attainment of competencies.

Domain:

A domain is an area of particular interest or knowledge (Cambridge University Press & Assessment, 2023). In this assessment approach, a domain refers to the focus areas that need to be addressed when implementing assessment.

Macro level:

Macro indicates that something relates to a larger general area rather than being detailed and specific (Collins Dictionary 2023). In the artefact, the macro level refers to a national level of decision-making for example, the Council on Higher Education makes decisions on how institutions of education should design their curricula.

Meso level:

The meso level falls in between the macro and the micro level (University of Suzanne Dworak-Peck, 2018). The meso level of decision making in the artefact refers to institutional organizational structures like the management of the institutions.

Micro level:

Micro refers to individual interactions that occur on a day-to-day basis in an organisation (University

of Suzanne Dworak-Peck, 2018). In the artefact, the micro level refers to the level in the organization where assessment activities take place, like the classroom or the clinical area.

Nursing education: Nursing education is the professional training and development of the character of nurses who are able to render professional nursing care to people of all ages, in health and illnesses, in any setting (Karlsson, Hillström, Johnsson & Pennbrant, 2020). In this study, nursing education refers to the training and development of nurses who are lifelong learners to engage with disease burdens in their context.

Low-income country: According to the World Bank (2021) countries that fall in the low-income group have a gross national income per capita of \$1,035 or less. In this study, the concept of low-income countries will be applied as described by the World Bank.

Background

The adoption of competency-based education (CBE) and its associated assessment approaches has posed a challenge in implementation for most low-income countries (Shrivastava & Shrivastava, 2018:1). The Nurse Education Partnership Initiative (NEPI) was a catalyst for curricular change towards the CBE in some African countries, like Lesotho (Cheptoo, 2019). The termination of the NEPI support left the resource-limited countries and their nurse education institutions (NEIs) stranded without the capability to sustain the resource-intensive assessment approach associated with CBE (Bvumbwe & Mtshali, 2018^a: 101; Bvumbwe & Mtshali, 2018^b). In addition, some institutions have no structures to support staff in implementing assessment strategies associated with CBE. The inability to sustain the resource-intensive assessment approaches associated with CBE has forced some NEIs to drift back to traditional assessment approaches that are not aligned with CBE (Khaahloe, 2008).

In Lesotho, the closing of the NEPI programme left some of the NEIs, compromised in their implementation of the CBE and its associated assessment approaches. Records from inter-nursing schools meeting minutes in Lesotho have revealed various factors that push the NEIs to revert to the traditional methods of assessment (Christian Health Association of Lesotho, 2022). According to Nyoni and Botma (2019) one of the NEIs in Lesotho is implementing programmatic assessment as recommended in the competency-based curriculum, however, at a high cost. This evidence suggests that poor assessment approaches may compromise the quality of nursing graduates. Therefore, there is a need for the development of an assessment approach for competency-based nursing education (CBNE) for institutions in low-income countries such as Lesotho in order to improve the quality assessment and its associated outcomes.

An assessment approach is a set of theories and principles that reflect a particular model used in the implementation of assessments in an educational programme (Lockyer, Carraccio, Chan, Hart, Smee, Touchie, Holmboe, Frank & ICBME Collaborators, 2017). In this study, an assessment approach refers to a set of theories and principles used in implementing assessment in an educational programme. A feasible assessment approach that is more feasible to use in low-income countries is ideal for the improvement of the assessment of the acquisition of competencies by nursing students. Therefore, the developed assessment approach would, to some extent, lead to improved assessment methods for the training of more competent nurses, who are able to competently tackle the disease burden in low-income countries.

Methodology

The PhD study has three phases in the development of a feasible assessment approach for competency-based nursing education in a low-income country. The study followed a phased multi-methods approach (Brewer & Hunter, 2006) underpinned by Design Science Research (DSR). The DSR design has three domains which are the environment, the research cycle, and the knowledge base. The three phases of the study are superimposed in the three domains of the DSR. In phase 1, the characteristics of assessment approaches in health professions education (HPE) were described through a mapping review in a submitted article (Mukurunge, Nyoni & Hugo-van Dyk, nd). Phase 1 of the study is superimposed in the knowledge domain of the DSR as illustrated in Figure 1.1.

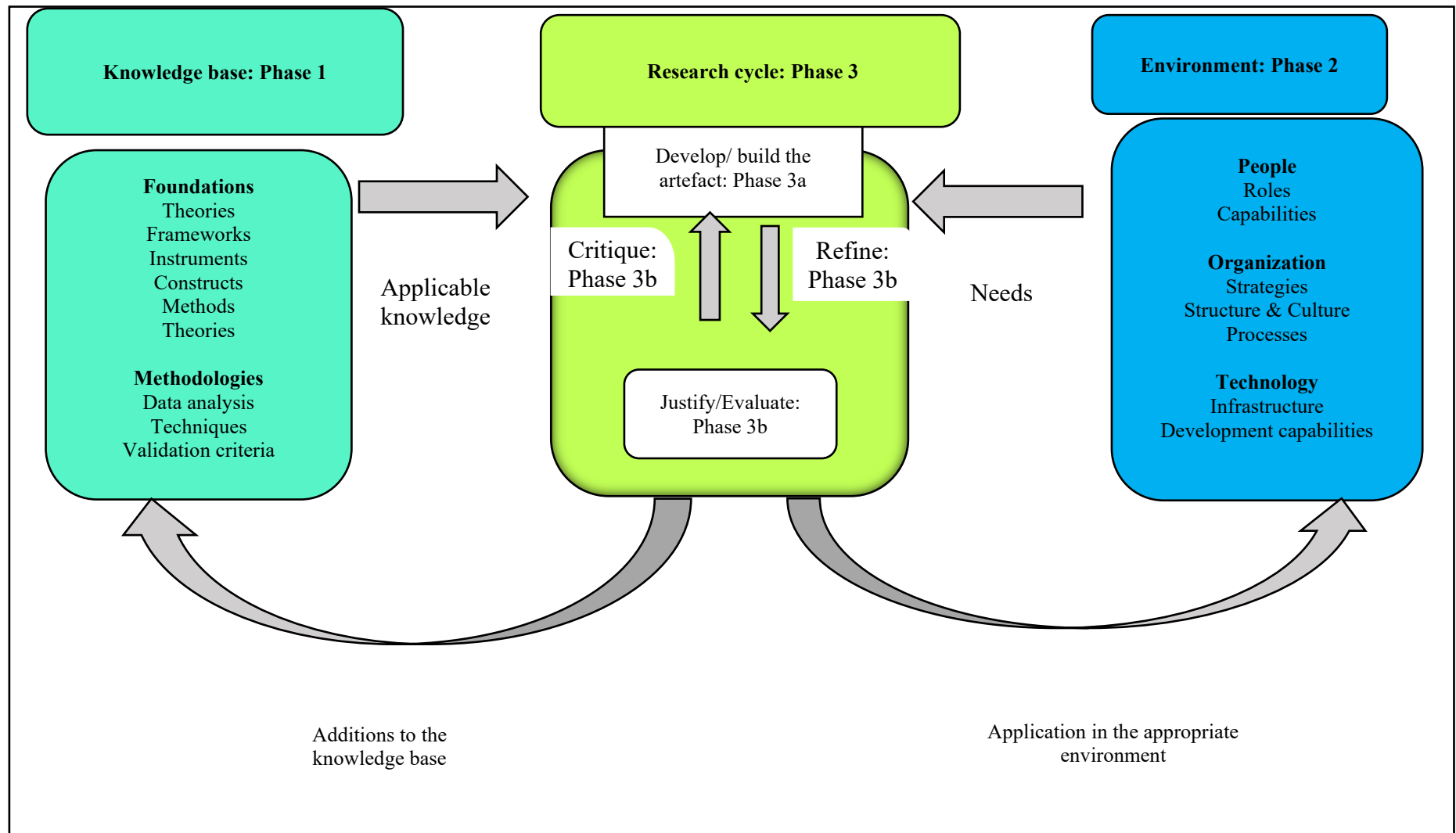


Figure 1.1: Design Science Research method for the development of the assessment approach, adapted from Weber (2012)

Phase 2 was informed by the environment domain of the DSR as in Figure 1.1. According to McKenny and Reeves (2013), awareness of the context of the problem or the natural environment is a critical initial element of the DSR design. In phase 2, data on the various contexts of nursing education institutions in the low-income country were collected using structured interviews. The content of the structured interviews covered components of the environment domain in the DSR. The components include roles and capabilities of people who work in the nursing education institutions; strategies, processes, structure, and culture of the nursing education institutions at the organisational level; and the infrastructure and developmental capabilities in terms of technology in each institution (Mukurunge, Nyoni & Hugo-van Dyk, nd).

Phase 3 is divided into two sub-phases which are phase 3a and 3b. In phase 3a the assessment approach, which is the artefact, was developed by the candidate under the supervision of the two supervisors of the study. In phase 3b the developed artefact will be critiqued validated by experts through a modified e-Delphi technique (Eubank, Mohtadi, Lafave, Wiley, Bois, Boorman & Sheps, 2016). Phase 3a and phase 3b are superimposed in the research cycle domain of the DSR, in Figure 1.1. The hallmark of the DSR design is the iterative nature of its processes. As each iteration progresses, investigators continually refine and rework the artefact guided by a variety of research methods that best fit the environment (Rossi, Henfridsson, Lyytinen & Siau, 2013). Design science research is based on collaborations among researchers and practitioners in real-world settings, leading to the development of contextually sensitive artefacts (Rossi et al., 2013). In phase 3b, the panellists, through the modified e-Delphi technique, will assess and refine the artefact in an iterative process until a 70% agreement is reached. The next section is a discussion of the assessment approach.

An Assessment Approach for competency-based nursing education in a low-income country

The results from the interviews and the mapping review were used in the development of the Assessment Approach. Table 1 illustrates the results from the mapping reviews. The Quarter model was selected to underpin the development of the Assessment Approach because of its resemblance to the competency-based curriculum.

The Quarter Model applies to both theory and practical assessments underpinned by the Programmatic Assessment approach. According to the Quarter Model, the following should be considered:

- There should be one assessment to be conducted at least every quarter;
- No one teacher should contribute more than a quarter (25%) of the marks for one student;
- No single tool should contribute more than a quarter of the marks;

- No single assessment should contribute more than a quarter of the total marks.

In the Quarter model, assessment of both theory and practical should not be done using a single assessment method. There are a number of assessment methods that can be considered, as shown in Table 1.

Table 4: Assessment models, frameworks, types, approaches and methods

Model	Framework	Type of assessment: (Clinical/Theory)	Assessment approach	Methods	Source
Ideal model		Both theory and clinical assessment		Essay examinations; short answer questions (SAQs); multiple choice questions (MCQs); patient clinical examination; problem-based oral questions; objective structured clinical examinations (OSCEs)	Walubo, Burch, Parmar, Raidoo, Cassimjee, Onia & Ofei (2003) (Walubo, et al., 2003)
Predictive Learning Assessment model	Earl's model of learning: assessment as, for, and of learning	Clinical assessment		OSCE using the Standardised Orthopedic Assessment Tool (SOAT)	Lafave, Katz, Vaughn & Alberta (2013) (Lafave, Katz, Vaughn, & Alberta, 2013)
Amalgamated Student Assessment in Practice model	The clinical reasoning framework	Clinical assessment		Scenarios and role plays	Zasadny & Bull (2015) (Zasadny & Bull, 2015)
Leadership Outcome		Clinical assessment		Scenarios	Wissmann, Hauck & Clawson (2002)

Model	Framework	Type of assessment: (Clinical/Theory)	Assessment approach	Methods	Source
Assessment model					(Wissmann, Hauck, & Clawson, 2002)
	Reporter-Interpreter- Manager-Educator (RIME) model (is developmental and synthetic as it integrates Bloom's KSA into clinical practice)	Clinical assessment			Pangaro & Cate (2013) (Pangaro & Cate, 2013)
	Bloom's taxonomy (KSA) which focused more on the final objective of education	Both theory and clinical assessment			
	Dreyfus and Dreyfus's developmental framework (novice, advanced beginner, competent, proficient, expert, master)	Clinical assessment			
	Miller's pyramid of competence	Clinical assessment			

Model	Framework	Type of assessment: (Clinical/Theory)	Assessment approach	Methods	Source
	Canadian Medical Education Directions for Specialists (CanMEDS) framework	Clinical assessment			
	The Accreditation Council for Graduate Medical Education (ACGME) framework	Clinical assessment			
	The Observer, Reporter-Interpreter-Manager-Educator (ORIME) model	Clinical assessment			Tham (2013) (Tham, 2013)
Quarter model		Both theory and clinical assessment	Programmatic approach	For theory: short answer questions (SAQs); multiple choice questions (MCQs), extended matching questions and oral examinations should be used. For practical/clinical assessment: experiments, long cases, short cases, spots, objective structured practical/clinical examinations	Singh, Anshu & Modi (2012) (Singh, Anshu, & Modi, 2012)

Model	Framework	Type of assessment: (Clinical/Theory)	Assessment approach	Methods	Source
				(OSPE/OSCE), mini-clinical evaluation exercise and objective structured long examination record	
Quarter model		Both theory and clinical assessment	Programmatic approach	For theory: SAQs; MCQs; long answer questions; For clinical assessment: ten-minute long cases; Four 5-minute long OSCE stations; four 5-minute-long viva-voce stations; directly-observed procedural skills	Singh, Anshu & Modi (2012); Gupta, Shah & Singh (2021) (Singh, Anshu, & Modi, 2012; Gupta, Shah, & Singh, 2021)
TEMM model		Both theory and clinical assessment		For theory: short-answer questions, fill in the blanks, true/false, matching items, and restricted response essays; MCQs. For the clinical assessment: performance exercises; ten-station objective structured practical examinations	Abraham, Upadhya, Torke & Ramnarayan (2005) (Abraham, Uphadhya, Torke, & Ramnarayan, 2005)

Model	Framework	Type of assessment: (Clinical/Theory)	Assessment approach	Methods	Source
	System of assessment framework	Both theory and clinical		For theory: MCQs; National Board of Medical Examiners clerkship shelf examinations For clinical: OSCEs	Colbert-Getz & Shea (2020) (Colbert-Getz & Shea, 2020)
	Assessment framework based on the Bayer–Fetzer Kalamazoo Consensus Statement			OSCEs	Rider, Hinrichs & Lown (2006) (Rider, Hinrichs, & Lown, 2006)
	Entrustable Professional Activities framework				Violato, Cullen, Englander, Murray, Hobday, Borman-Shoap & Ersan (2021) (Violato, et al., 2021)

NB: Grey scale sections were not reported.

The results from the interviews in phase 2 of the study were analysed using a deductive thematic analysis approach with predetermined themes from the Design Science Research approach of People, Organisation and Technology Weber (2012). The analysis yielded six domains as illustrated in Table 2. Table 2 illustrates how the domains are applied at a micro, meso and macro level in the implementation of the assessment approach.

Table 5: The six domains from the thematic analysis of phase 2 data

DOMAINS	MICRO LEVEL	MESO LEVEL	MACRO LEVEL
1. Curriculum, Academic planning, and moderation	1.1.1 Educators as moderators 1.1.2 Educators as assessors, 1.1.3 Educators as trainers	1.2.1 Yearly master plan reflecting assessment schedule per module 1.2.2 Moderation of all assessments 1.2.3 Appropriate and cost-effective assessment method 1.2.4 Competency-based curriculum 1.2.5 Student centred learning 1.2.6 Physical resources for assessment 1.2.7 Infrastructure for e-assessment 1.2.8 Cybersecurity related to institutional assessments.	1.3.1. Institutional/independent assessment practice 1.3.2 National standardised infrastructure for assessment
2. Faculty capacity and development	2.1.1 Capacity development on assessment and moderation 2.1.2. Capacity development on evidence-based assessment and research in assessment	2.2.1. Educator performance appraisal 2.2.2. Educator essential assessment competencies 2.2.3. Monitoring maintenance of educator essential assessment competencies 2.2.4. Monitoring research output in Assessment.	2.3.1. National strategy for faculty development on Assessment 2.3.2. Continuing Professional Development in Assessment 2.3.3. National Nurse Educator Faculty Development Coordination

DOMAINS	MICRO LEVEL	MESO LEVEL	MACRO LEVEL
3.Stakeholders		3.2.1.Involve student in assessment evaluation. 3.2.2. Internal mechanism/committees for monitoring assessment	3.3.1.Professional authorities/bodies that monitor assessment. 3.3.2.Clear terms of reference for organisation boards regarding institutional assessment strategy 3.3.3 External mechanism/committees for monitoring assessment
4.Evidence Based Practice	4.1.1.Evidence-based assessment practices	4.2.1.Periodic review of assessment practice 4.2.2.Adoption of innovative evidence-based assessment practices	4.3.1.Partnership with external institutions/ bodies on research in assessment
5.Assessment Methods/techniques/ Blueprints	5.1.1Logbooks, checklists, 5.1.2 Training of supplementary human resources on assessment	5.2.1Blueprint of all learning outcomes 5.2.2Relevant and updated taxonomy for assessment 5.2.3Assessment policy aligned with the curriculum model and assessment design principles.	
6.Organisation and Finances	6.1.1Capacity development for administrative staff on budgeting for assessment	6.2.1 Budget for assessments 6.2.2 Budget for capacity development in assessment 6.2.3 Budget for technology related infrastructure for assessment 6.2.4 Institutional meetings and planning for assessments	

Implementation of the assessment approach will be at three levels of decision-making. The micro level is in the classroom and the clinical area where educators interact with students as they administer assessments. The meso level refers to the organisational level where structures in the organogram make institutional decisions about the implementation of assessment. Key offices like the Quality Assurance and Academic Head are involved. At the macro level activities and decisions about assessment are made outside the institutions of learning by external stakeholders. The external stakeholders include professional bodies and the Council on Higher Education. The Assessment approach follows a Systems approach of Inputs, processes and Outputs (Hastuti, Zahro, Untari, Rahman & Tahar, 2021). Figure 2 depicts the developed assessment approach.

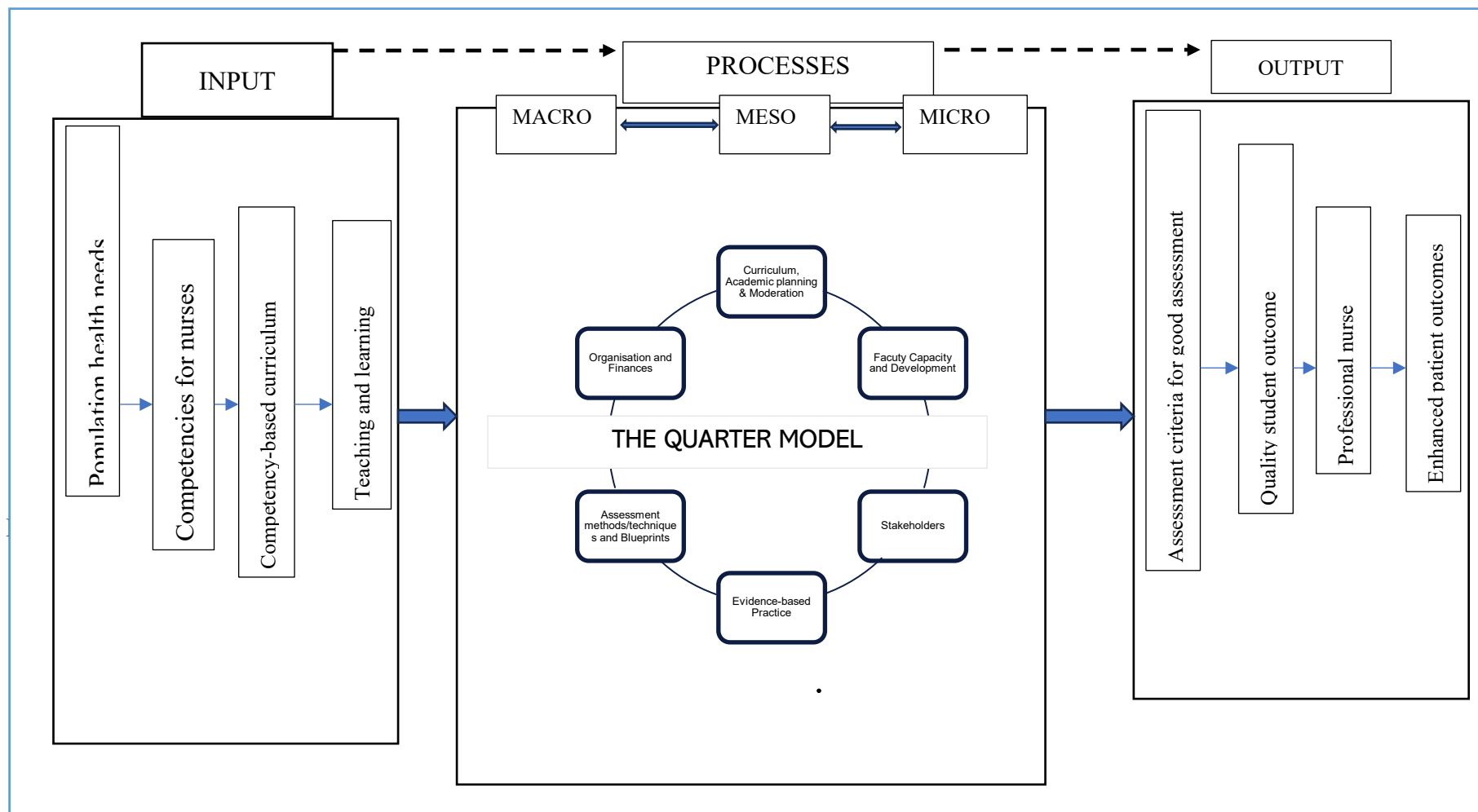


Figure 2: The development of the assessment approach

Description of the Assessment approach

The assessment approach is underpinned by the systems model which has inputs, processes, and outputs (Evans, 2020). A system is a collection of interrelated components that work together towards a collective goal. A system receives inputs and transforms them into outputs (Mbarara University of Science and Technology, 2022). Sidik (2022) argues that for a system approach to be used more effectively components of feedback and control should be incorporated. In this study, control and feedback are inherent in the assessment approach. These will be discussed in the sections that follow.

Inputs

The inputs to a system are raw materials that can be processed into outputs (Sidik, 2022). However, the raw materials can take different forms not necessarily the physical form. A competence-based programme is set to produce competent lifelong learning healthcare professionals who can tackle disease burdens in their context. Therefore, for an assessment approach such as this, the antecedents should include the health needs of the population, competencies that the health professionals should possess, the teaching and learning activities of the programme, and a competency-based curriculum. These are illustrated in Figure 2. These inputs are intertwined and they inform each other. The development of a relevant competency-based curriculum needs a thorough exploration of the health needs (Lopez-Medina, Álvarez-Nieto, Grose, Elsbernd, Huss, Huynen, & Richardson, 2019). The findings of the exploration of the population's health needs determine the competencies that the nurses should possess, which will be incorporated into the curriculum and hence inform the teaching and learning activities.

Processes

The process part of the system is where decisions about inputs in the production of outputs are made (Galais, Fernandez, Font, & Smith, 2020). In this assessment approach, the processes to be followed in the implementation of assessments will be at micro, meso-, and macro levels. The micro level covers the implementation of assessment on a day-to-day basis in the classroom and in the clinical area. At the meso level, assessment implementation is monitored at the organizational level. The organizational level includes key offices of decision-making that appear in the organogram of the institution like the Quality Assurance Office, offices of heads of programme and the Academic Head. At the macro level, external stakeholders are involved in monitoring the implementation of assessments in national training institutions. The external stakeholders include governing bodies like the Nursing Council, the Ministry of Health, the Academic Senate, the Institutional Board, and the Council on Higher Education. Processes involved in assessment at the three levels of decision-making will be discussed for

each of the six domains that emanated from the thematic analysis of data gathered from structured interviews in Phase 2 of the study.

Domain 1: Curriculum, academic planning and moderation

In Domain 1, the curriculum, academic planning and moderation of assessments are essential to assessment. At the macro level, the curriculum should be a competency-based learner-centered curriculum which is underpinned by four principles which are constructivism, constructive alignment, scaffolding and authenticity. If more than one institution nationally is implementing the competency-based curriculum, then there should be national standards of assessment implementation. At a meso level, the key offices in the institution should ensure the correct implementation of the competency-based curriculum and the development of a clear yearly master plan of academic activities that reflects assessment schedules per module. Appropriate and cost-effective assessment methods should be utilized in both theory and clinical assessments. Physical resources for the implementation of assessment like the classrooms, clinical areas and simulation laboratories should be made available. In order to secure assessments during their development and transfer between examiners and moderators electronically, features of cybersecurity should be put in place by the key offices in the institution. Implementation of assessment at the micro level requires educators who are competent as assessors and moderators of assessments. This can be achieved through assessment training workshops where dedicated knowledgeable educators in assessment are assigned to facilitate the assessment training workshops for other educators in the institution. In addition, the strategy should outline competencies required in continuous professional development in assessment implementation for educators.

Domain 2: Faculty capacity and development

Faculty capacity and development in assessment is the focus of Domain 2. At the macro level, it is essential to develop a national strategy for faculty development on assessment. The office's mandate will be to develop a strategy to empower and monitor faculty development in terms of assessment as well as assessment competencies that educators should possess. At the meso level, the key offices in the institutions should draw institutional essential assessment competencies from the national strategy on faculty development. The institutional assessment competencies should have an inherent monitoring strategy for the attainment of these competencies by educators. Faculty development in assessment can also be monitored through scheduled periodic performance appraisals of educators. At the micro level assessment

workshops should be facilitated to all members of staff by competent dedicated faculty members.

Domain 3: Stakeholders

The external stakeholders assume both monitoring and advisory roles in institutional assessment implementation. The Ministry of Health and the Nursing Council can establish external committees for the uniform monitoring of assessment implementation by national institutions. Each institution should have an Academic Senate made up of professional experts capable of monitoring and advising on assessment implementation. There should be clear terms of reference in place for institutional Boards so that assessment strategies are implemented seamlessly regardless of the individuals that occupy positions on the Boards. At the meso level, student feedback on assessment can be used in the development of assessment checklists. Institutional assessment committees can be established for monitoring assessment implementation.

Domain 4: Evidence-based practice

Domain 4 of evidence-based practice refers to institutions undertaking assessment-related research, adopting and using guidelines and practices informed by research. At the macro level institutions should engage in partnerships with external institutions on assessment research to enhance research output and capabilities. At the meso level institutions can have a culture of reviewing assessment practices and adopting innovative evidence-based assessment practices. At the micro level educators should implement assessment using evidence-based practices.

Domain 5: Assessment methods, techniques and blueprints

In order to implement affordable and reliable assessments institutions should ensure the selection of the correct assessment methods for given learning outcomes. There are various assessment methods in use for both theory and practice. At the meso level, the Assessment committees and Academic committees should develop blueprints according to current or revised taxonomies like the Krathwohl taxonomy. The blueprints should be aligned with learning outcomes for all modules in the curriculum. Institutions should develop assessment policies that are aligned with the curriculum to guide assessment implementation. At the micro level educators should administer assessments utilising the appropriate assessment methods. For example, results from the interviews in Phase 2 revealed that implementation of assessment in a competency-based curriculum is more expensive in Objective Structured Clinical Examinations (OSCEs). Liu (2012) introduced workplace-based assessments. The argument is that OSCEs tend to deconstruct the patient-health-practitioner interaction. The workplace-based assessments are more authentic than OSCEs because they take place in a real clinical context. All the areas of competence expected in Miller's pyramid are addressed. According to

Liu (2012), assessment of competencies in the clinical area is cost-effective since there is no need to train standardized patients and the resources that the student will use in the assessment belong to the clinical area. Examples of workplace-based assessment methods that can be used are Direct observation of procedural skills; mini-clinical evaluation exercises and case-based discussions. Therefore, in the implementation of cost-effective assessments institutions of learning can consider using workplace-based assessments instead of OSCEs.

Domain 6: Organisation and finances

In order to operate at their optimum level, all departments in institutions should be operating in sync. Therefore, Administrative staff in institutions should get training on budgeting processes for assessment activities in the programme. At the meso level, the Administrative staff should develop budgets that pertain to assessment in terms of capacity development of educators, and technology-related infrastructure like computers. Administrative staff should take part in institutional meetings where planning for assessment takes place. At the micro level, the Administrative staff should attend capacity-building workshops on budgeting for assessment activities in the institution.

Outputs

Outputs are the results of the processing of the inputs (Galais, Fernandez, Font, & Smith, 2020). As shown in Figure 2, the outputs are assessment criteria for good assessment, quality student outcomes, professional nurses, and enhanced patient outcomes. There is interaction among the elements of the outputs. A good curriculum should have assessment criteria for good assessment in alignment with the student outcomes. Good-quality student outcomes will inform the production of a professional nurse who will be competent to enhance patient outcomes. The implementation of the curriculum and ultimately assessments should be underpinned by the four principles of the competency-based curriculum which are constructivism, constructive alignment, scaffolding and authenticity. The four principles are discussed in the next sections. Constructivism is a learning theory that states that students construct their own understanding and knowledge of the world, through experience and by reflecting on their experiences. Learning occurs in cultural contexts and social interactions (Fernando & Marikar, 2017; Vygotsky, 1978). The premise of the constructivism theory is that learning is enhanced when the student is an active participant (Fernando & Marikar, 2017). Therefore, the competency-based curriculum is student-centered with the educator acting as a facilitator of the learning process.

Constructive alignment is a theory that was postulated by Biggs (2003). The theory works in agreement with constructivism. In constructive alignment, students still construct knowledge,

guided by the activities formulated by the facilitator (University of Queensland, 2018). This means that the curriculum's intended learning outcomes, teaching and learning methods, and assessments have to be aligned with each other prior to the actual learning taking place (Ali, 2018; Biggs, 2003; Wilkhamn, 2019).

Scaffolding is a way of enhancing the performance of students, from their current, independent level of performance, to a higher, assisted level, at which the provision of support guarantees success (Bruner, 1975; Pol *et al.*, 2015). Scaffolding originates from the concept of zone of proximal development by Vygotsky. Vygotsky (1978) postulates that, while learning takes place, there are tasks that students can do independently and others that are beyond their capabilities. The area between what the students can do independently and that which they cannot do is the zone of proximal development (Eun, 2019). The idea of a zone of proximal development suggests that students learn best just beyond their range of existing experience if they receive assistance from their facilitator and peers. Assistance in the zone of proximal development forms a bridge between what students can do independently and what they can do with assistance. Assistance in the zone of proximal development is referred to as scaffolding (Aslam, Khanam, Fatima, Akbar & 2017; Muhammad, 2017)

Authenticity is defined in the Cambridge Dictionary (2019: online) as the quality of being real or true. In learning, authenticity refers to the state where learning environments provide a learning context that reflects the way knowledge and skills will be used in the real environment (Bland, Topping & Tobbell, 2014; Roach *et al.*, 2018). The facilitator of learning has to strive to always provide authentic learning environments and tasks, in order to motivate learners to enhance their level of understanding and improve information recall (Woods, 2020).

Conclusion

The developed assessment approach has to be tested in a low-income setting before rolling it out on a wide scale. The implementation of this assessment approach may lead to enhanced feasibility of assessments in the competency-based curriculum and ultimately patient outcomes.

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ADDENDUM Q

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ADDENDUM R: DEDUCTIVE CODING PROCESS

EXCERPTS	DSR THEMES	CODES	CATEGORIES	SUB-CATEGORIES
	PEOPLE (Roles and capabilities)			
Would you please describe for me the type of curriculum that you are using at your institution?				
So the type of curriculum that you're using it or institutions, is the competency based. Curriculum which is guided by 4 principles which are: constructivism; Scaffolding. Constructive alignment and authenticity				
The curriculum is a learner centred curriculum where the learners take charge of their own learning to construct new knowledge, deconstruct the old knowledge, and construct the new knowledge, and are also guided by Study guides or workbooks that have got instructions and activities that the students are able to engage in the process of accumulating knowledge for themselves.				
From what you are saying, could you briefly say under Constructivism, I think I get that part. Could you talk more about constructive alignment,				

authenticity and scaffolding? What are you doing exactly?				
So, on constructive alignment we are basically structuring the curriculum using the Biggs theory of the constructive alignment triangle where we are saying learning outcomes in the curriculum, are aligned to determine the teaching and learning activities that are going to be carried out by the facilitators in class or in various learning platforms, and then that's also what we will link to the assessments that we will subject students to in order to measure whether they've attained the required competencies for each level,.				
in authenticity our system is: our teaching and learning are carried out in authentic environments. Some of these authentic environments are communities where we send students to. This is where they will get their teaching and learning activities and also the assessments for their learning happen in those authentic environments				
For scaffolding the curriculum is structured such that it supports the learning of the required content and skills and it builds up the student to say the student should understand what is happening in the community in the first year.				
In the first year, they have to understand how to take care of a patient at a Primary Health care center, where the patient from the community is referred to. And then from there in their final year they learn how to provide comprehensive nursing care to patients who are admitted in district, regional and referral hospitals.				
The structuring of the curriculum and the implementation of this same curriculum also followed the design down and deliver up approach where we first have to come up with the competence or the exit outcomes that we expect for this particular student				

You design, the activities prior to any teaching, for example if this student is supposed to be able to provide comprehensive nursing care to a patient. What should this student learn? How will it be taught? And How will it be assessed? And then when we are implementing, then we implement going upward.				
From the teaching, what are we teaching? How are we going to assess and then are we going to be able to determine that this student has acquired that particular skill				
How do we teach this student and when we look at how we teach, we also look at learning outcomes, to say was this the appropriate teaching and learning strategy that we use?				
Now we also look at the assessment part to say the learning outcome is for example provision of comprehensive care. Did we teach this student to be able to provide comprehensive care and how do we assess.				
certain outcomes can be assessed in theory, but other outcomes really need to be assessed, in practical like when we are doing the OSCEs				
In the learning process, the authenticity part is students are exposed to real life learning situations where they are taken through the simulation.				
Prior to going to the clinical area they go through the real life situation as well as in the assessment assessment like for the practical assessment they do the OSCEs not in the clinical area but in the simulation lab with simulated situations and with standardized patients creating closer to real life situations which are used in the assessment, making sure that there is authenticity				
In scaffolding where the teaching and learning starts from the basics or the foundations, we build up until we get to the complex level, starting with the simplest going to the complex. So even the				

assessment, how we assess the first year is not the same way that we assess the second year is not the same way that we are going to assess the third year.				
So there is that type of scaffolding where there assessing and determining whether the students still need support, supporting and reassessing.				
I want to know like in the last statement you talked about the way you assess first year would be different from the second and third. Can you correct my understanding would be like you are saying that when you assist a first year, then when you get to the second year you are building onto the assessment that was done in the first year. Are these assessments linked or they are far apart from each other?.				
The assessments are actually linked because we are building on from the basics like for example the first years when they go for clinical placement in the wards they do the basic nursing activities of daily living, so they will be doing the bed baths of patients, feeding patients, and the making of the beds observations like temperature and Bp are done. When it comes to the assessment, we are going to assess them on that. When they go to 2nd year we are not going to assess them on how they take the temperature but we know we expect them to be able to take the temperature so that will not really be the focus of our assessment.				
In 2nd year, because that is a primary healthcare, yeah, we are focusing on them consulting patients, examining the patient, making a decision to say what is this? I have checked the the vital signs and this patient is complaining about this. I think this patient is having this and maybe the management could be this. So that is at a much higher level than at the first year				
In third year, they are at the hospital level where they are taking care of those acute cases that are				

managed at the hospital and also managing patients who are having complicated conditions using a lot of hospital machinery, a patient who is maybe let's say who is having poor oxygen saturation? They have to be able to manage that so the assessment cannot be the same as in first year. That is how the assessments build up on each other.				
Do you have any guidelines with regard to how many assessments per semester theory and practical. Are you guided by any assessment document that you probably use? In OSCEs and clinic-based assessments, that's for practical and in theory, can we look at the different types of assessments that you use? So maybe we can break it down bit by bit to say how many assessments do you do per semester? Is there any guideline with regard to that?				
There are guidelines in the curriculum and the assessment policy in terms of the number of assessments that students should be engaged in per semester				
The program of assessment also guides in terms of the levels of assessment in terms of the cognitive levels that we need to examine at different levels and the percentage which is the minimum percentage for the assessor to construct the various assessments that they are constructing for students				
When it comes to the issues of, which other assessment methods do we use in the theory. We have theoretical tests that we are giving in classes. We are using the multiple choices where we might use some of the objective items like the true or false or the matching items and structured questions				
We have also developed guidelines in terms of the use of portfolios to assess students in various modules, not all modules				
Students do online assessments and also online quizzes that we use for testing whether they have acquired the necessary theoretical knowledge.				

There is the use of the blueprint which also focuses on the learning outcomes and the different levels of cognition that are assessed.				
In the assessments, there is a focus on using the Bloom's taxonomy in determining the different levels that we are assessing which helps us to align our assessments with the learning outcome.				
Can you briefly tell me how you integrate them to guide assessment because you have blueprints, you have a program of assessment, you have a policy, you have a curriculum. How do you integrate, how do they speak to each other to then guide the whole assessment process?				
The programs of assessment was developed as a recommendation from recent evidence that states that assessment in CBC should actually be by programmatic assessment. Not looking at singular points of assessment. So when we were developing the programs of assessment, we actually had the curriculum by the side. So we were looking at the curriculum in terms of the outcomes and then used the outcomes to say what type of an assessment can we use and at what level are we assessing.				
So the very same programs of assessment, at each level of the curriculum like the first year, second year, third year level there is also a blueprint for every semester which was designed to say how are we going to split the assessment in the content that is being assessed for each module or for each level so that the content of modules is spread across the semesters for example, pharmacology which has part 1 and 2 in order to avoid repetition and also missing out other topics				
The other one is the assessment policy. When it was reviewed, it was reviewed in line with the demands and the requirements of competency-based education, so we had to change the assessment policy to match the requirements and the demands				

of the competency based curriculum that we had, also the demands that were are coming from the programs of assessment.				
With the blueprint every module when we are doing the assessment, particularly t summative assessment, the assessment has to address the learning outcomes and also look at the amount of time that was spent on a specific theme in the module, and then determine how much of the questions will be in the assessment and also determine what percentage of questions will be of low cognition and what percentage will be of a high cognition.				
In the programs of assessment. Do you have one assessment you do per year to say now this is 1 assessment that covers everything for each year for you to proceed to the next year?				
No, not necessarily one. They are many summative assessments for each module.				
The other factor that determines how many assessment points will be there will also be the weight of the module. We have modules that are quite so small that they take half a semester so much as you may have wanted to assess this student, maybe at three or four different points the content does not.				
allow, but at the minimum you find that there will be 2 continuous assessments which go to the summative assessment but in between there will be quizzes and the assignments for formative assessment. But then you also have the modules that are heavier. The modules that are heavier You may find that the student experiences not less than two assessments in the course of the semester and the module. Those assessments will also depend on how much content has been covered, which is being assessed and what are the learning outcomes that are being focused on.				

Now let's come to the educators themselves. What role do they play with regard to assessment? And also kindly share their capabilities in terms of conducting assessments or meeting these assessment expectations of competency-based education.				
So the role of the educator in as much as they are facilitators in the process of the teaching and learning. They also are involved in formulating the assessment items marking of the assessments and also doing the item analysis and writing reports afterwards.		Educators are facilitators; formulators of assessment items; markers of assessments; analysers of assessment and writers of reports	Roles of nurse educators	Develop assessment;
Every semester before assessment time, the summative assessment time approaches, all the educators are exposed to or are subjected to capacity building workshops and orientation or reorientation for those that are already in the system				
No educator goes into the setting of assessment without the capacitation workshops on how to do assessment,				
In the workshop there is a refresher on what is essentially assessment, different types of assessments why assessments are done; what are the principles of the best or a good assessment and what is their role?				
In the workshops the educators are also reminded that in the teaching, learning process, students will come up with so much information, some of which may not be in the popular books. The educator may not be aware of it so we need to validate such information and be able to say OK this is a valid information from a valid source. In that case they		Educators develop and amend the marking guide accordingly	Roles of nurse educators	Develop assessm

need to extend the marking memo so as to include the new information from the students answers				
For the practical assessment. like for the OSCEs they still have to go through orientation or training on how to do an OSCE; what is expected of them and how the OSCEs are run and what is their role in the running of the OSCEs..				
They are also trained on their role in training standardised patients in the OSCEs		Educators train standardized patients	Roles of nurse educators	Training of SPs
For these capacity development programs, do you use local expertise or do you outsource by local I mean from the institution, the stuff that you have with the institution or do you also outsource external expertise in terms of these capacitation programs?				
No, we are we are using the local expertise		Educators from the institution have expertise to deliver capacity building workshops	Expertise of nurse educators	Experise to delive
Capitation usually begins at the beginning of the semester, where we capacitate staff on implementation of assessment in each module and we also capacitate staff towards the final examinations.				
Initially, we had some external capacitation from the affliator but now we have been using the local expertise because they are really knowledgeable about the context and the challenges in the context.		Educators have gained expertise from external trainers and are currently good at training for they are knowledgeable about context	Local expert educators knowledgeable about assessment and context	capability to apply

		and its challenges		
They know the challenges that each facilitator might be actually having, and who is new in the system; Who is old in the system? Who do we need to engage now, or do we need to engage all the people or we are actually setting aside this workshop for certain people that are have to assess a module with a method which is different from others.		Local experts have knowledge of the context and can relate better with the educators	Local expert educators knowledgeable about assessment and context	capability to apply
The institution also has a established the Faculty development office, The office is actively involved in the CAPACITATION or the orientation of all the educators in the institution, not necessarily on the assessments only, but also other aspects of capacitation. But during the assessment, yes, that is one of the roles of that particular office				
How do you monitor the assessments? What plans do you have in terms of monitoring assessments?				
One of the tools that we have, is the academic master plan which has highlighted all the activities for that particular academic year and when assessments are supposed to be conducted. And then we also have an assessment activity plan which outlines when assessments are supposed to be set by what time when they're supposed to have gone for internal moderation when they're supposed to go for external moderation, and when the corrections have to be done, and the submitted for printing at the coordinating office in Maseru				
Assessments are conducted at the time according to the activity plan.				

We have the office of the Head of academics and we also have the Academic committee which are actively engaged in the academic activities and also keep a track record of the teaching and learning as well as assessment.				
Before assessment as are administered to students, whether formative or summative, in every module, every assessment has to be moderated internally as a quality measure and then corrections are done and then assessment administered.				
We also have adherence to the assessment policy, which also determines how assessments are supposed to be done, all the educators are knowledgeable about the assessment policy and how assessments are supposed to be conducted.				
The Academic committee is there to oversee the issues of assessment internally, and it's the one that actually appoints internal moderators for each module, And also issues of mentoring of junior assessors before they are left to start assessing on their own				
Academic committee, there's the Senate. So the academic Senate oversees, all the summative assessments.				
We make the assessment activity plan that is submitted to Senate at the beginning of every academic year to say this is how we are going to assess and these are the activities related to assessment and				
the Academic Senate gives oversight and also advice to say in terms of your assessment here how about you change it for the next academic year.				
If I may get this clear, the Senate is it's made up of experts with regard to assessment.				

Yes, the Senate is made up of various people, and then there are people who are having qualifications in Health Sciences education assessments. There are two people who are give us oversight in terms of assessment of theoretical outcomes, and then also the practical outcome. There's also some two experts who were recruited because of their expertise in practical assessments				
If I get it clear in terms of your structure, maybe you can fill in. I see there's there's ahead of academic affairs. Then there's an academic committee. Then there is a Senate. Who is above the Senate and also who are the other people below the academic committee?				
the Academic committee is made up of the heads of programs; the deputy principal; the Quality assurance officer, the clinical supervisor and the Faculty Development Officer.				
the heads of programs, bring to their academic committee, issues related to assessment in their programs even issues of remedial remediations that are being done, or students who are identified as struggling, struggling in terms of their assessments or their learning.				
When they bring this to the academic committee, the academic committee, take them to the management before they are taken up to the Senate disgusted Senate, if it is a matter that needs to be discussed at the level of the Senate.				
In the Academic Senate is a committee called the EXCO (examination committee) which is made-up of people who are experts in assessments.				
There are four people who are experts in assessment. They're the ones that sit, with the school representatives to discuss student results and to discuss issues related to assessments on a scheduled date and approve results which then will be published at the school.				

In terms of the organogram we have the Proprietor below which is the school board and then below the school board, we have the Senate and below the Senate, we have the management and below the management we have the academic committee.				
And the board and the proprietor are not involved in assessments?				
No				
What technological infrastructure do you have available to support assessment for both theory and practical?				
Starting with practical assessment we have the simulation which is equipped with different levels of fidelity of mannequins. We have high fidelity mannequins. We have medium and we have low fidelity mannequins which are used in the different levels of assessment depending on the program and also the exit level outcomes that we are assessing				
We have a learning management system which is the Moodle. On the Moodle students are able to undertake different types of assessments, quizzes, and assignments				
This Moodle platform is dependent on the Internet. So the institution also has an availability of Internet which is accessible to all students and educators				
Although sometimes technology can let us down, so our students have access to data other than do Wi-Fi connectivity as well as the educators.				
In terms of ongoing assessment, they can do assessments online formatively using the Moodle platform, although we have not used it for summative, assessments				
The school has a physical server installed in one of the offices to which school office computers for most educators are connected.				

We usually retrieve some of the assessments from the server. When educators set assessments from their desktops they have to protect them using passwords.				
We also have an online cloud server through the departmental emails. Each department has its own email address where assessments are uploaded into a cloud.				
We send password protected summative assessments electronically for external moderation.				
The marks that the students obtain from their continuous assessments and also from their final assessments, are entered into the FEDENA system. FEDENA is an electronic system that calculates the final grade.				
Transcripts are also printed from the FEDENA system since it holds all the academic information for each student from their first year of study to the end of their study.				
Recently we have acquired an audio visual system in the simulation lab. The moderator or some of the examiners can actually be marking the student in real time away from the student				
We have first years portfolios and the midwives research presentations, that are done remotely from the external examiner. Students are recorded while presenting their work for their summative assessment at the school. The recorded presentations are then shared with the external electronically.				
What developmental capacity do you have with regard to developing a technology related to assessment? Like software development or maximizing the use of learning management systems in terms of assessments, even those simulation. What capacity do we have to further develop those things you have and improve them.				

We cannot really say we have a lot of capacity. We are still in our infancy. There were some workshops and webinars which were being advertised but we didn't manage to attend. But there is room for improvement in such areas.				
In terms of the Google applications, we've managed to take the Google forms for some of the assessments when students are in remote areas for their learning, where we were giving them some quizzes and then they record them for self-testing in terms of their clinical engagement.				
Some use the Google forms to evaluate their learning in the clinical placements before the placement period comes to an end so that we are identify their challenges and address them before they lose much time				
Covid 19 really showed us that we still have limitations in terms of using electronic assessment strategies. We are under utilizing our LMS.				
At some point there was some talk we were supposed to receive some training for all the educators in terms of the Moodle learning management system but also in terms of using the platform as an assessment platform. But then the issues of funds				
However, there are still plans in the Faculty Development Unit where there is a program that has been developed with different capacitation activities, or areas where we need more capacitation. So that is one of the areas maybe in this financial year, since the budget is available we can get capacitation, maybe get expertise from outside to come and help us see how best we can still use the learning management system.				

To what extent are you using evidence based processes to guide your assessment? And I want this answer to be responded probably in two ways, #1. Are you using evidence to guide what you are doing? Then #2? Are you generating evidence from what you are doing that you can also then share with others that we are doing this because it's working in our system.				
Yes, we are using evidence. When the competency based curriculum came, it really demanded the use of a lot of evidence.				
We have been attending some of the webinars in terms of assessment. I think there are so many webinars every month that we are attending that we are linked with our senators because our senators in the assessment, when they identify some problems in terms of where we are lacking new evidence, they usually refer us to someone who can capacitate us or they can capacitate us themselves or they link us to a webinar which can capacitate us				
We have been having some benchmarking activities as well.				
We have also been a given some materials to actually read their about evidence regarding the OSCE testing language. We have been given some recent articles which were arguing about the validity of some of the testing especially during the COVID-19 pandemic where we had to do online practical tests				
We usually invite 2 preceptors for our final summative assessments to be part of the examination. We make sure that these people come from the clinical area where they are implementing evidence in terms of patient care				

They usually advise us on our assessment checklists on what steps will be missing or what needs to be changed according to evidence. I think 123 steps are missing in terms of the current evidence that we're having from the clinic or area. And then we have to make amends in order to align to evidence and pedagogical evidence.				
We also engage in academic conferences. One of them is SAAHE. Every year we participate in that and we gather a lot of evidence in relation to the teaching and learning practices and also in terms of assessment as well as keeping abreast of what is prevailing.				
We have generated some evidence, it may not be a lot of evidence, but they have been I think some few papers that have been published a there has been a paper that has been published relating to scaffolding and				
A recent one which talked to the fidelity of implementing a competence-based curriculum during the a disruption and the issue of assessment is actually very well addressed there because that is the time we learned how we wish we could be able to assess students effectively using the electronic platform, but we don't didn't have that capacity and that one actually came out in this paper to say much as the constructive alignment and the scaffolding and the authenticity were emphasized progression was not well sequenced because now we couldn't assess students much as they learnt things a long time ago				
How well are the nurse educators empowered in terms of publishing their work that you are doing in competence-based curriculum?				
I think that one is it There is still has quite a gap. Not many Educators are interested in research. They feel that it is difficult.				

We have the potential of capacitating more because among the senators we have also some research experts that have already started giving some capacitation in terms of supervising students.				
The Research committee in the school is planning to bring everybody on board and you really visit this research aspect and see how many people we can bring on board so that they can also be engaged in the research activities?				
There is a budget for capacitation on research and also producing research in itself as an institution. We have developed a research agenda which is addresses a lot of academic issues with assessment as one of the major ones, but also we have added issues of governance and the administrative aspect to it.				
What is your research agenda with regard to the work that you are doing? Do you have any specific research agenda with regard to the implementation of competence based curriculum?				
Our research agenda addresses competence based curriculum issues around community based education; clinical teaching; assessment; theoretical teaching.				
We have been trying to work in collaborations so that the impact of our research output becomes big.				
We are still having our budget approved for support of research in terms of conferences, and research				
how do you ensure issues of validity, reliability and feasibility of the assessments that you give?				
Feasibility in practical examinations is tested by us inviting some staff members from the clinical area to the school of nursing; that is after the exams have been moderated. We test the stations in terms of their feasibility in terms of time and feasibility in terms of the resources that are there and what is expected to be done				

This has also assisted to review our blueprint				
As a result we have managed to determine things that will be examined using OSCEs. These are limited to tasks that we know we can do with a standardized patient or we can do with a high-fidelity manikin or a task trainer. The rest have been set aside for examining the students as Directly observed practicals.				
In terms of the authenticity, we have some of the modules that do not have a written paper like our community module in first year. The student has to go to the real community where they are observed as they interact with real people When they come back, they prepare a portfolio which is their final examination in their presentation.				
We are also learning in terms of assessments in competence based curriculum that assessment is actually resource intensive as opposed to the old curriculum				
In the old curriculum for their practicum, there will be assessed on 2 procedures, which were not even standardized. One could do a temperature, the other one an injection. They both pass or one passes, and the other one fails. So there wasn't that standardization of assessment,				
But now that we are using the competence based curriculum and OSCEs all these students are exposed to the same situations and same questions and same everything.				
As result assessment has become much fairer.				
But there's a lot of resources that are needed to be put in and sometimes you find that when resources are limited, people will cut corners and maybe may not even assess students fully or comprehensively				

You find that in some institutions they will even say no, we are not putting 10 stations, we will just use five stations and that is a summative assessment. And if you look at the learning outcome that we are trying to assess, the learning outcome hasn't really been fairly or adequately assessed.				
If you could shed more light on these two, what are you doing in terms of assessment for learning and assessment as learning.				
So our assessment for learning are mainly in the workbooks. There are various types of assessment for learning that we have in our way books.				
Through the Senate we were assisted to use so many electronic tools for assessment for learning. We have various software that we are using, to create word puzzles.				
There are so many reflective assessments in the workbooks.				
Some of the assessments for learning are on Moodle.				
In our clinical practice students use their checklist and their lookbooks as they observe each other practicing procedures.				
They videotape each other and give each other feedback as they practise how to present or how to take care of a patient using the computers and the video camera that are available in the simulation lab				
	ORGANIZATION (Strategies;Structure and Culture; Processes			

EXECERPTS		CODES	CATEGORIES	
Would you please describe for me the type of curriculum that you are using at your institution?				
So the type of curriculum that you're using it or institutions, is the competency based. Curriculum which is guided by 4 principles which are: constructivism; Scaffolding. Constructive alignment and authenticity		Use of the competency-based curriculum underpinned by 4 principles: constructivism, scaffolding, constructive alignment and authenticity	The competency-based curriculum	Competency-based
The curriculum is a learner centred curriculum where the learners take charge of their own learning to construct new knowledge, deconstruct the old knowledge, and construct the new knowledge, and are also guided by Study guides or workbooks that have got instructions and activities that the students are able to engage in the process of accumulating knowledge for themselves.		The curriculum is learner centered	Learner-centered curriculum	A learner-centered
From what you are saying, could you briefly say under Constructivism, I think I get that part. Could you talk more about constructive alignment, authenticity and scaffolding? What are you doing exactly?				
So, on constructive alignment we are basically structuring the curriculum using the Biggs theory of the constructive alignment triangle where we are saying learning outcomes in the curriculum, are aligned to determine the teaching and learning activities that are going to be carried out by the facilitators in class or in various learning platforms, and then that's also what we will link to the assessments that we will subject students to in order		Constructive alignment ensures alignment amongst learning outcome, teaching and learning	Principles of CBC	Alignment of asse

to measure whether they've attained the required competencies for each level,.		activities and assessment		
in authenticity our system is: our teaching and learning are carried out in authentic environments. Some of these authentic environments are communities where we send students to. This is where they will get their teaching and learning activities and also the assessments for their learning happen in those authentic environments		Teaching; learning and assessments are carried out in authentic environments	Principles of CBC	Assessment carried out
For scaffolding the curriculum is structured such that it supports the learning of the required content and skills and it builds up the student to say the student should understand what is happening in the community in the first year.		Students are given as much support as they require according to their competency	Principles of CBC	Scaffolding provided
In the first year, they have to understand how to take care of a patient at a Primary Health care center, where the patient from the community is referred to. And then from there in their final year they learn how to provide comprehensive nursing care to patients who are admitted in district, regional and referral hospitals.		Structure of the curriculum is from simple to complex	Structure of the curriculum	Assessment process
The structuring of the curriculum and the implementation of this same curriculum also followed the design down and deliver up approach where we first have to come up with the competence or the exit outcomes that we expect for this particular student		Structure and design of the curriculum	Structure of the curriculum	Structure of the curriculum

You design, the activities prior to any teaching, for example if this student is supposed to be able to provide comprehensive nursing care to a patient. What should this student learn? How will it be taught? And How will it be assessed? And then when we are implementing, then we implement going upward.		Design of the curriculum and its implementation	Design and implementation of the curriculum	Structure of the curriculum
From the teaching, what are we teaching? How are we going to assess and then are we going to be able to determine that this student has acquired that particular skill		Alignment between what is taught and what is assessed	Principles of the curriculum	Alignment of assessment with learning
How do we teach this student and when we look at how we teach, we also look at learning outcomes, to say was this the appropriate teaching and learning strategy that we use?		Alignment between learning outcome and what is taught	principles of the curriculum	Alignment of assessment with learning
Now we also look at the assessment part to say the learning outcome is for example provision of comprehensive care. Did we teach this student to be able to provide comprehensive care and how do we assess.		Alignment between learning outcome and assessment	principles of the curriculum	Alignment of assessment with learning
certain outcomes can be assessed in theory, but other outcomes really need to be assessed, in practical like when we are doing the OSCEs		Different methods of assessment according to the type of learning outcome	various methods of assessment	Matching assessment with learning
In the learning process, the authenticity part is students are exposed to real life learning situations where they are taken through the simulation.		Authentic environments for learning	principles of the curriculum	Assessment carried out in authentic environments
Prior to going to the clinical area they go through the real life situation as well as in the assessment assessment like for the practical assessment they do the OSCEs not in the clinical area but in the simulation lab with simulated situations and with standardized patients creating closer to real life		Authentic environments created during OSCEs in the simulation lab	Authenticity in practical assessments	Assessment carried out in authentic environments

situations which are used in the assessment, making sure that there is authenticity				
In scaffolding where the teaching and learning starts from the basics or the foundations, we build up until we get to the complex level, starting with the simplest going to the complex. So even the assessment, how we assess the first year is not the same way that we assess the second year is not the same way that we are going to assess the third year.		Assessments strategies and content differ according to the level of study	Assessment strategies per study level	Level of scaffolding
So there is that type of scaffolding where there assessing and determining whether the students still need support, supporting and reassessing.		Scaffolding and review to determine how much support to give to the student	principles of CBC	Assessment of lev
I want to know like in the last statement you talked about the way you assess first year would be different from the second and third. Can you correct my understanding would be like you are saying that when you assist a first year, then when you get to the second year you are building onto the assessment that was done in the first year. Are these assessments linked or they are far apart from each other?.				

The assessments are actually linked because we are building on from the basics like for example the first years when they go for clinical placement in the wards they do the basic nursing activities of daily living, so they will be doing the bed baths of patients, feeding patients, and the making of the beds observations like temperature and Bp are done. When it comes to the assessment, we are going to assess them on that. When they go to 2nd year we are not going to assess them on how they take the temperature but we know we expect them to be able to take the temperature so that will not really be the focus of our assessment.		Assessments build on top of each other according to year of study	Assessment per level of study	Implementation of
In 2nd year, because that is a primary healthcare, yeah, we are focusing on them consulting patients, examining the patient, making a decision to say what is this? I have checked the the vital signs and this patient is complaining about this. I think this patient is having this and maybe the management could be this. So that is at a much higher level than at the first year		Assessments get complex as one advances in years of study	Assessment per level of study	Implementation of
In third year, they are at the hospital level where they are taking care of those acute cases that are managed at the hospital and also managing patients who are having complicated conditions using a lot of hospital machinery, a patient who is maybe let's say who is having poor oxygen saturation? They have to be able to manage that so the assessment cannot be the same as in first year. That is how the assessments build up on each other.		Assessments get complex as one advances in years of study	Assessment per level of study	Implementation of
Do you have any guidelines with regard to how many assessments per semester theory and practical. Are you guided by any assessment document that you probably use? In OSCEs and clinic-based assessments, that's for practical and in theory, can we look at the different types of assessments that you use? So maybe we can break it down bit by bit to say how many assessments do you do per semester? Is there any guideline with regard to that?				

There are guidelines in the curriculum and the assessment policy in terms of the number of assessments that students should be engaged in per semester		The curriculum and assessment policy guide assessments	The assessment policy	Implementation and
The program of assessment also guides in terms of the levels of assessment in terms of the cognitive levels that we need to examine at different levels and the percentage which is the minimum percentage for the assessor to construct the various assessments that they are constructing for students		Programs of assessment document determines the cognitive levels to be assessed in the examinations	Programs of assessment	Implementation and
When it comes to the issues of, which other assessment methods do we use in the theory. We have theoretical tests that we are giving in classes. We are using the multiple choices where we might use some of the objective items like the true or false or the matching items and structured questions		Assessment methods in theory are multiple choice questions, True/False and matching questions	Assessment methods	Various types of a
We have also developed guidelines in terms of the use of portfolios to assess students in various modules, not all modules		Portfolios as an assessment method	Assessment methods	Various types of a
Students do online assessments and also online quizzes that we use for testing whether they have acquired the necessary theoretical knowledge.		Online quizzes and assignments used for assessing theoretical knowledge	Assessment methods	Various types of a
There is the use of the blueprint which also focuses on the learning outcomes and the different levels of cognition that are assessed.		The Blueprint also guides levels of cognition to be assessed according to	The Blueprint	Implementation and

		learning outcomes		
In the assessments, there is a focus on using the Bloom's taxonomy in determining the different levels that we are assessing which helps us to align our assessments with the learning outcome.		Bloom's taxanomy used to align with learning outcomes and what is to be assessed	Bloom's taxonomy	Implementation an
Can you briefly tell me how you integrate them to guide assessment because you have blueprints, you have a program of assessment, you have a policy, you have a curriculum. How do you integrate, how do they speak to each other to then guide the whole assessment process?				
The programs of assessment was developed as a recommendation from recent evidence that states that assessment in CBC should actually be by programmatic assessment. Not looking at singular points of assessment. So when we were developing the programs of assessment, we actually had the curriculum by the side. So we were looking at the curriculum in terms of the outcomes and then used the outcomes to say what type of an assessment can we use and at what level are we assessing.		Programs of assessment was developed in line with the curriculum	Development of programs of assessment	Processes followe
So the very same programs of assessment, at each level of the curriculum like the first year, second year, third year level there is also a blueprint for every semester which was designed to say how are we going to split the assessment in the content that is being assessed for each module or for each level so that the content of modules is spread across the semesters for example, pharmacology which has part 1 and 2 in order to avoid repetition and also missing out other topics		Incorporated in the programs of assessment are blueprints to align with modular outcomes	Development of programs of assessment	Alignment of docu

The other one is the assessment policy. When it was reviewed, it was reviewed in line with the demands and the requirements of competency-based education, so we had to change the assessment policy to match the requirements and the demands of the competency based curriculum that we had, also the demands that were are coming from the programs of assessment.		Development of the assessment policy incorporated requirements both from the curriculum and the programs of assessment	Development of the assessment policy	Alignment of documents
With the blueprint every module when we are doing the assessment, particularly the summative assessment, the assessment has to address the learning outcomes and also look at the amount of time that was spent on a specific theme in the module, and then determine how much of the questions will be in the assessment and also determine what percentage of questions will be of low cognition and what percentage will be of a high cognition.		Blueprints stipulate amount of questions per learning outcome and cognitive levels of the questions	Blueprints	Alignment of documents
In the programs of assessment. Do you have one assessment you do per year to say now this is 1 assessment that covers everything for each year for you to proceed to the next year?				
No, not necessarily one. They are many summative assessments for each module.		There is not one final summative assessment per module	Multiple points of assessment	Programs of assessment
The other factor that determines how many assessment points will be there will also be the weight of the module. We have modules that are quite so small that they take half a semester so much as you may have wanted to assess this student, maybe at three or four different points the content does not.		Number of assessment points per module depend on the weight contribution of module in the curriculum	Adequate amount of points of assessment	The curriculum and assessment

allow, but at the minimum you find that there will be 2 continuous assessments which go to the summative assessment but in between there will be quizzes and the assignments for formative assessment. But then you also have the modules that are heavier. The modules that are heavier You may find that the student experiences not less than two assessments in the course of the semester and the module. Those assessments will also depend on how much content has been covered, which is being assessed and what are the learning outcomes that are being focused on.		Number of assessment points will depend on amount of content covered in class	Adequate amount of points of assessment	The curriculum an
Now let's come to the educators themselves. What role do they play with regard to assessment? And also kindly share their capabilities in terms of conducting assessments or meeting these assessment expectations of competency-based education.				
So the role of the educator in as much as they are facilitators in the process of the teaching and learning. They also are involved in formulating the assessment items marking of the assessments and also doing the item analysis and writing reports afterwards.				
Every semester before assessment time, the summative assessment time approaches, all the educators are exposed to or are subjected to capacity building workshops and orientation or reorientation for those that are already in the system		All educators attend capacity building workshop on assessment as a refresher or orientation for starters	Assessment capacity building workshops	Schedules of asse
No educator goes into the setting of assessment without the capacitation workshops on how to do assessment,		Assessment capacitation workshops are mandatory	Assessment capacity building workshops	Mandatory assess

In the workshop there is a refresher on what is essentially assessment, different types of assessments why assessments are done; what are the principles of the best or a good assessment and what is their role?		The content of the assessment workshops	Assessment capacity building workshops	Content of assessment
In the workshops the educators are also reminded that in the teaching, learning process, students will come up with so much information, some of which may not be in the popular books. The educator may not be aware of it so we need to validate such information and be able to say OK this is a valid information from a valid source. In that case they need to extend the marking memo so as to include the new information from the students answers		In the workshops educators are reminded on the importance of developing and extending the marking memo	Content of the assessment workshops	Content of assessment
For the practical assessment. like for the OSCEs they still have to go through orientation or training on how to do an OSCE; what is expected of them and how the OSCEs are run and what is their role in the running of the OSCEs..		Workshops on practical assessment using OSCE are held before practical exams	Workshops on practical examinations	Schedules of assessment
They are also trained on their role in training standardised patients in the OSCEs		Educators are trained on how to train standardized patients	Roles of educators	Educators trained
For these capacity development programs, do you use local expertise or do you outsource by local I mean from the institution, the stuff that you have with the institution or do you also outsource external expertise in terms of these capacitation programs?				
No, we are we are using the local expertise				
Capitation usually begins at the beginning of the semester, where we capacitate staff on implementation of assessment in each module and we also capacitate staff towards the final examinations.		Capacity building in assessment begins at the beginning of the semester to the end	Timing of capacity building workshops	Schedules of assessment

Initially, we had some external capacitation from the affiliator but now we have been using the local expertise because they are really knowledgeable about the context and the challenges in the context.				
They know the challenges that each facilitator might be actually having, and who is new in the system; Who is old in the system? Who do we need to engage now, or do we need to engage all the people or we are actually setting aside this workshop for certain people that are have to assess a module with a method which is different from others.				
The institution also has a established the Faculty development office, The office is actively involved in the CAPACITATION or the orientation of all the educators in the institution, not necessarily on the assessments only, but also other aspects of capacitation. But during the assessment, yes, that is one of the roles of that particular office		The faculty development office is responsible for capacity building in the school	Key offices in the institution	Strategy for faculty
How do you monitor the assessments? What plans do you have in terms of monitoring assessments?				
One of the tools that we have, is the academic master plan which has highlighted all the activities for that particular academic year and when assessments are supposed to be conducted. And then we also have an assessment activity plan which outlines when assessments are supposed to be set by what time when they're supposed to have gone for internal moderation when they're supposed to go for external moderation, and when the corrections have to be done, and the submitted for printing at the coordinating office in Maseru		A masterpaln is always in place to monitor closely school activities including assessments	Monitoring of academic activities	Academic masterp
Assessments are conducted at the time according to the activity plan.		Assessments follow the masterplan	Monitoring of assessment activities	Activity plan to mo

We have the office of the Head of academics and we also have the Academic committee which are actively engaged in the academic activities and also keep a track record of the teaching and learning as well as assessment.		The office of the Academic head and academic committee keep track of academic activities	Key offices in the institution	Internal strategy for
Before assessment are administered to students, whether formative or summative, in every module, every assessment has to be moderated internally as a quality measure and then corrections are done and then assessment administered.		All assessments formative and summative have to be moderated	Moderation process	Quality assurance
We also have adherence to the assessment policy, which also determines how assessments are supposed to be done, all the educators are knowledgeable about the assessment policy and how assessments are supposed to be conducted.		Every educator is knowledgeable of the assessment policy which guides assessment	Assessment policy	Assessment policy
The Academic committee is there to oversee the issues of assessment internally, and it's the one that actually appoints internal moderators for each module, And also issues of mentoring of junior assessors before they are left to start assessing on their own		The Academic committee oversees assessment implementation and the assignment of module moderators,	Role of the Academic committee	Strategy for monitoring
Academic committee, there's the Senate. So the academic Senate oversees, all the summative assessments.		The Senate oversees the implementation of summative assessments	Role of the Senate	External stakeholders

We make the assessment activity plan that is submitted to Senate at the beginning of every academic year to say this is how we are going to assess and these are the activities related to assessment and		An assessment activity plan is submitted to the Senate at the beginning of the academic year	Monitoring of assessment activities	External stakeholders
the Academic Senate gives oversight and also advice to say in terms of your assessment here how about you change it for the next academic year.		Academic senate gives input in assesment implementation	Monitoring of assessment activities	External stakeholders
If I may get this clear, the Senate is it's made up of experts with regard to assessment.				
Yes, the Senate is made up of various people, and then there are people who are having qualifications in Health Sciences education assessments. There are two people who are give us oversight in terms of assessment of theoretical outcomes, and then also the practical outcome. There's also some two experts who were recruited because of their expertise in practical assessments		The composition of the Senate: people with qualifications in Health Sciences Education assesment; experts in clinical practice and theory	The composition and expertise of senate members	Appropriately qualified
If I get it clear in terms of your structure, maybe you can fill in. I see there's there's ahead of academic affairs. Then there's an academic committee. Then there is a Senate. Who is above the Senate and also who are the other people below the academic committee?				
the Academic committee is made up of the heads of programs; the deputy principal; the Quality assurance officer, the clinical supervisor and the Faculty Development Officer.		The structure of the Academic Committee	Composition of the Academic Committee.	Diversity of the int

the heads of programs, bring to their academic committee, issues related to assessment in their programs even issues of remedial remediations that are being done, or students who are identified as struggling, struggling in terms of their assessments or their learning.		The organizational communication s lines in terms of teaching, learning and assessment	The organizational structure	Transparent intern
When they bring this to the academic committee, the academic committee, take them to the management before they are taken up to the Senate disgusted Senate, if it is a matter that needs to be discussed at the level of the Senate.		The organizational communication s lines in terms of teaching, learning and assessment	The organizational structure	Transparent intern
In the Academic Senate is a committee called the EXCO (examination committee) which is made-up of people who are experts in assessments.		The organization of the Senate	The Senate	Appropriately qua
There are four people who are experts in assessment. They're the ones that sit, with the school representatives to discuss student results and to discuss issues related to assessments on a scheduled date and approve results which then will be published at the school.		Roles and functions of the EXCO in assessments	Role of the EXCO	External stakehol
In terms of the organogram we have the Proprietor below which is the school board and then below the school board, we have the Senate and below the Senate, we have the management and below the management we have the academic committee.		The structure of the institutional organogram	The organogram	The organogram v
And the board and the proprietor are not involved in assessments?				
No				
What technological infrastructure do you have available to support assessment for both theory and practical?				

Starting with practical assessment we have the simulation which is equipped with different levels of fidelity of mannequins. We have high fidelity mannequins. We have medium and we have low fidelity mannequins which are used in the different levels of assessment depending on the program and also the exit level outcomes that we are assessing				
We have a a learning management system which is the Moodle. On the Moodle students are able to undertake different types of assessments, quizzes, and assignments				
This Moodle platform is dependent on the Internet. So the institution also has an availability of Internet which is accessible to all students and educators				
Although sometimes technology can let us down, so our students have access to data other than do Wi-Fi connectivity as well as the educators.				
In terms of ongoing assessment, they can do assessments online formatively using the Moodle platform, although we have not used it for summative, assessments				
The school has a physical server installed in one of the offices to which school office computers for most educators are connected.				
We usually retrieve some of the assessments from the server. When educators set assessments from their desktops they have to protect them using passwords.				
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At some point there was some talk we were supposed to receive some training for all the educators in terms of the Moodle learning management system but also in terms of using the platform as an assessment platform. But then the issues of funds				
However, there are still plans in the Faculty Development Unit where there is a program that has been developed with different capacitation activities, or areas where we need more capacitation. So that is one of the areas maybe in this financial year, since the budget is available we can get capacitation, maybe get expertise from outside to come and help us see how best we can still use the learning management system.				
To what extent are you using evidence based processes to guide your assessment? And I want this answer to be responded probably in two ways, #1. Are you using evidence to guide what you are doing? Then #2? Are you generating evidence from what you are doing that you can also then share with others that we are doing this because it's working in our system.				
Yes, we are using evidence. When the competency based curriculum came, it really demanded the use of a lot of evidence.		The CBC demands use of evidence based practices	Use of evidence based practises	Use of evidence-b

We have been attending some of the webinars in terms of assessment. I think there are so many webinars every month that we are attending that we are linked with our senators because our senators in the assessment, when they identify some problems in terms of where we are lacking new evidence, they usually refer us to someone who can capacitate us or they can capacitate us themselves or they link us to a webinar which can capacitate us				
We have been having some benchmarking activities as well.				
We have also been a given some materials to actually read their about evidence regarding the OSCE testing language. We have been given some recent articles which were arguing about the validity of some of the testing especially during the COVID-19 pandemic where we had to do online practical tests				
We usually invite 2 preceptors for our final summative assessments to be part of the examination. We make sure that these people come from the clinical area where they are implementing evidence in terms of patient care				
They usually advise us on our assessment checklists on what steps will be missing or what needs to be changed according to evidence. I think 123 steps are missing in terms of the current evidence that we're having from the clinic or area. And then we have to make amends in order to align to evidence and pedagogical evidence.		The preceptors from the clinical area give advise on checklist development according to current practices	Development of checklists	External stakeholders
We also engage in academic conferences. One of them is SAAHE. Every year we participate in that and we gather a lot of evidence in relation to the teaching and learning practices and also in terms of assessment as well as keeping abreast of what is prevailing.		The institution keeps abreast with international practices by attending	keeping abreast with international practices	Engaging with external stakeholders

		international conferences like SAAHE		
We have generated some evidence, it may not be a lot of evidence, but they have been I think some few papers that have been published a there has been a paper that has been published relating to scaffolding and		A sizeable amount of research output has been produced	Institutional research output	Institutional research
A recent one which talked to the fidelity of implementing a competence-based curriculum during the a disruption and the issue of assessment is actually very well addressed there because that is the time we learned how we wish we could be able to assess students effectively using the electronic platform, but we don't didn't have that capacity and that one actually came out in this paper to say much as the constructive alignment and the scaffolding and the authenticity were emphasized progression was not well sequenced because now we couldn't assess students much as they learnt things a long time ago		Research output on specific topics	Institutional research output	Institutional research
How well are the nurse educators empowered in terms of publishing their work that you are doing in competence-based curriculum?				
I think that one is it There is still has quite a gap. Not many Educators are interested in research. They feel that it is difficult.		Less interest in assessment research among educators	Less assessment research interest in the school	Limited capability
We have the potential of capacitating more because among the senators we have also some research experts that have already started giving some capacitation in terms of supervising students.		Available potential to build assessment research capacity since The Senate is training	The Senate's role in building assessment research capacity	External stakeholders

		educators on supervising student research		
The Research committee in the school is planning to bring everybody on board and you really visit this research aspect and see how many people we can bring on board so that they can also be engaged in the research activities?		The Research Committee plans on building research capacity among educators	Research Committee's commitment to building research capacity	Dedicated internal
There is a budget for capacitation on research and also producing research in itself as an institution. We have developed a research agenda which is addresses a lot of academic issues with assessment as one of the major ones, but also we have added issues of governance and the administrative aspect to it.		Assessment is included in the budget for research and the research agenda for the institution	Budget for research	Dedicated budget
What is your research agenda with regard to the work that you are doing? Do you have any specific research agenda with regard to the implementation of competence based curriculum?				
Our research agenda addresses competence based curriculum issues around community based education; clinical teaching; assessment; theoretical teaching.		Assessment is included in the research agenda of the school	The research agenda	Assessment as pa
We have been trying to work in collaborations so that the impact of our research output becomes big.		The school has collaborations with external researchers to increase impact of reserach output	International collaborations in research	External stakeholc
We are still having our budget approved for support of research in terms of conferences, and research		Budget available for	Budget for research	Dedicated budget

		research and conferences		
how do you ensure issues of validity, reliability and feasibility of the assessments that you give?				
Feasibility in practical examinations is tested by us inviting some staff members from the clinical area to the school of nursing; that is after the exams have been moderated. We test the stations in terms of their feasibility in terms of time and feasibility in terms of the resources that are there and what is expected to be done		The practical examinations are piloted in the school for feasibility	Feasibility of assessments	External stakeholders
This has also assisted to review our blueprint		Blueprints are reviewed	reliability of assessments	Blueprints in reliability
As a result we have managed to determine things that will be examined using OSCEs. These are limited to tasks that we know we can do with a standardized patient or we can do with a high-fidelity manikin or a task trainer. The rest have been set aside for examining the students as Directly observed practicals.		OSCEs are for skills to be done with standardized patients only	Methods of assessments	Assessment methods
In terms of the authenticity, we have some of the modules that do not have a written paper like our community module in first year. The student has to go to the real community where they are observed as they interact with real people When they come back, they prepare a portfolio which is their final examination in their presentation.		Type of module content determines the authentic assessment method to be used.	Authenticity and assessment methods	Authenticity in assessment
We are also learning in terms of assessments in competence based curriculum that assessment is actually resource intensive as opposed to the old curriculum		CBC is expensive to implement	Cost of CBC implementation	Cost of implementation

In the old curriculum for their practicum, there will be assessed on 2 procedures, which were not even standardized. One could do a temperature, the other one an injection. They both pass or one passes, and the other one fails. So there wasn't that standardization of assessment,		Non-standardized assessments in the previous curriculum	Comparison of assessment between the old curriculum and CBC	Comparison between
But now that we are using the competence based curriculum and OSCEs all these students are exposed to the same situations and same questions and same everything.		CBC has standardized assessment for all students	Comparison of assessment between the old curriculum and CBC	Comparison between
As result assessment has become much fairer.		Hence assessments have become fair	Comparison of assessment between the old curriculum and CBC	Comparison between
But there's a lot of resources that are needed to be put in and sometimes you find that when resources are limited, people will cut corners and maybe may not even assess students fully or comprehensively		Due to the high resource intensity of assessment in CBC assessment is not properly done	Implications of the cost of CBC implementation	Cost of implement
You find that in some institutions they will even say no, we are not putting 10 stations, we will just use five stations and that is a summative assessment. And if you look at the learning outcome that we are trying to assess, the learning outcome hasn't really been fairly or adequately assessed.		Cutting down on stations in OSCE to cut down costs leads to under assessment of students	Implications of the cost of CBC implementation	Cost of implement
If you could shed more light on these two, what are you doing in terms of assessment for learning and assessment as learning.				
So our assessment for learning are mainly in the workbooks. There are various types of assessment for learning that we have in our way books.		Workbooks contain assessment for	Assessment and workbooks	Various types of a

		learning activities		
Through the Senate we were assisted to use so many electronic tools for assessment for learning. We have various software that we are using, to create word puzzles.				
There are so many reflective assessments in the workbooks.		Workbooks contain assessment for learning activities	Assessment and workbooks	Various types of a
Some of the assessments for learning are on Moodle.				
In our clinical practice students use their checklist and their logbooks as they observe each other practicing procedures.		Students use checklists and logbooks to practise skills	Checklists	Documents used t
They videotape each other and give each other feedback as they practise how to present or how to take care of a patient using the computers and the video camera that are available in the simulation lab				
	TECHNOLOGY (Infrastructure; development capabilities)			
EXERCEPTS		CODES	CATEGORIES	
Would you please describe for me the type of curriculum that you are using at your institution?				

So the type of curriculum that you're using it or institutions, is the competency based. Curriculum which is guided by 4 principles which are: constructivism; Scaffolding. Constructive alignment and authenticity				
The curriculum is a learner centred curriculum where the learners take charge of their own learning to construct new knowledge, deconstruct the old knowledge, and construct the new knowledge, and are also guided by Study guides or workbooks that have got instructions and activities that the students are able to engage in the process of accumulating knowledge for themselves.				
From what you are saying, could you briefly say under Constructivism, I think I get that part. Could you talk more about constructive alignment, authenticity and scaffolding? What are you doing exactly?				
So, on constructive alignment we are basically structuring the curriculum using the Biggs theory of the constructive alignment triangle where we are saying learning outcomes in the curriculum, are aligned to determine the teaching and learning activities that are going to be carried out by the facilitators in class or in various learning platforms, and then that's also what we will link to the assessments that we will subject students to in order to measure whether they've attained the required competencies for each level,.				
in authenticity our system is: our teaching and learning are carried out in authentic environments. Some of these authentic environments are communities where we send students to. This is where they will get their teaching and learning activities and also the assessments for their learning happen in those authentic environments				

For scaffolding the curriculum is structured such that it supports the learning of the required content and skills and it builds up the student to say the student should understand what is happening in the community in the first year.				
In the first year, they have to understand how to take care of a patient at a Primary Health care center, where the patient from the community is referred to. And then from there in their final year they learn how to provide comprehensive nursing care to patients who are admitted in district, regional and referral hospitals.				
The structuring of the curriculum and the implementation of this same curriculum also followed the design down and deliver up approach where we first have to come up with the competence or the exit outcomes that we expect for this particular student				
You design, the activities prior to any teaching, for example if this student is supposed to be able to provide comprehensive nursing care to a patient. What should this student learn? How will it be taught? And How will it be assessed? And then when we are implementing, then we implement going upward.				
From the teaching, what are we teaching? How are we going to assess and then are we going to be able to determine that this student has acquired that particular skill				
How do we teach this student and when we look at how we teach, we also look at learning outcomes, to say was this the appropriate teaching and learning strategy that we use?				
Now we also look at the assessment part to say the learning outcome is for example provision of comprehensive care. Did we teach this student to be able to provide comprehensive care and how do we assess.				

certain outcomes can be assessed in theory, but other outcomes really need to be assessed, in practical like when we are doing the OSCEs				
In the learning process, the authenticity part is students are exposed to real life learning situations where they are taken through the simulation.				
Prior to going to the clinical area they go through the real life situation as well as in the assessment assessment like for the practical assessment they do the OSCEs not in the clinical area but in the simulation lab with simulated situations and with standardized patients creating closer to real life situations which are used in the assessment, making sure that there is authenticity				
In scaffolding where the teaching and learning starts from the basics or the foundations, we build up until we get to the complex level, starting with the simplest going to the complex. So even the assessment, how we assess the first year is not the same way that we assess the second year is not the same way that we are going to assess the third year.				
So there is that type of scaffolding where there assessing and determining whether the students still need support, supporting and reassessing.				
I want to know like in the last statement you talked about the way you assess first year would be different from the second and third. Can you correct my understanding would be like you are saying that when you assist a first year, then when you get to the second year you are building onto the assessment that was done in the first year. Are these assessments linked or they are far apart from each other?.				

The assessments are actually linked because we are building on from the basics like for example the first years when they go for clinical placement in the wards they do the basic nursing activities of daily living, so they will be doing the bed baths of patients, feeding patients, and the making of the beds observations like temperature and Bp are done. When it comes to the assessment, we are going to assess them on that. When they go to 2nd year we are not going to assess them on how they take the temperature but we know we expect them to be able to take the temperature so that will not really be the focus of our assessment.				
In 2nd year, because that is a primary healthcare, yeah, we are focusing on them consulting patients, examining the patient, making a decision to say what is this? I have checked the the vital signs and this patient is complaining about this. I think this patient is having this and maybe the management could be this. So that is at a much higher level than at the first year				
In third year, they are at the hospital level where they are taking care of those acute cases that are managed at the hospital and also managing patients who are having complicated conditions using a lot of hospital machinery, a patient who is maybe let's say who is having poor oxygen saturation? They have to be able to manage that so the assessment cannot be the same as in first year. That is how the assessments build up on each other.				
Do you have any guidelines with regard to how many assessments per semester theory and practical. Are you guided by any assessment document that you probably use? In OSCEs and clinic-based assessments, that's for practical and in theory, can we look at the different types of assessments that you use? So maybe we can break it down bit by bit to say how many assessments do you do per semester? Is there any guideline with regard to that?				

There are guidelines in the curriculum and the assessment policy in terms of the number of assessments that students should be engaged in per semester				
The program of assessment also guides in terms of the levels of assessment in terms of the cognitive levels that we need to examine at different levels and the percentage which is the minimum percentage for the assessor to construct the various assessments that they are constructing for students				
When it comes to the issues of, which other assessment methods do we use in the theory. We have theoretical tests that we are giving in classes. We are using the multiple choices where we might use some of the objective items like the true or false or the matching items and structured questions				
We have also developed guidelines in terms of the use of portfolios to assess students in various modules, not all modules				
Students do online assessments and also online quizzes that we use for testing whether they have acquired the necessary theoretical knowledge.				
There is the use of the blueprint which also focuses on the learning outcomes and the different levels of cognition that are assessed.				
In the assessments, there is a focus on using the Bloom's taxonomy in determining the different levels that we are assessing which helps us to align our assessments with the learning outcome.				
Can you briefly tell me how you integrate them to guide assessment because you have blueprints, you have a program of assessment, you have a policy, you have a curriculum. How do you integrate, how do they speak to each other to then guide the whole assessment process?				

The programs of assessment was developed as a recommendation from recent evidence that states that assessment in CBC should actually be by programmatic assessment. Not looking at singular points of assessment. So when we were developing the programs of assessment, we actually had the curriculum by the side. So we were looking at the curriculum in terms of the outcomes and then used the outcomes to say what type of an assessment can we use and at what level are we assessing.				
So the very same programs of assessment, at each level of the curriculum like the first year, second year, third year level there is also a blueprint for every semester which was designed to say how are we going to split the assessment in the content that is being assessed for each module or for each level so that the content of modules is spread across the semesters for example, pharmacology which has part 1 and 2 in order to avoid repetition and also missing out other topics				
The other one is the assessment policy. When it was reviewed, it was reviewed in line with the demands and the requirements of competency-based education, so we had to change the assessment policy to match the requirements and the demands of the competency based curriculum that we had, also the demands that were are coming from the programs of assessment.				
With the blueprint every module when we are doing the assessment, particularly t summative assessment, the assessment has to address the learning outcomes and also look at the amount of time that was spent on a specific theme in the module, and then determine how much of the questions will be in the assessment and also determine what percentage of questions will be of low cognition and what percentage will be of a high cognition.				

In the programs of assessment. Do you have one assessment you do per year to say now this is 1 assessment that covers everything for each year for you to proceed to the next year?				
No, not necessarily one. They are many summative assessments for each module.				
The other factor that determines how many assessment points will be there will also be the weight of the module. We have modules that are quite so small that they take half a semester so much as you may have wanted to assess this student, maybe at three or four different points the content does not.				
allow, but at the minimum you find that there will be 2 continuous assessments which go to the summative assessment but in between there will be quizzes and the assignments for formative assessment. But then you also have the modules that are heavier. The modules that are heavier You may find that the student experiences not less than two assessments in the course of the semester and the module. Those assessments will also depend on how much content has been covered, which is being assessed and what are the learning outcomes that are being focused on.				
Now let's come to the educators themselves. What role do they play with regard to assessment? And also kindly share their capabilities in terms of conducting assessments or meeting these assessment expectations of competency-based education.				
So the role of the educator in as much as they are facilitators in the process of the teaching and learning. They also are involved in formulating the assessment items marking of the assessments and also doing the item analysis and writing reports afterwards.				

Every semester before assessment time, the summative assessment time approaches, all the educators are exposed to or are subjected to capacity building workshops and orientation or reorientation for those that are already in the system				
No educator goes into the setting of assessment without the capacitation workshops on how to do assessment,				
In the workshop there is a refresher on what is essentially assessment, different types of assessments why assessments are done; what are the principles of the best or a good assessment and what is their role?				
In the workshops the educators are also reminded that in the teaching, learning process, students will come up with so much information, some of which may not be in the popular books. The educator may not be aware of it so we need to validate such information and be able to say OK this is a valid information from a valid source. In that case they need to extend the marking memo so as to include the new information from the students answers				
For the practical assessment. like for the OSCEs they still have to go through orientation or training on how to do an OSCE; what is expected of them and how the OSCEs are run and what is their role in the running of the OSCEs..				
They are also trained on their role in traing standardised patients in the OSCEs				
For these capacity development programs, do you use local expertise or do you outsource by local I mean from the institution, the stuff that you have with the institution or do you also outsource external expertise in terms of these capacitation programs?				
No, we are we are using the local expertise				

Capitation usually begins at the beginning of the semester, where we capacitate staff on implementation of assessment in each module and we also capacitate staff towards the final examinations.				
Initially, we had some external capacitation from the affiliator but now we have been using the local expertise because they are really knowledgeable about the context and the challenges in the context.				
They know the challenges that each facilitator might be actually having, and who is new in the system; Who is old in the system? Who do we need to engage now, or do we need to engage all the people or we are actually setting aside this workshop for certain people that are have to assess a module with a method which is different from others.				
The institution also has a established the Faculty development office, The office is actively involved in the CAPACITATION or the orientation of all the educators in the institution, not necessarily on the assessments only, but also other aspects of capacitation. But during the assessment, yes, that is one of the roles of that particular office				
How do you monitor the assessments? What plans do you have in terms of monitoring assessments?				
One of the tools that we have, is the academic master plan which has highlighted all the activities for that particular academic year and when assessments are supposed to be conducted. And then we also have an assessment activity plan which outlines when assessments are supposed to be set by what time when they're supposed to have gone for internal moderation when they're supposed to go for external moderation, and when the corrections have to be done, and the submitted for printing at the coordinating office in Maseru				
Assessments are conducted at the time according to the activity plan.				

We have the office of the Head of academics and we also have the Academic committee which are actively engaged in the academic activities and also keep a track record of the teaching and learning as well as assessment.				
Before assessment as are administered to students, whether formative or summative, in every module, every assessment has to be moderated internally as a quality measure and then corrections are done and then assessment administered.				
We also have adherence to the assessment policy, which also determines how assessments are supposed to be done, all the educators are knowledgeable about the assessment policy and how assessments are supposed to be conducted.				
The Academic committee is there to oversee the issues of assessment internally, and it's the one that actually appoints internal moderators for each module, And also issues of mentoring of junior assessors before they are left to start assessing on their own				
Academic committee, there's the Senate. So the academic Senate oversees, all the summative assessments.				
We make the assessment activity plan that is submitted to Senate at the beginning of every academic year to say this is how we are going to assess and these are the activities related to assessment and				
the Academic Senate gives oversight and also advice to say in terms of your assessment here how about you change it for the next academic year.				
If I may get this clear, the Senate is it's made up of experts with regard to assessment.				

Yes, the Senate is made up of various people, and then there are people who are having qualifications in Health Sciences education assessments. There are two people who are give us oversight in terms of assessment of theoretical outcomes, and then also the practical outcome. There's also some two experts who were recruited because of their expertise in practical assessments				
If I get it clear in terms of your structure, maybe you can fill in. I see there's there's ahead of academic affairs. Then there's an academic committee. Then there is a Senate. Who is above the Senate and also who are the other people below the academic committee?				
the Academic committee is made up of the heads of programs; the deputy principal; the Quality assurance officer, the clinical supervisor and the Faculty Development Officer.				
the heads of programs, bring to their academic committee, issues related to assessment in their programs even issues of remedial remediations that are being done, or students who are identified as struggling, struggling in terms of their assessments or their learning.				
When they bring this to the academic committee, the academic committee, take them to the management before they are taken up to the Senate disgusted Senate, if it is a matter that needs to be discussed at the level of the Senate.				
In the Academic Senate is a committee called the EXCO (examination committee) which is made-up of people who are experts in assessments.				
There are four people who are experts in assessment. They're the ones that sit, with the school representatives to discuss student results and to discuss issues related to assessments on a scheduled date and approve results which then will be published at the school.				

In terms of the organogram we have the Proprietor below which is the school board and then below the school board, we have the Senate and below the Senate, we have the management and below the management we have the academic committee.				
And the board and the proprietor are not involved in assessments?				
No				
What technological infrastructure do you have available to support assessment for both theory and practical?				
Starting with practical assessment we have the simulation which is equipped with different levels of fidelity of mannequins. We have high fidelity mannequins. We have medium and we have low fidelity mannequins which are used in the different levels of assessment depending on the program and also the exit level outcomes that we are assessing		The simulation lab is fully equipped	Simulation laboratory	Available physical
We have a a learning management system which is the Moodle. On the Moodle students are able to undertake different types of assessments, quizzes, and assignments		Available learning management system: Moodle for assessments	Available learning management system (LMS)	Infrastructure for c
This Moodle platform is dependent on the Internet. So the institution also has an availability of Internet which is accessible to all students and educators		Accessible and available internet for students and educators	Available internet	Infrastructure for c
Although sometimes technology can let us down, so our students have access to data other than do Wi-Fi connectivity as well as the educators.		Students are given data in case of Wi-Fi connection failure	Available software and hardware resources	Infrastructure for c
In terms of ongoing assessment, they can do assessments online formatively using the Moodle platform, although we have not used it for summative, assessments		Moodle platform has only been used	Available software	Infrastructure for c

		for formative assessments		
The school has a physical server installed in one of the offices to which school office computers for most educators are connected.		Physical server installed in the school	Available software and hardware resources	Infrastructure for c
We usually retrieve some of the assessments from the server. When educators set assessments from their desktops they have to protect them using passwords.		Password protection of assessments saved on the server	Storage of assessments	security for online
We also have an online cloud server through the departmental emails. Each department has its own email address where assessments are uploaded into a cloud.		Available are online departmental cloud servers	Available software and hardware resources	Infrastructure for c
We send password protected summative assessments electronically for external moderation.		Password protected summative assessments are sent to external moderators electronically	Security of online assessments	Cybersecurity for a
The marks that the students obtain from their continuous assessments and also from their final assessments, are entered into the FEDENA system. FEDENA is an electronic system that calculates the final grade.		FEDENA is an online system that is available for management of final assessments	Available online platforms	Infrastructure for c
Transcripts are also printed from the FEDENA system since it holds all the academic information for each student from their first year of study to the end of their study.		FEDENA is used for storage of students academic records	Available online platforms	Infrastructure for c

Recently we have acquired an audio visual system in the simulation lab. The moderator or some of the examiners can actually be marking the student in real time away from the student		An audio-visual system installed in simulation lab for examiners and moderators during practical assessments	Available software and hardware resources	Resource to enhance
We have first years portfolios and the midwives research presentations, that are done remotely from the external examiner. Students are recorded while presenting their work for their summative assessment at the school. The recorded presentations are then shared with the external electronically.		Portfolios and research presentations are recorded and sent to moderators electronically	Available online platforms	Available electronic
What developmental capacity do you have with regard to developing a technology related to assessment? Like software development or maximizing the use of learning management systems in terms of assessments, even those simulation. What capacity do we have to further develop those things you have and improve them.				
We cannot really say we have a lot of capacity. We are still in our infancy. There were some workshops and webinars which were being advertised but we didn't manage to attend. But there is room for improvement in such areas.		Room is available for capacity building in technology use despite training workshops and webinars attended	Room to improve technological capabilities	Capacity for educational
In terms of the Google applications, we've managed to take the Google forms for some of the assessments when students are in remote areas for their learning, where we were giving them some quizzes and then they record them for self-testing in terms of their clinical engagement.		Google forms have been used for remote assessments of students	Online assessment	eAssessment

Some use the Google forms to evaluate their learning in the clinical placements before the placement period comes to an end so that we are identify their challenges and address them before they lose much time		Students use the Google forms to evaluate their progress in clinical placements	Use of software in learning	Access to open o
Covid 19 really showed us that we still have limitations in terms of using electronic assessment strategies. We are under utilizing our LMS.		Limited capacity in electronic assessments	Low capabilities in electronic assessments	Low capabilities in
At some point there was some talk we were supposed to receive some training for all the educators in terms of the Moodle learning management system but also in terms of using the platform as an assessment platform. But then the issues of funds		Funding is the limiting factor in building capacity	Funding is limiting factor	financial limitation
However, there are still plans in the Faculty Development Unit where there is a program that has been developed with different capacitation activities, or areas where we need more capacitation. So that is one of the areas maybe in this financial year, since the budget is available we can get capacitation, maybe get expertise from outside to come and help us see how best we can still use the learning management system.		Plans available in the Faculty Development Unit to build technological capacity since funding has been availed	Plans to increase technological capacity	Financial resource
To what extent are you using evidence based processes to guide your assessment? And I want this answer to be responded probably in two ways, #1. Are you using evidence to guide what you are doing? Then #2? Are you generating evidence from what you are doing that you can also then share with others that we are doing this because it's working in our system.				
Yes, we are using evidence. When the competency based curriculum came, it really demanded the use of a lot of evidence.		Institution uses research evidence in teaching;	Use of evidence-based practices	Organisational cul

		learning and assessment		
We have been attending some of the webinars in terms of assessment. I think there are so many webinars every month that we are attending that we are linked with our senators because our senators in the assessment, when they identify some problems in terms of where we are lacking new evidence, they usually refer us to someone who can capacitate us or they can capacitate us themselves or they link us to a webinar which can capacitate us		The Senators hold capacity webinars or refer the institution to external people for new knowledge on assessment	The Senate in increasing assessment knowledge capacity	External stakeholders
We have been having some benchmarking activities as well.		Benchmarking activities have been engaged to build capacity	Benchmarking exercises	Organizational strategies
We have also been given some materials to actually read their about evidence regarding the OSCE testing language. We have been given some recent articles which were arguing about the validity of some of the testing especially during the COVID-19 pandemic where we had to do online practical tests		Senate gives reading materials to educators on assessment	The Senate in increasing assessment knowledge capacity	External stakeholders
We usually invite 2 preceptors for our final summative assessments to be part of the examination. We make sure that these people come from the clinical area where they are implementing evidence in terms of patient care		Preceptors from the clinical practise are incorporated as quality controllers during development of clinical assessments for their input	Preceptors in the development of clinical assessments	External stakeholders

They usually advise us on our assessment checklists on what steps will be missing or what needs to be changed according to evidence. I think 123 steps are missing in terms of the current evidence that we're having from the clinic or area. And then we have to make amends in order to align to evidence and pedagogical evidence.		The Preceptors contribute in development of checklists with current practise knowledge	Preceptors in the development of clinical assessments	External stakeholders
We also engage in academic conferences. One of them is SAAHE. Every year we participate in that and we gather a lot of evidence in relation to the teaching and learning practices and also in terms of assessment as well as keeping abreast of what is prevailing.				
We have generated some evidence, it may not be a lot of evidence, but they have been I think some few papers that have been published a there has been a paper that has been published relating to scaffolding and				
A recent one which talked to the fidelity of implementing a competence-based curriculum during the a disruption and the issue of assessment is actually very well addressed there because that is the time we learned how we wish we could be able to assess students effectively using the electronic platform, but we don't didn't have that capacity and that one actually came out in this paper to say much as the constructive alignment and the scaffolding and the authenticity were emphasized progression was not well sequenced because now we couldn't assess students much as they learnt things a long time ago				
How well are the nurse educators empowered in terms of publishing their work that you are doing in competence-based curriculum?				
I think that one is it There is still has quite a gap. Not many Educators are interested in research. They feel that it is difficult.				

We have the potential of capacitating more because among the senators we have also some research experts that have already started giving some capacitation in terms of supervising students.				
The Research committee in the school is planning to bring everybody on board and you really visit this research aspect and see how many people we can bring on board so that they can also be engaged in the research activities?				
There is a budget for capacitation on research and also producing research in itself as an institution. We have developed a research agenda which is addresses a lot of academic issues with assessment as one of the major ones, but also we have added issues of governance and the administrative aspect to it.				
What is your research agenda with regard to the work that you are doing? Do you have any specific research agenda with regard to the implementation of competence based curriculum?				
Our research agenda addresses competence based curriculum issues around community based education; clinical teaching; assessment; theoretical teaching.				
We have been trying to work in collaborations so that the impact of our research output becomes big.				
We are still having our budget approved for support of research in terms of conferences, and research				
how do you ensure issues of validity, reliability and feasibility of the assessments that you give?				
Feasibility in practical examinations is tested by us inviting some staff members from the clinical area to the school of nursing; that is after the exams have been moderated. We test the stations in terms of their feasibility in terms of time and feasibility in terms of the resources that are there and what is expected to be done				

This has also assisted to review our blueprint				
As a result we have managed to determine things that will be examined using OSCEs. These are limited to tasks that we know we can do with a standardized patient or we can do with a high-fidelity manikin or a task trainer. The rest have been set aside for examining the students as Directly observed practicals.				
In terms of the authenticity, we have some of the modules that do not have a written paper like our community module in first year. The student has to go to the real community where they are observed as they interact with real people When they come back, they prepare a portfolio which is their final examination in their presentation.				
We are also learning in terms of assessments in competence based curriculum that assessment is actually resource intensive as opposed to the old curriculum				
In the old curriculum for their practicum, there will be assessed on 2 procedures, which were not even standardized. One could do a temperature, the other one an injection. They both pass or one passes, and the other one fails. So there wasn't that standardization of assessment,				
But now that we are using the competence based curriculum and OSCEs all these students are exposed to the same situations and same questions and same everything.				
As result assessment has become much fairer.				
But there's a lot of resources that are needed to be put in and sometimes you find that when resources are limited, people will cut corners and maybe may not even assess students fully or comprehensively				

You find that in some institutions they will even say no, we are not putting 10 stations, we will just use five stations and that is a summative assessment. And if you look at the learning outcome that we are trying to assess, the learning outcome hasn't really been fairly or adequately assessed.				
If you could shed more light on these two, what are you doing in terms of assessment for learning and assessment as learning.				
So our assessment for learning are mainly in the workbooks. There are various types of assessment for learning that we have in our way books.				
Through the Senate we were assisted to use so many electronic tools for assessment for learning. We have various software that we are using, to create word puzzles.		The Senate has built capacity on use of technology in assessment	The Senate's input in technological capacity building	External stakeholders
There are so many reflective assessments in the workbooks.				
Some of the assessments for learning are on Moodle.		Assessment activities found on Moodle	Online assessment platforms	Infrastructure for e-learning
In our clinical practice students use their checklist and their lookbooks as they observe each other practicing procedures.				
They videotape each other and give each other feedback as they practise how to present or how to take care of a patient using the computers and the video camera that are available in the simulation lab		Students make use of the video camera and computers for their clinical practise	Software and hardware resources	available infrastructure