



Balancing summative and formative assessments in Tanzania's competency-based education system: implications for educational quality

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ABSTRACT

This paper critically examines the balance between summative and formative assessments within Tanzania's competency-based education (CBE) system and its implications for educational quality. Drawing on a comprehensive and systematic review of contemporary academic literature (2017–2024), this study delves into how both summative and formative assessments can be aligned to meet CBE objectives, which emphasize the cultivation of higher-order thinking, practical competencies, and holistic student development. The findings reveal systemic issues, including the over-reliance on summative assessments for accountability and the underutilization of formative methods crucial for continuous learning and real-world application of knowledge. Using frameworks such as Vygotsky's Social Development Theory, Bloom's Taxonomy, and Constructivist Learning Theory, this study argues for the necessity of policy reforms, teacher capacity-building, and a blended approach to assessment. This paper

concludes with strong recommendations for integrating these assessment forms, addressing educational inequalities, and ensuring that the Tanzanian educational system effectively supports the development of skills of the 21st century.

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1. Introduction

The global shift towards competency-based education (CBE) reflects a growing recognition of the need to equip learners with the practical competencies, critical thinking abilities, and soft skills required in a fast-evolving, knowledge-driven economy (UNESCO, 2017). Unlike traditional education models that prioritize content delivery and memorization, CBE emphasizes demonstrable learning outcomes, application of knowledge, and the development of transferable skills. In Tanzania, the Ministry of Education's adoption of CBE is a strategic attempt to align the national education system with labor market demands, with the ultimate goal of producing graduates who are innovative, self-reliant, and capable of solving real-world problems (Ministry of Education Tanzania, 2020).

However, the realization of these ambitious objectives depends heavily on the nature and effectiveness of the assessment practices employed within the system. Specifically, there is an urgent need to strike a balance between summative and formative assessments to ensure that the goals of CBE translate into meaningful educational experiences and outcomes.

Summative assessments have traditionally dominated Tanzania's education system, particularly at the secondary and tertiary levels. These assessments, often administered as standardized tests or final exams, are used for purposes such as certification, selection, and accountability (Rubeba, 2023). While they serve an important function in measuring academic achievement, summative

assessments are frequently criticized for promoting surface learning and limiting the assessment of essential competencies such as communication, collaboration, and creativity—competencies at the heart of CBE (Andrade, 2019; Brown & Harris, 2018). This dominance of summative assessment not only narrows instructional practices but also reinforces a performance-oriented culture that prioritizes grades over deep learning. In contrast, formative assessments offer real-time insights into student learning and provide opportunities for feedback, reflection, and instructional adjustment (Boud & Falchikov, 2006; Wanner & Palmer, 2018). Despite their proven effectiveness in fostering student agency and higher-order thinking, formative assessments remain underutilized in Tanzanian classrooms, partly due to entrenched institutional practices and a lack of educator capacity (T. Nyinge, 2022; Orodho, 2019).

Research further highlights that the prevailing assessment culture in Tanzanian higher education is misaligned with the pedagogical vision of CBE. Universities often rely on high-stakes examinations that emphasize content recall rather than competency demonstration (B. Nyinge, 2022). Dos Reis et al. (2022) note that rigid institutional policies and assessment traditions serve as barriers to adopting innovative approaches, while Kimaro and Kapinga (2020) point to limited professional development opportunities that hinder instructors from effectively employing formative techniques. These conditions reduce the likelihood that assessments will capture meaningful learning outcomes or foster skill development. Consequently, students graduate with insufficient preparation in areas such as problem-solving, independent inquiry, and teamwork—skills that are critical for both lifelong learning and employability (Ally & Kitula, 2022; Nansubuga et al., 2024).

In addition to institutional and pedagogical limitations, contextual challenges such as large class sizes, inadequate teaching resources, and high instructional workloads further complicate assessment reform in Tanzanian universities (Kimaro & Kapinga, 2020; B. Nyinge, 2022). These constraints not only make it difficult to implement time-intensive methods like project-based or authentic assessment but also limit the capacity for personalized feedback—an essential element of formative assessment (Brown & Harris, 2018). The result is a system that continues to rely heavily on summative metrics while offering limited opportunities for formative, developmental learning experiences. However, emerging technologies, particularly those powered by Artificial Intelligence (AI), offer new possibilities for addressing these gaps. Digital tools such as automated feedback systems, learning analytics, and AI-powered rubrics can support the implementation of formative assessment at scale, offering timely and individualized feedback to students (Furze et al., 2024). Nonetheless, as Gikandi et al. (2011) caution, technological solutions must be grounded in sound pedagogy and tailored to the local context to avoid reinforcing existing inequities or marginalizing the educator's role. Simper et al. (2022) stress that the success of such innovations depends on lead-

ership commitment, institutional culture, and sustained professional development. Therefore, achieving a balance between summative and formative assessment in Tanzania's CBE framework requires not only policy shifts but also a holistic strategy that integrates capacity building, technological innovation, and pedagogical alignment with competency-based goals.

2. Literature review

2.1. Theoretical framework

The theoretical foundations of assessment in education provide essential insights into how summative and formative assessments can function within CBE to promote learning and competency development.

Vygotsky's (1981) emphasizes the socio-cultural context of learning, proposing that cognitive development occurs through social interaction and scaffolding. In this framework, formative assessments act as scaffolding tools that guide learners from their current capabilities to higher levels of understanding (Pellegrino et al., 2018). Vygotsky's emphasis on the "zone of proximal development" (ZPD) highlights the importance of timely and constructive feedback, making formative assessments critical for student growth within CBE environments, where competencies are built progressively.

Bloom's Taxonomy (revised by Anderson & Krathwohl, 2020) provides a hierarchical model for classifying learning objectives, ranging from lower-order cognitive skills such as remembering and understanding to higher-order skills such as analyzing, evaluating, and creating. Traditional summative assessments often focus on the lower levels of this taxonomy, assessing factual recall and comprehension. However, Bloom's model advocates for assessments that target higher-order cognitive skills, which are critical in CBE frameworks. Formative assessments, through project-based tasks and reflective exercises, are more suited to assessing these complex skills, helping students engage in deeper learning and knowledge application.

Constructivist Learning Theory (Piaget, 1952) posits that learners construct knowledge actively through experiences, which challenges the traditional role of assessments as mere summative evaluations of knowledge. In CBE contexts, assessments should be experiential, interactive, and formative, allowing students to engage with and apply their knowledge in real-world scenarios (Carless, 2019). Constructivist theory suggests that the use of authentic assessments—those that involve real-world tasks and problems—can better measure the competencies central to CBE.

2.2. Empirical review

Empirical studies examining assessment practices in Tanzania's education system under the competency-based ed-

education (CBE) framework reveal a persistent imbalance between summative and formative approaches. Summative assessments—primarily in the form of national examinations, midterms, and final tests—continue to dominate classrooms across various levels of education. These assessments serve high-stakes purposes, such as certification, progression, and selection, often shaping the entire instructional process (T. Nyinge, 2022; Rubeba, 2023). The emphasis on summative testing encourages both teachers and students to focus on test preparation, largely at the expense of authentic learning. As B. Nyinge (2022) notes, this summative-oriented culture leads to superficial engagement with curriculum content, marginalizing critical competencies such as creativity, inquiry, and collaboration. Hargreaves (2019) similarly observes that these assessments are limited in scope, privileging content recall over deeper cognitive and practical skills.

Several studies have demonstrated that such summative-heavy systems undermine the goals of CBE by reinforcing rote learning and failing to capture students' ability to transfer knowledge across contexts or solve real-world problems (Pellegrino et al., 2018; Dos Reis et al., 2022). For instance, assessments often exclude competencies such as decision-making, communication, and teamwork—skills that are increasingly valued by employers and society (Brown & Harris, 2018; Nansubuga et al., 2024). Even within tertiary institutions, where learners are expected to engage in complex thinking and independent research, assessment tasks are often constrained by rigid formats and outdated practices (Kimaro & Kapinga, 2020). Institutional policies have not kept pace with educational reforms, and there is often resistance to moving beyond familiar, summative modes of evaluation (Simper et al., 2022).

Conversely, the literature offers compelling evidence of the effectiveness of formative assessments in enhancing learning outcomes and supporting CBE principles. Formative assessment strategies—such as continuous feedback, classroom questioning, peer and self-assessment, and reflective journals—enable learners to monitor their own progress and develop higher-order thinking skills (Hattie, 2017; Wanner & Palmer, 2018). Studies by Brown and Harris (2018) and Gikandi et al. (2011) indicate that formative practices enhance student engagement, promote metacognitive awareness, and support diverse learners by making learning more transparent and accessible. Despite these advantages, formative assessments remain underutilized in Tanzanian classrooms. Ally and Kitula (2022) report that both students and instructors are more familiar and comfortable with summative tests, which often receive institutional and public legitimacy. Teachers lack training in designing and delivering formative assessments, and large class sizes, limited digital infrastructure, and insufficient time exacerbate the challenge (Kimaro & Kapinga, 2020; Gamage et al., 2019).

The integration of digital technologies presents new opportunities for balancing formative and summative

assessments, especially in resource-constrained environments. AI-powered platforms, automated rubrics, and e-assessment tools can offer timely feedback, reduce teacher workload, and support adaptive learning environments (Furze et al., 2024). Research by Ellis and Bliuc (2016) shows that students using online learning technologies are more likely to adopt deep learning approaches, particularly when formative assessments are embedded into digital platforms. However, scholars such as Braun and Clarke (2022) caution that technology alone cannot resolve underlying pedagogical challenges. For technology to be transformative, it must be accompanied by institutional support, professional development, and alignment with CBE objectives (Simper et al., 2022; Dos Reis et al., 2022). Moreover, cultural and contextual considerations must be taken into account to ensure equity and relevance in assessment practices (Sharma et al., 2017).

Several researchers advocate for a hybrid assessment model that merges the accountability of summative assessments with the developmental potential of formative practices. According to Ally and Kitula (2022), such a model ensures comprehensive learner evaluation while fostering core competencies like problem-solving and collaboration. Brown and Harris (2018) emphasize that formative assessments should not replace summative ones but should be embedded throughout the learning process to guide instruction and support continuous improvement. This dual approach is further supported by Nansubuga et al. (2024), who found that blended assessment models in East African classrooms enhanced both academic performance and the acquisition of 21st-century skills. Aina and Smith (2021) argue that aligning assessments with real-life tasks—such as group projects, simulations, and portfolios—offers a more accurate reflection of students' competencies and better prepares them for future careers.

In summary, the empirical literature underscores the urgent need for Tanzanian educational institutions to move beyond a summative-dominant paradigm and embrace a more balanced approach to assessment. While summative assessments remain necessary for certification and standardization, they must be complemented by formative strategies that support learning, reflection, and skill acquisition. Addressing systemic barriers—such as teacher training, policy reform, and resource allocation—is essential to creating an assessment culture that truly supports the goals of competency-based education and improves the quality and relevance of education in Tanzania.

3. Methodology

This paper adopts a systematic review methodology to evaluate the integration of summative and formative assessments within Tanzania's CBE framework. A systematic review was chosen for its ability to synthesize large volumes of literature, identify gaps, and provide evidence-based insights into the effectiveness of assessment practices (Gough et al., 2017).

The literature review was conducted using academic databases, including JSTOR, ERIC, Google Scholar, and Scopus, between January 2017 and February 2024. Search terms included “summative assessment”, “formative assessment”, “Competency-Based Education”, and “Tanzania”. The inclusion criteria limited studies to those that directly examined the impact of assessment methods on CBE outcomes in Sub-Saharan Africa, particularly Tanzania. Of the 85 initial studies identified, 50 were selected based on relevance, methodological rigor, and applicability to the research objective.

Key data were extracted on the integration of formative and summative assessments in CBE systems, their impact on student performance, and their alignment with the competencies outlined in Tanzania's curriculum framework. A thematic analysis was conducted to identify patterns related to the benefits, limitations, and challenges of combining these assessments. The quality of the selected studies was evaluated using the Mixed Methods Appraisal Tool (MMAT), ensuring the validity and reliability of the findings (Hong et al., 2018).

4. Findings and discussion

The findings from this review illustrate a persistent and systemic imbalance in the use of summative and formative assessments within Tanzania's competency-based education (CBE) system. Summative assessments continue to dominate the assessment landscape, serving as the primary mechanism for determining student progression, awarding certifications, and informing decisions related to resource allocation and institutional rankings (T. Nyinge, 2022; Rubeba, 2023). These high-stakes assessments—typically standardized written examinations—have been deeply entrenched in Tanzania's educational system due to their perceived objectivity, ease of administration, and alignment with centralized policy mandates. However, they predominantly focus on assessing factual recall and lower-order thinking skills. As highlighted by Hargreaves (2019), this limited focus has resulted in an overemphasis on rote learning, where both instruction and student engagement are geared toward exam preparation rather than the development of meaningful competencies.

This exam-centric orientation has far-reaching implications. It distorts curriculum implementation, constrains pedagogical innovation, and narrows the scope of learning to what can be easily tested. As noted by Jones and Brown (2020), Tanzanian teachers often teach to the test, designing lessons around likely exam questions, and marginalizing content or activities that promote creativity, collaboration, and critical reflection. The resultant educational experience fails to equip learners with the skills necessary to navigate complex real-world challenges, thereby compromising the foundational goals of CBE, which emphasize holistic, practical, and lifelong learning.

In contrast, formative assessments offer a more nuanced and learner-centered approach to evaluating and

supporting student development. These assessments are designed to provide ongoing, timely feedback that informs both teaching and learning processes. They facilitate student reflection, adaptive instruction, and the gradual acquisition of complex skills. Empirical research underscores their critical role in promoting deeper cognitive engagement, metacognitive skills, and independent inquiry (Hattie, 2017; Carless, 2019). Formative assessments—including peer assessment, self-assessment, classroom questioning, and low-stakes quizzes—encourage active student participation and allow instructors to identify and address learning gaps before they become entrenched.

Despite these documented benefits, formative assessments remain underutilized in the Tanzanian context. Several structural and contextual factors inhibit their effective implementation. Large class sizes, often exceeding 80 students per class in higher education settings, make individualized feedback and continuous assessment logistically challenging (Kimaro & Kapinga, 2020). Additionally, many educators lack sufficient professional development in assessment literacy and pedagogical skills required to integrate formative strategies meaningfully into their practice (Dos Reis et al., 2022). Orodho (2019) points out that the absence of institutional incentives and supportive policies further discourages educators from adopting innovative assessment methods. Moreover, resource limitations—such as inadequate digital infrastructure and lack of instructional materials—impede the regular use of formative tools and technologies that could otherwise alleviate the burden of continuous assessment.

Theoretical frameworks lend strong support to the prioritization of formative assessment within CBE. Vygotsky's Social Development Theory emphasizes the centrality of social interaction, scaffolding, and the “zone of proximal development” in learning. In this view, formative assessment serves as a mechanism through which instructors guide learners from their current level of understanding to more advanced levels of performance. Without such guided interaction, learners are left to navigate complex content without the structured support necessary for deeper comprehension and skill acquisition (Pellegrino et al., 2018; Simper et al., 2022).

Similarly, Bloom's Revised Taxonomy distinguishes between different levels of cognitive complexity—ranging from remembering and understanding to analyzing, evaluating, and creating (Anderson & Krathwohl, 2020). Summative assessments often target the lower tiers of this hierarchy, whereas formative assessments are uniquely suited to scaffold student progress toward higher-order learning objectives. Through iterative feedback and diagnostic assessment, students are empowered to refine their thinking, correct misconceptions, and apply knowledge in authentic, often interdisciplinary contexts (Wanner & Palmer, 2018). This capacity is particularly crucial within CBE, where students are expected to demonstrate not only what they know but also what they can do with that knowledge in practical settings.

Furthermore, the Constructivist Learning Theory reinforces the value of formative assessment by framing learning as an active, social, and context-bound process. In a constructivist classroom, assessment is not merely a means of judgment but a tool for dialogue, negotiation, and shared meaning-making. Formative assessment practices such as collaborative projects, concept mapping, and reflective writing provide students with opportunities to construct knowledge through experience and feedback. These experiences are essential for developing the adaptive expertise that CBE seeks to nurture (Brown & Harris, 2018; Ally & Kitula, 2022).

The synthesis of theoretical insights and empirical evidence highlights the critical need for a hybrid assessment model—one that combines the summative system's strengths in standardization and accountability with the formative approach's emphasis on learning support, personalization, and competency development. As argued by Ally and Kitula (2022) and Aina and Smith (2021), this dual strategy enables educators to measure both foundational knowledge and complex skills in a manner that is both equitable and pedagogically sound.

However, the path toward this balance is not without challenges. Institutional reform is required to promote a culture of formative assessment through policies, leadership commitment, and investment in teacher capacity-building. Professional development programs should be tailored to enhance teachers' assessment literacy and equip them with practical tools to design and implement formative practices. In addition, technological innovations—such as AI-enabled feedback systems, online formative quizzes, and learning analytics—offer scalable solutions that can reduce teacher workload and support timely intervention (Furze et al., 2024). Yet, these tools must be embedded within pedagogical frameworks that reflect the local educational realities and uphold the principles of CBE (Gikandi et al., 2011).

The findings suggest that while summative assessments currently dominate Tanzania's education system, a more balanced integration of formative assessment practices is essential to achieve the transformative aims of competency-based education. Addressing the systemic, institutional, and pedagogical barriers to formative assessment adoption is not merely a technical challenge but a strategic imperative for enhancing educational quality, equity, and relevance in Tanzania's 21st-century learning landscape.

5. Conclusion and recommendations

There is a deeply ingrained imbalance in Tanzania's education system, with summative assessments continuing to dominate while formative assessments remain underutilized. This dominance of high-stakes, standardized exams has created a system that focuses too heavily on rote memorization and lower-order cognitive skills, undermining the goals of competency-based education (CBE), which seeks

to develop holistic, practical, and lifelong learning. To address this imbalance, a more integrated approach to assessment is necessary—one that combines the strengths of both summative and formative assessments. Such an approach would allow for a more comprehensive understanding of student learning, ensuring that students not only acquire knowledge but also develop the critical thinking, problem-solving, and collaborative skills that are crucial for success in today's complex world.

To achieve a balanced assessment system in Tanzania, key actions must be taken. First, institutional reforms and policy support are necessary to foster a culture of formative assessment. Educational leaders should introduce policies that encourage formative assessment practices, provide clear implementation guidelines, and offer incentives for teachers to integrate these practices into their teaching. Additionally, professional development programs should be implemented to enhance teachers' assessment literacy, focusing on practical aspects such as providing timely feedback, conducting peer evaluations, and fostering student reflection. Addressing large class sizes and resource allocation is also crucial, as these challenges hinder individualized attention and continuous assessment. In the short term, technology, such as AI-driven feedback systems and online quizzes, can help manage large classes and provide personalized support.

Furthermore, curriculum design must prioritize formative assessment methods to promote the development of higher-order skills like critical thinking, collaboration, and problem-solving. Teachers should design learning activities that facilitate continuous reflection, peer evaluation, and self-assessment. A cultural shift is also needed to reframe assessment as an ongoing process of learning and growth, rather than just a one-time measure of success. Public awareness campaigns and community engagement initiatives can help build support for formative assessments. Achieving this balance in assessment requires a multifaceted approach that combines institutional reforms, professional development, technological integration, and cultural shifts. By leveraging both summative and formative assessments, Tanzania can create an educational system that nurtures essential competencies and prepares students for the challenges of the 21st century.

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Author contributions

P.M.M. and P.O.W. conceptualized the study. P.M.M. conducted the systematic literature review and data analysis, while P.O.W. contributed to the interpretation of findings and manuscript preparation. Both authors read and approved the final manuscript.

Conflicts of interest

The authors declare no conflicts of interest.

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Data supporting these findings are available within the article or upon request.

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Informed consent statement

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Sample availability

The authors declare that no physical samples were used in this study.

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