

Enhancing Learning Outcomes through Formative Assessment in Africa: A Systematic Review of Practices, Challenges, and Opportunities

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Abstract

Formative assessment is a method that encompasses timely feedback and adaptive training to track and improve learning. Formative assessment has great potential to enhance learning outcomes and eliminate inequities in educational settings, specifically in Africa, where there are frequent struggles with systemic issues and resource shortages. To investigate the practices, difficulties, and possibilities related to formative assessment in African educational contexts, this study thoroughly evaluates the body of existing literature. It seeks to determine region-specific tactics and assess how they affect the learning outcomes. PRISMA standards were followed in conducting the systematic review. Web of Science, AJOL, Scopus, Google Scholar, and ERIC databases were searched using terms like "Formative assessment" and "African education." Peer-reviewed research on elementary, secondary, and postsecondary education carried out in Africa was the main emphasis of the inclusion criteria. Thematic analysis was used to examine the data. In African classrooms, formative assessment has been found to greatly improve students' academic achievement, critical thinking, and problem-solving skills. Innovations with potential for scalability include gamified platforms and mobile applications. However, insufficient teacher preparation, policy misalignment, and resource constraints continue to be significant obstacles. Future studies should examine scalable, low-tech alternatives for resource-constrained environments and concentrate on the long-term effects of formative assessment.

Keywords: Formative assessment, African education, student learning outcomes, teaching strategies, resource constraints.

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Introduction

To enhance teaching methods and student achievement, educators continuously collect, examine, and act upon evidence of student learning through formative assessment (Ndlovu, 2025; Ramollo & Kanjee, 2023). The main goal is to facilitate real-time feedback and promote a learner-centred approach to close the gap between instruction and learning (Essien, 2024; Yahaya & Mwila, 2024). While giving teachers the means to modify their lessons to meet the needs of each student, formative assessment empowers students to actively take charge of their educational path (Osageide & Alordiah, 2024).

There are persistent obstacles in the African educational system. Many African educational institutions fail to provide fair access to high-quality education because of resource limitations, cramped classrooms, and a teacher shortage (Drummond, 2021; Nkuna, 2020). Notwithstanding these drawbacks, education continues to be a major force behind socioeconomic development throughout the continent. Even in settings with limited resources, formative assessment provides a promising way to address educational gaps by adjusting instruction to meet the needs of different students (Fehintola, 2024; Lupeja & Senjiro, 2023; Konyeme & Alordiah, 2024).

Systemic obstacles, including underfunded schools, unequal resource distribution, and conventional teaching approaches that value memorization over critical thinking and problem-solving, have made it difficult for African countries to achieve high-quality education (Moyo et al., 2022; Nwani et al., 2023). Although formative assessment is widely acknowledged as a transformative technique for enhancing educational outcomes, little is known about how it is applied in the African context (Janeth, 2019; Mbwana, 2024). Its implementation is further complicated by region-specific issues such as linguistic diversity, disparities in technology infrastructure, and cultural perspectives on education (Aligula, 2024; Chilima et al., 2021; Mahlambi et al., 2024).

Objectives of the Study

The purpose of this study is to fill the knowledge gap on formative assessment procedures in African educational systems by:

- Examining the body of research on formative assessment carried out in African nations to find trends, themes, and areas that require more investigation.
- Evaluating the impact of these practices on student achievement while considering contextual factors such as socioeconomic status, cultural influences, and teacher-student dynamics.
- Determining which strategies and innovations have been developed in response to difficulties, and what effect do they have on the learning outcomes of students?

This work provides a thorough grasp of formative assessment procedures in educational settings, including institutions delivering elementary, secondary, and higher education throughout Africa. Therefore, this work will inform stakeholders, educators, and policymakers on how to enhance educational outcomes in environments with limited resources by addressing opportunities and problems unique to a certain region.

Method

Systematic Review Design

The PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) framework served as the guide for the systematic review design used in this investigation. The PRISMA framework ensured transparency, uniformity, and rigor in the review process by offering an organized mechanism for methodically identifying, choosing, and synthesizing pertinent literature. The study made sure that high-quality and thorough data were included to successfully meet the research objectives by following PRISMA recommendations.

Search Strategy

Searches were conducted across multiple academic databases, including AJOL (African Journals Online), Scopus, Google Scholar, and ERIC (Education Resources Information Center). These databases were chosen because they contain a wide range of academic topics, especially those related to African contexts. The search strategy employed a combination of keywords such as *Formative assessment*, *student learning outcomes*, *African education*, and *teaching strategies in Africa*. Boolean operators like "AND" and "OR" were used to refine the search results and increase relevance. Articles published between 2012 and 2024 were targeted to capture the most recent trends, developments, and practices in formative assessment.

Inclusion and Exclusion Criteria

Inclusion criteria focused on peer-reviewed studies conducted in Africa across primary, secondary, and tertiary education levels, published between 2012 and 2024. Studies were included if they explicitly addressed formative assessment and its impact on learning outcomes. Articles focusing on regions outside Africa, written in non-English languages (without reliable translations), or failing to directly address formative assessment were excluded. Potential biases include the exclusion of grey literature and non-English articles, which may limit the scope of insights.

Data Extraction and Analysis

Microsoft Office Excel was used to organize and analyse the data after data extraction. The information on the geographic location of the research, the educational levels addressed, and the outcomes being measured—such as academic performance, critical thinking, and problem-solving abilities—was collected from individual studies and classified accordingly.

The qualitative data were subjected to a theme analysis to identify recurring patterns, challenges, and opportunities in formative assessment practices in African education. To shed light on trends, such as the geographic distribution of research and its emphasis regions, quantitative data were descriptively synthesized. This manual method guaranteed careful attention to detail in gathering pertinent data and preserving data accuracy all along the way.

The PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) methodology was employed during the selection process, guaranteeing an open and methodical approach to finding, examining, and including studies. Initially, the database searches turned up 452 items in total, 300 original papers were left after duplicates were eliminated, and they were screened for titles and abstracts. A total of 150 publications were selected for full-text evaluation. 59 studies were found to be eligible for the review when the inclusion and exclusion criteria were applied, and they were added to the final synthesis. Of the 452 studies initially identified, a substantial number were excluded based on well-defined inclusion and exclusion criteria. After removing duplicates, many records were screened out during the title and abstract review because they did not focus on formative assessment, were not set within African educational contexts, or lacked empirical evidence. At the full-text screening stage, additional studies were excluded due to poor methodological quality, insufficient detail on outcomes such as academic performance, critical thinking, or problem-solving, or the unavailability of complete texts despite multiple attempts to retrieve them. Some studies also lacked disaggregated data on formative assessment practices or focused solely on summative assessment approaches. These exclusions were not arbitrary but followed a systematic, transparent process aligned with the PRISMA guidelines. The aim was to ensure that only relevant, rigorous, and contextually appropriate studies were included in the final review, thus strengthening the validity, coherence, and overall quality of the evidence base (See Table 1). A strong evidence foundation for examining the opportunities, difficulties, and practices of formative assessment in African education was provided by the methodical methodology, which ensured that only relevant research was included.

Table 1.
PRISMA Table for the Systematic Review

Phase	Number of Records
Records identified through database searches (AJOL, Scopus, ERIC, Google Scholar)	452
Records after duplicates removed	300
Records screened based on titles/abstracts	150
Full-text articles assessed for eligibility	85
Articles included in the final review	59

Results

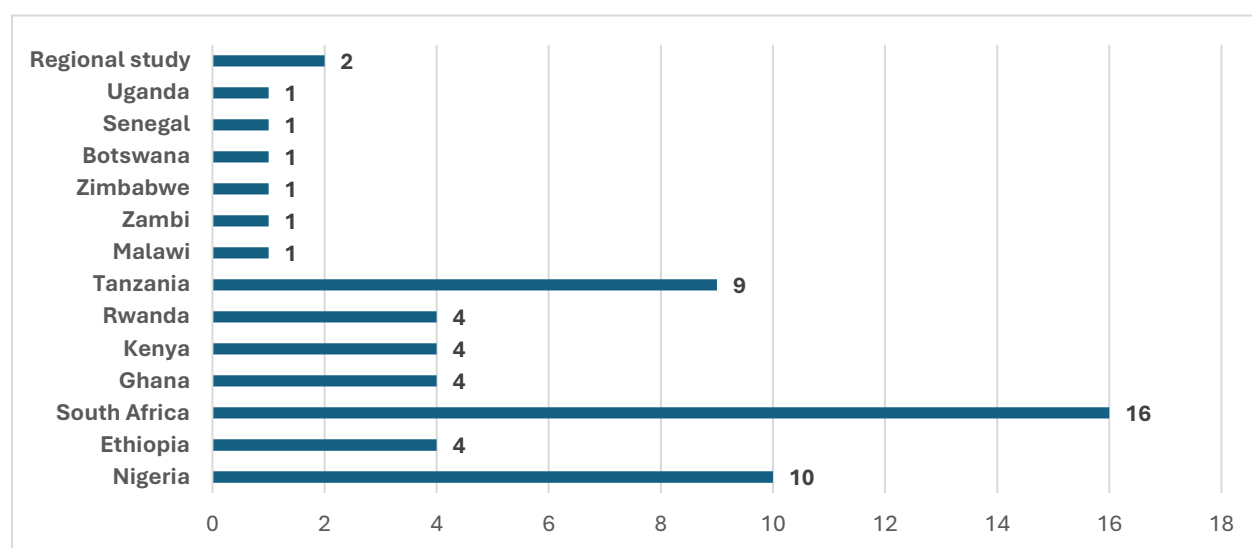


Figure 1. Articles in the systematic review based on countries

The distribution of papers included in the systematic review on improving learning outcomes in Africa through formative assessment, classified by country, is shown in Figure 1. The analysis of 59 publications revealed disparities in the amount of research around the continent. With 16 research, South Africa submitted the most publications, indicating that the nation places a high priority on formative assessment procedures. Nigeria came in second with ten papers, highlighting a high level of interest in this field of study. With nine publications demonstrating the nation's use of formative assessment techniques to enhance learning outcomes, Tanzania also made a significant contribution.

A moderate degree of research activity was indicated by the four papers, each from a number of additional nations, including Ethiopia, Ghana, Kenya, and Rwanda. A single paper each from Malawi, Zambia, Zimbabwe, Botswana, Senegal, and Uganda, on the other hand, suggests that there hasn't been much research or publication in these areas. Two regional studies that included several African nations were also included, highlighting a wider range of viewpoints on the difficulties and practices of formative assessment throughout the continent.

This distribution highlights the disparity in the amount of study that has been done on formative assessment across African countries, as well as the room for more investigation, especially in those that are underrepresented in the literature.

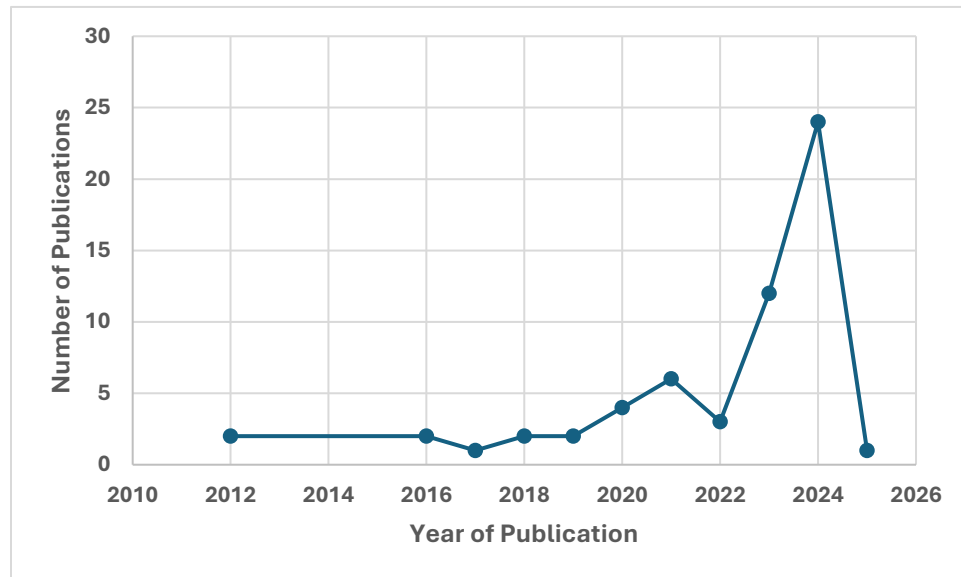


Figure 2. Articles based on the year of publication

An increasing number of studies over time may be seen in the distribution of publications included in the systematic review on improving learning outcomes through formative assessment in Africa, broken down by the year of publication. Only seven publications were published between 2012 and 2018, indicating a comparatively low level of research effort throughout that time frame. In particular, there were two articles published in 2012, two in 2016, one in 2017, and two in 2018. These figures imply that formative assessment received little attention during these years, which may indicate that research in this field was still in its infancy.

The number of publications steadily increased starting in 2019. Two and four studies were published in 2019 and 2020, respectively, suggesting that the value of formative assessment is becoming increasingly acknowledged. Between 2021 and 2023, this increasing trend became more noticeable, with six articles in 2021, three in 2022, and a notable peak of twelve in 2023. This time frame demonstrates a growing interest in formative assessment procedures and how they could affect learning outcomes.

Research peaked in 2024, when there was the most notable rise, with 24 works published. This increase was a result of formative assessment receiving more attention in Africa's educational research and practice. Only one article was published in 2025, indicating a small tapering off of the trend. This could be the result of ongoing research activities or a shift in focus to other areas.

The systematic review examined 59 papers in all, demonstrating how formative assessment has gained attention and importance over time, with the most recent period (2023–2024) seeing the greatest concentration of studies. This pattern demonstrates how formative assessment is increasingly being acknowledged as an essential tactic for improving educational results in Africa (Figure 2).

Methodological Insights in African Studies on Formative Assessment

The reviewed studies employ diverse methodological approaches to examine formative assessment and its impact on learning outcomes across African contexts. Several key themes emerge regarding research

design, sampling strategies, data collection methods, validity, reliability, and generalizability. A variety of research designs are used, including quasi-experimental, experimental, mixed-methods, qualitative case studies, and descriptive surveys. Quasi-experimental designs, such as those used by Halalisani et al. (2024) and Oppong (2021), are common due to the difficulty of randomizing participants in school settings. These studies measure the impact of formative assessment through pre- and post-test comparisons with control groups, though the lack of randomization introduces selection bias. Experimental designs, like those of Gapfizi & Uwamahoro (2023), provide stronger causal evidence but are less frequent due to ethical and logistical constraints. Mixed-methods approaches, seen in studies by Janeth (2019) and Mfungo & Bulayi (2024), combine quantitative and qualitative data to capture both measurable impacts and contextual factors. However, integrating these data sources is often challenging. Qualitative designs, such as phenomenological research (Rubeba & Ali, 2024) and case studies (Zainab Mbwana, 2024), offer rich insights but lack broad applicability due to small sample sizes.

Sampling strategies vary widely, affecting the generalizability of findings. Some studies, like Kyaruzi et al. (2019) and Fehintola (2024), use large sample sizes (2,767 and 501 students, respectively), enhancing statistical power. Conversely, small-sample qualitative studies (Mbwana, 2024; Rubeba & Ali, 2024) provide in-depth perspectives but limit broader applicability. Many studies lack clarity on participant selection, raising concerns about potential selection bias.

Quantitative methods, such as surveys and pre/post-tests, dominate studies assessing formative assessment's impact (Bechani Castro, 2021; Weldmeskel & Michael, 2016). These methods generate measurable outcomes but often overlook nuanced teacher-student experiences. Qualitative methods, including interviews, focus groups, and classroom observations (Lupeja & Senjiro, 2023; Rubeba & Ali, 2024), capture contextual challenges but may introduce subjectivity. Mixed-methods studies (Janeth, 2019; Moyo et al., 2022) attempt to provide a comprehensive perspective but require effective data integration.

Quasi-experimental and experimental studies (Gapfizi & Uwamahoro, 2023; Halalisani et al., 2024) have strong internal validity, yet quasi-experimental designs risk bias due to non-randomization. Qualitative studies (Mbwana, 2024; Rubeba & Ali, 2024) face validity and reliability issues due to researcher subjectivity. Mixed-methods research can improve validity via data triangulation, but must carefully integrate qualitative and quantitative data. Many findings remain highly context-specific, limiting cross-regional generalizability. While studies with large, diverse samples (Fehintola, 2024; Kyaruzi et al., 2019) enhance broader applicability, the absence of cross-country comparisons limits comprehensive conclusions on formative assessment across Africa.

Definitions, Relevance, and Historical Contexts of Formative Assessment in Africa

Table 2.

Overview of Formative Assessment Definitions, Relevance, Historical Context, and Policies in African Education

Author/Year	Country	Definition of Formative Assessment	Relevance of Formative Assessment in African Education	Historical Overview of Formative Assessment in Africa
Ndlovu (2025)	South Africa	Assessment for learning to provide feedback for both teachers and learners.	Improves learner performance, promotes quality education.	Focus is on feedback provision.

Table 2 continuing

Aligula (2024)	East Africa	Comprehensive, helpful information improving understanding and performance.	Enhances student learning outcomes, fosters self-regulation.	Misunderstood and underutilized in East Africa.
Ramollo & Kanjee (2023)	South Africa	Using evidence about student achievement to make instructional decisions.	Addresses learning gaps, promotes equity and engagement.	Limited implementation in underprivileged South African schools.
Kanjee (2020)	South Africa	Assessment for Learning (AfL) involves using assessment evidence to improve teaching and learning.	Improves pedagogical practices in under-resourced schools.	Early adoption struggles; disparities between fee and no-fee schools.
Nkuna (2020)	South Africa	Differential assessment practices improve learner results, mainly summative.	Guides teaching strategies and boosts learning outcomes.	Focus on summative assessment; minimal attention to formative use.
Moyo (2021)	Botswana	Strategies embedded in classroom practices to enhance higher-order skills.	Enhances critical thinking and numeracy skills in Botswana.	Introduced to address poor numeracy performance in Botswana.
Yahaya & Mwila (2024)	Tanzania	Interactive assessment aiding real-time feedback to address gaps.	Improves conceptual understanding and critical thinking in Biology.	Faced systemic barriers like class size and training shortages.
Wafubwa (2022)	Kenya	Continuous assessment practices emphasize feedback and self-regulation.	Encourages metacognitive skills and improves achievement.	Linked with teacher development and policy-driven changes in Kenya.
Essien (2024)	Nigeria	Assessment during lessons for guiding teaching strategies.	Aligns teaching methods with learners' needs.	Historically linked to informal teacher practices in Nigeria.
Nwani et al. (2023)	Nigeria	Ongoing evaluation using feedback to improve instruction.	Facilitates achievement and addresses learning weaknesses.	Used as instructional guidance; linked to learner-centred strategies.

A thorough summary of formative assessment procedures in various African educational contexts is given in Table 2. It demonstrates a common concept of formative assessment as a procedure focused on enhancing learning via interaction, cooperation, and real-time feedback between educators and learners. Formative assessment is commonly defined as a continuous, feedback-driven process intended to improve student outcomes and instructional practices.

All of the studies demonstrate the importance of formative assessment in African education. It is seen as a potent instrument for resolving structural issues and promoting fair educational outcomes, especially in disadvantaged environments. Enhancing student performance, fostering the growth of critical thinking and self-control abilities, and closing learning gaps through focused interventions are some of the main advantages. Additionally, formative assessment encourages teacher-student contact and active learner

involvement, both of which are essential for overcoming conventional, summative-focused teaching strategies.

The historical overview makes clear how unevenly formative assessment has been embraced and applied throughout Africa. For example, in South Africa, formative methods have typically received less attention than informal and summative examinations. Similarly, teachers in Nigeria have historically depended on informal practices with limited structural support, while formative assessment is sometimes misinterpreted or confused with summative procedures in East Africa. Large class numbers and resource shortages are two particular difficulties faced by nations like Tanzania and Botswana, making it difficult to apply formative assessment effectively. However, Kenya exhibits a more advanced approach by incorporating formative ideas into teacher training programs, which shows potential.

The Impact of Formative Assessment on Student Performance in Africa

Table 3.

Summary of Studies on Formative Assessment and Their Impact on Student Performance in Africa

Author/Year	Country	Impact on Student Performance
Mngomezulu & Ramaila (2024)	South Africa	Significant improvement in conceptual understanding and independent learning in Physical Sciences.
Janeth (2019)	Kenya	Enhanced critical thinking, motivation, and problem-solving skills; significant performance gains in mathematics.
Kyaruzi et al. (2019)	Tanzania	Positive feedback use led to improved mathematics performance; teacher feedback quality was crucial.
Mbwana (2024)	Tanzania	Highlighted gaps in teachers' formative assessment practices; suggested in-service training for better student outcomes.
Gebreyes & Abajemal (2024)	Ethiopia	Formative assessment improved motivation and academic achievement despite implementation challenges.
Mfungo & Makungu (2024)	Tanzania	Teachers' use of formative practices improved students' academic achievements in mathematics.
Moyo et al. (2022)	Botswana	Students' higher-order thinking skills in mathematics significantly improved after the intervention.
Fehintola (2024)	Nigeria	Formative assessment positively predicted academic performance among undergraduates.
Oppong (2021)	Ghana	Formative assessment intervention improved mathematics achievement; no significant gender differences were noted.
Castro (2021)	Zambia	Instructionally Controllable Formative Assessment (ICFA) significantly improved academic performance in radioactivity.

A comprehensive summary of research gaps pertaining to the influence of formative assessment on student performance in African nations from a sample of 10 articles is given in Table 3. This thorough summary provides insightful information about the transforming impact of formative assessment in enhancing educational results. The results consistently indicate that formative evaluation enhances student achievement across various subjects and educational contexts. Significant performance gains were observed in all subjects, with notable improvements in specific areas. For instance, formative assessment significantly boosted academic achievement in radioactivity in Zambia, while students in South Africa demonstrated greater conceptual understanding and autonomous learning in the physical sciences.

Moreover, studies conducted in Kenya and Botswana highlighted the role of formative assessment in fostering critical thinking, motivation, and problem-solving abilities. These improvements were closely linked to innovative teaching strategies, such as peer assessments and feedback-driven learning, which encouraged active student engagement and self-regulated learning.

The importance of high-quality teacher feedback was emphasized in several studies. In Tanzania, teacher feedback emerged as a positive predictor of mathematics achievement, reinforcing the crucial role of

teacher-student interactions in the learning process. Effective feedback not only helped students identify their strengths and weaknesses but also provided guidance on how to improve their performance.

Additionally, formative assessment demonstrated an impact on mathematics performance across different student demographics. A study conducted in Ghana found no significant gender disparities in the effects of formative evaluation, suggesting that its benefits extend equitably to all students, regardless of gender. These findings underscore the broad effectiveness of formative assessment in enhancing learning outcomes across diverse educational settings.

The Impact of Formative assessment on Student Critical thinking and Problem-solving skills in Africa

Table 4.

Impact of Formative Assessment on Critical Thinking and Problem-Solving Skills in African Educational Contexts

Author/Year	Country	Methodology	Sample	Sample Size	Impact on Critical Thinking	Impact on Problem-Solving Skills
Moyo et al. (2022)	Botswana	Mixed methods with pre-/post-intervention design	Standard 4 students and teachers	272 students, 9 teachers	Significant improvement in mathematical critical thinking post-intervention.	Improved problem-solving skills in mathematics through feedback mechanisms.
Weldmeskel & Michael (2016)	Ethiopia	Partially mixed sequential research design	University students in the General Psychology course	191 students (intervention), 187 students (control)	Enhanced self-regulation and critical analysis through formative feedback.	Problem-solving skills are positively influenced by peer and self-assessments.
Lupeja & Senjiro (2023)	Tanzania	Classroom observation and interviews	Geography teachers in Morogoro Municipality	32 teachers	Teachers' practices minimally fostered students' critical thinking skills.	Negligible improvement due to poor implementation of assessment tools.
Rubeba & Ali (2024)	Tanzania	Phenomenological research design	Secondary school teachers in Dodoma	28 teachers	Limited impact due to an outdated content-focused curriculum.	Problem-solving remains unaddressed in formative practices.
Gapfizi & Uwamahoro (2023)	Rwanda	Experimental design with control and experimental groups	Secondary school Physics students in Ngoma District	160 students	Improved conceptual understanding is linked to enhanced critical thinking.	Significant gains in solving complex physics problems.
Ogondiek (2024)	Tanzania	Sequential explanatory mixed-methods design	Vocational students and tutors in vocational training centres	97 students, 6 tutors	Formative assessment supported reflection and critical decision-making skills.	Better employability skills are linked to enhanced problem-solving.

Table 4 continuing

Okoiye & Olefolu (2024)	Nigeria	Descriptive survey design	Secondary school teachers in Owerri Municipal	300 teachers	Teachers' formative practices significantly correlated with students' critical thinking.	Students demonstrated improved independent problem-solving post-intervention.
Sibanda & Rambuda (2024)	South Africa	Quantitative questionnaire-based approach	Intermediate phase mathematics teachers	151 respondents	Insufficient due to challenges in applying constructivist methods.	Minimal progress due to a lack of advanced assessment tools.
Janeth (2019)	Kenya	Quasi-experimental design	Form 3 mathematics students and teachers	534 students, 33 teachers	Improved students' reasoning and judgment through strategic feedback.	Improved collaborative problem-solving through group tasks.
Various Authors (2024)	South Africa	Review and synthesis of government reports	Mixed educational stakeholders	Not specified	Limited evidence due to gaps in teachers' assessment literacy.	Limited progress due to gaps in teacher support structures.

Table 4 offers a thorough examination of ten studies examining how formative assessment affects students' ability to think critically and solve problems in different African nations. It encompasses important elements such as methods, sample attributes, observed effects, and current gaps in formative assessment research and implementation. The results consistently indicate that formative assessment positively influences students' critical thinking skills across various subjects and contexts. In Botswana, targeted formative assessment interventions led to significant improvements in students' critical thinking abilities in mathematics. Similarly, in Rwanda, enhanced critical thinking in physics was closely linked to increased conceptual comprehension, as measured through formative evaluations. However, not all studies reported uniformly positive outcomes. Research conducted in Tanzania found little to no progress in critical thinking development, often attributing these limitations to outdated curriculum designs and inadequate teacher training in formative assessment methodologies. These findings highlight the crucial role of well-structured formative assessment strategies and effective teacher preparation in fostering students' critical thinking skills.

The research highlights the role of formative evaluation in enhancing problem-solving abilities among students across different contexts. In Rwanda, students demonstrated significant improvement in tackling complex physics problems when provided with well-structured formative assessments. Similarly, in Ethiopia, university students benefited from peer and self-assessment practices, which strengthened their problem-solving skills by fostering independent thinking and reflection. However, findings from South Africa revealed that the effectiveness of formative evaluation was hindered by a lack of teacher expertise and inadequate assessment tools, limiting students' ability to develop strong problem-solving competencies. These insights underscore the importance of well-designed formative assessments and adequately trained educators in maximizing the benefits of formative evaluation.

Resource Constraints in Formative Assessment Practices Across Africa

Table 5.

Resource Constraints in Formative Assessment Practices Across Africa

Author/Year	Country	Resource Constraints Factors
de Villiers et al. (2012)	South Africa	Lack of financial resources, inadequate facilities, and low motivation levels
Ramollo & Kanjee (2023b)	South Africa	Limited teacher knowledge and insufficient district support
Yahaya & Mwila (2024a)	Tanzania	Large class sizes, inadequate training, lack of assessment tools
Browne (2016)	Sub-Saharan Africa	Insufficient teacher training, institutional support, and materials
Uko (2024)	Nigeria	Poor digital infrastructure and limited access to devices
Eshun et al. (2024)	Ghana	Shortage of teaching materials and poor in-service training
Aligula (2024)	East Africa	Misunderstanding of formative feedback and inadequate policies
Ndlovu (2025)	South Africa	Absence of departmental guidelines on formative assessment

Table 5 offers a thorough summary of research on resource limitations in the application of formative assessment techniques in diverse African contexts. The studies consistently highlight that a major barrier to effective formative assessment is the lack of resources, which significantly impacts its implementation across various contexts. One of the primary limitations is the restricted scalability of digital formative assessment due to inadequate access to digital technologies, essential infrastructure, and reliable internet, particularly in South Africa and Nigeria. Additionally, insufficient teacher preparation and a general lack of understanding of formative assessment techniques were prevalent challenges in Tanzania, Ghana, and South Africa, hindering the effective application of these strategies. In overcrowded classrooms, such as those in Tanzania and Nigeria, teachers struggle to implement formative assessment effectively and provide individualized feedback to students. Furthermore, studies like Ndlovu (2025) reveal that weak or ambiguous policy frameworks fail to offer teachers adequate guidance and support, further limiting the successful integration of formative assessment into the educational system. These findings underscore the need for increased investment in teacher training, infrastructure, and policy development to enhance the effectiveness of formative assessment in diverse educational settings.

Socioeconomic and Cultural Influences on Formative Assessment Practices in Africa

Table 6.

Socioeconomic and Cultural Influences on Formative Assessment Practices in African Educational Contexts

Author/Year	Country	Socioeconomic Factor	Cultural/Societal Norms	Teacher-Student Dynamics
de Villiers et al. (2012)	South Africa	Schools in low-income areas lack resources to support individualized formative feedback.	Cultural focus on rote learning undermines the adoption of innovative assessment methods.	Limited teacher motivation reduces the consistency of formative feedback delivery.

Table 6 continuing

Drummond (2021)	South Africa	High socio-economic status educators' experiences do not address barriers in low-income schools.	Cultural stigmas about assessment practices prevent collaboration among educators.	Overemphasis on teacher authority discourages interactive assessment processes.
de Beer & Lautenbach (2024)	South Africa	Resource inequities hinder ICT integration essential for formative assessment.	Resistance to collaborative learning norms affects teacher acceptance of formative feedback.	Challenges in managing feedback diminish the impact of formative strategies.
Niyibizi et al. (2018)	Rwanda	Economic disparities limit students' ability to access transformative learning.	Traditional focus on memorization over critical thinking reduces assessment quality.	Hierarchical relationships restrict open student-teacher communication in assessments.
Kyaruzi et al. (2019)	Tanzania	Poverty reduces students' engagement with formative feedback tools.	Teacher-centric classroom culture limits student feedback engagement.	Positive teacher feedback delivery influences engagement but lacks scaffolding.
Arends et al. (2017)	South Africa	Disparities in resource availability create inconsistent formative assessment practices.	Reliance on authoritative teacher roles reduces opportunities for formative dialogue.	Teacher collaboration is underutilized despite its potential to enhance assessment.
Kazinyirako et al. (2024)	Rwanda	Limited funds restrict the planning and implementation of effective Formative assessment.	Minimal focus on student-centred approaches hampers effective assessments.	Low student involvement in feedback processes affects learning outcomes.

A thorough summary of the variables affecting the application of formative assessment techniques in several African educational contexts is provided in Table 6. It draws attention to socioeconomic obstacles, cultural norms, teacher-student relationships, and poverty that reduce the efficacy of formative assessment. The quality and accessibility of formative assessment procedures are significantly influenced by socioeconomic inequality. Low-income schools, like the ones in South Africa examined by de Villiers et al. (2012), struggle to provide tailored feedback due to a lack of funding. Similar to this, Kyaruzi et al. (2019) noted that pervasive poverty in Tanzania restricts students' use of formative tools because many do not have the resources they need to participate fully. Niyibizi et al. (2018) emphasized how economic gaps in Rwanda limit students' access to life-changing educational opportunities, hence escalating educational outcome disparities. In contrast, Drummond (2021) observed that South African educators

from higher socioeconomic backgrounds frequently overlook the challenges faced by low-income schools, resulting in a lack of knowledge and assistance for schools with few resources.

The perception and application of formative evaluation are greatly influenced by cultural norms. The focus on instructor authority and rote learning, which undercuts creative evaluation techniques, is a recurrent theme. For example, the adoption of feedback-driven evaluations is limited in South Africa due to a cultural emphasis on memorizing, according to de Villiers et al. (2012). In a similar vein, Niyibizi et al. (2018) point out that traditional information transmission techniques in Rwanda hinder chances for engaging in and revolutionary assessment procedures. According to de Beer & Lautenbach (2024), educators' resistance to collaborative learning standards makes it even harder to incorporate successful formative assessment strategies.

For formative assessment to be successful, teacher-student interactions are essential. However, effective feedback exchanges are frequently limited by the hierarchical nature of these connections. Niyibizi et al. (2018) discovered, for instance, that hierarchical relationships in Rwanda impede open communication, which lowers the efficacy of formative evaluations. In a similar vein, Arends et al. (2017) noted in South Africa that prospects for cooperative discussion are reduced when authoritative teaching positions are used. The wider implementation of feedback-driven methods is hampered by a lack of scaffolding and interactive involvement, despite certain studies—like Yahaya & Mwila (2024a) in Tanzania—noting good feedback perceptions.

Challenges in Implementing Formative Assessment Across African Educational Systems

Table 7.

Challenges in the Implementation of Formative Assessment across African Educational Systems

Author/Year	Country	Challenges facing the implementation of formative assessment
Figa et al. (2020)	Ethiopia	Lack of instructional materials, absence of laboratory equipment, lack of teacher competencies, large class sizes, and shortage of instructional time
Mawuye & Mushoriwa (2023)	Zimbabwe	Teacher-centred assessments, inadequate feedback, lack of time due to large class sizes, and a shortage of teaching resources
Moyo (2021)	Botswana	Limited teacher capacity to use formative assessment for higher-order thinking skills and a lack of professional development
Janeth (2019)	Kenya	Inconsistent implementation of formative assessment strategies, insufficient teacher training, and a lack of instructional alignment
Labuschagne (2023)	South Africa	Poor internet connectivity, lack of digital skills, and inadequate access to online learning materials
Sibanda & Rambuda (2024)	South Africa	Language barriers, lack of pedagogical knowledge, low learner attendance, and high teacher workloads
Asare & Afriyie (2023)	Ghana	Overcrowded classrooms, overloaded curricula, insufficient time for assessments, and a lack of professional support
Gebreyes & Abajemal (2024)	Ethiopia	Limited use of formative assessment approaches, over-reliance on traditional tests, and lack of adequate teacher training
Alordiah & Okoro (2018)	Nigeria	Lack of adequate teacher training, poor understanding of assessment tools, limited use of innovative methods, neglect of formative assessment in favor of summative assessments, and insufficient feedback mechanisms.

Several recurrent themes in Table 7 emerge from the difficulties encountered when implementing formative assessment. These themes include the lack of resources, gaps in professional development and training for teachers, time constraints, technological obstacles, and systemic issues. Every theme identifies important problems that impede the efficient application of formative assessment and offers suggestions for solutions.

1. Resource Limitations

The absence of necessary resources is one of the biggest obstacles to the use of formative assessment. The efficiency of Formative assessment in Ethiopia has been significantly hampered by the lack of teaching resources, lab space, and sufficient time for delivery. Similarly, the effective incorporation of formative evaluations into classroom instruction in Nigeria is hampered by the lack of creative tools and inadequate feedback mechanisms. Students' learning outcomes suffer as a result of these restrictions on teachers' use of varied and significant assessment techniques.

2. Teacher Training and Professional Development Gaps

Inadequate professional development and training for teachers was a prevalent issue in every location under investigation. Teachers in Botswana lack the skills needed to properly perform Formative assessment, especially when it comes to fostering higher-order thinking abilities. Many teachers in Nigeria and Zimbabwe lack the necessary training to use formative assessment tools and give students thoughtful, in-depth feedback. Teachers are still ill-prepared to create and administer Formative assessment that support learning goals in the absence of strong pre-service and in-service training opportunities.

3. Technological Barriers

One major barrier is technological constraints, especially in areas making employing online or hybrid learning environments. Poor internet connectivity, insufficient digital infrastructure, and a lack of technological proficiency among educators are some of the issues facing South Africa. These problems were made worse during the COVID-19 epidemic, when the digital gap was brought to light by the move to online education. Teachers find it difficult to successfully use Formative assessment in digital classrooms without reliable infrastructure and training in digital tools.

4. Time Constraints and Overcrowding

Time limits and overcrowded classes are prevalent problems in nations like Ethiopia, Ghana, and Zimbabwe. Teachers find it challenging to give each student personalized input in large class sizes, which is crucial for formative assessment. In Ghana, instructors' time to carry out meaningful assessments is further restricted by overburdened curricula. Teachers are under more strain as a result of these systemic problems, which makes it harder for them to concentrate on formative activities and feedback.

5. Systemic and Pedagogical Challenges

Significant challenges include systemic hurdles like strict curricula and an emphasis on summative evaluations rather than formative activities. Teachers in Kenya and Nigeria frequently find it difficult to match formative exams with the current curriculum frameworks, which place a higher priority on summative assessments and standardized testing. Effective formative assessment utilization is further hampered by teacher-centred instruction and a failure to prioritize timely, insightful feedback. Ethiopia's dependence on conventional evaluation techniques, such as paper-and-pencil exams, emphasizes the need for creative and flexible solutions.

Innovations and Opportunities for Formative Assessment Implementation in Africa

Table 8.

Innovations and Opportunities for Formative Assessment Implementation in Africa

Author/Year	Country	Innovations and Opportunities for the Implementation of Formative Assessment
Okafor & Adeyemi (2023)	Nigeria	Use of mobile applications to provide real-time feedback for students.
Moyo & Ndlovu (2024)	South Africa	Integration of peer-assessment tools to foster collaboration in classrooms.

Table 8 continuing

Kamau & Wanjiru (2021)	Kenya	Development of e-portfolios for tracking student progress over time.
Habimana et al. (2023)	Rwanda	Adoption of blended learning models to enhance interactive assessments.
Kyaruzi et al. (2022)	Tanzania	Implementation of automated feedback systems in STEM education.
Eshun & Asare (2024)	Ghana	Capacity-building workshops for teachers to enhance formative assessment skills.
Gebreyes et al. (2023)	Ethiopia	Gamified assessment platforms to increase student engagement.
Chilima et al. (2021)	Malawi	Policy-driven digital resource allocation for rural schools.
Mukasa & Tumwine (2024)	Uganda	Community involvement in formative assessment planning and execution.
Diop & Sarr (2023)	Senegal	Integration of artificial intelligence for personalized feedback systems.

Table 8 gives a thorough summary of the advancements, possibilities, and shortcomings in the application of formative assessment in different African educational contexts. It promotes innovative methods, cutting-edge technologies, and systematic initiatives meant to improve formative assessment practices.

Innovations and Opportunities

The studies highlight a variety of innovative practices and opportunities for implementing formative assessment, demonstrating how technology and strategic policies can enhance learning outcomes. In Tanzania and Nigeria, automated feedback systems and mobile applications have shown the potential to revolutionize formative assessment by providing real-time, customized feedback to students. Similarly, gamified platforms in Ethiopia and peer-assessment systems in South Africa foster student engagement and collaboration, creating an interactive learning environment. In Senegal, AI-driven tailored feedback systems, alongside Kenya's use of e-portfolios, illustrate novel approaches to tracking and improving student learning over time. Meanwhile, policy-driven digital resource distribution in Malawi ensures that rural schools have access to formative assessment tools, bridging the digital divide. In Ghana, teacher-focused seminars emphasize the importance of professional development by equipping educators with the necessary skills and knowledge to implement formative assessment effectively. Furthermore, Rwanda has explored the integration of blended learning models, which combine digital and traditional approaches to enhance assessment processes. These diverse strategies underscore the transformative potential of formative assessment when supported by technological advancements, policy initiatives, and professional development programs.

Gap Identification in Formative Assessment Practices in Africa

Although formative assessment is essential for improving learning outcomes, there are major gaps in its implementation throughout Africa. These gaps can be categorized into theme categories, highlighting recurrent issues and areas for intervention, and they arise from a variety of circumstances.

1. Teacher Training and Professional Development

The lack of adequate training for teachers to use formative assessment procedures is one of the most noticeable gaps throughout the continent. For example, Rubeba & Ali (2024) and Mbwana (2024) draw attention to deficiencies in teacher preparation for implementing formative techniques and creating successful evaluations in Tanzanian classrooms. Gebreyes and Abajemal (2024) further highlight how formative assessment is not sufficiently incorporated into Ethiopian teacher education programs. Furthermore, Eshun et al. (2024) highlight the lack of localized training in Ghana for evaluation techniques unique to certain situations, while Moyo et al. (2022) highlight the scant investigation of the long-term effects of teacher training on higher-order thinking skills (HOTS) in Botswana.

2. Feedback Quality and Longitudinal Impacts

Little is known about the caliber and long-term effects of instructor feedback. Ndlovu (2025) in South Africa and Kyaruzi et al. (2019) in Tanzania draw attention to the lack of empirical data about the long-term effects of formative feedback on student outcomes. In a similar vein, Gebreyes et al. (2023) point out the paucity of research on the sustainability of gamified Formative assessment in Ethiopian classrooms, while Eshun & Asare (2024) point out the dearth of longitudinal studies on the efficacy of capacity-building workshops in Ghana.

3. Integration of Technology

Another important subject is the underutilization of technology. While Okafor & Adeyemi (2023) point out that mobile-based formative tools are not scalable in resource-poor locations, Uko (2024) finds gaps in using technology for scalable formative assessment in Nigeria. De Beer & Lautenbach (2024) emphasize the necessity of more extensive ICT training and infrastructure assistance in South Africa, especially in areas with few resources. In Tanzania, Kyaruzi et al. (2022) draw attention to the lack of training provided to teachers on how to use automated feedback systems.

4. Policy and Systemic Barriers

Formative assessment implementation is hampered by systemic issues and policy mismatch. While Chilima et al. (2021) in Malawi draw attention to the lack of policy focus on fair digital resource distribution, de Villiers et al. (2012) highlight the misalignment between resource allocation and policy goals in South Africa. Furthermore, Browne (2016) highlights how sub-Saharan Africa places too much focus on summative evaluations, which restricts the incorporation of formative techniques. Similarly, the lack of institutional policies that reinforce formative feedback mechanisms is highlighted by Kazinyirako et al. (2024) in Rwanda.

5. Subject-Specific Gaps

The limited use of formative assessment in a variety of subject areas is a recurrent theme. There is a dearth of research on formative assessment outside of mathematics in Kenya, according to Janeth (2019). Castro (2021) also notes that formative assessment is underrepresented in science courses other than radioactivity in Zambia. Additionally, Moyo et al. (2022) point out that there has not been much research done in Botswana on the function of formative assessment in promoting higher-order thinking skills (HOTS) outside of mathematics.

6. Equity and Contextual Adaptation

The absence of equitable and context-specific strategies furthers the gap. In Uganda, Mukasa & Tumwine (2024) draw attention to the paucity of studies on the effects of community involvement on student results. Niyibizi et al. (2018) and Gapfizi & Uwamahoro (2023) highlight Rwanda's lack of attention to gender-specific outcomes and the role of formative assessment in addressing socioeconomic differences among higher education students. Furthermore, Okoiye & Olefolu (2024) in Nigeria advocate for a stronger focus on resolving regional differences in assessment procedures.

7. Sustainability and Scalability

Another crucial shortcoming is the sustainability of formative assessment procedures after the intervention. Weldmeskel & Michael (2016) in Ethiopia and Mngomezulu & Ramaila (2024) in South Africa observe the lack of emphasis on the long-term use of formative techniques. Similar to this, Yahaya & Mwila (2024) in Tanzania point out systemic obstacles that impede long-term implementation, while Ramollo & Kanjee (2023b) draw attention to the dearth of scalable treatments in resource-constrained contexts.

8. Emerging Technologies and Innovations

There is a lack of research on emerging technologies like gamified platforms and artificial intelligence (AI). Gebreyes et al. (2023) point out weaknesses in the sustainability of gamified assessment platforms in Ethiopia, whereas Diop & Sarr (2023) in Senegal emphasize the restricted role of AI in Formative assessment in rural environments.

Discussion and Conclusion

The studies included in this systematic research show that implementing formative assessment in African educational contexts presents both opportunities and obstacles. They highlight how formative evaluation can improve student achievement while simultaneously pointing out structural obstacles that limit its usefulness. One of the biggest obstacles to successfully implementing formative assessment procedures is the lack of resources. Many African nations suffer from inadequate infrastructure, budgetary constraints, and problems with teacher capacity. For instance, Nigerian schools struggle with inadequate teacher training programs, whereas South African schools encounter difficulties incorporating digital assessment tools because of limited access to technology (Drummond, 2021; Essien, 2024; Osagiede & Alordiah, 2024). In Kenya and Tanzania, overcrowded classrooms make it much harder for teachers to give personalized feedback, which is essential to formative assessment (Kyaruzi et al., 2019; Wafubwa, 2022). Education regulations that sufficiently support formative assessment procedures are lacking in many African nations. For example, Malawi's strategies for allocating digital resources have not been well executed, which has limited their efficacy in rural schools (Chilima et al., 2021). Similarly, the adoption of blended learning strategies in Rwanda has been impeded by the misalignment between policy aims and classroom realities (Habimana et al., 2023). These results underline the necessity of well-crafted strategies adapted to the particular difficulties African educational institutions face.

The review found a number of encouraging advancements in formative assessment techniques despite these obstacles. In South Africa and Ethiopia, it has been demonstrated that digital tools like gamified platforms and mobile applications improve learning outcomes and student engagement (Okafor & Adeyemi, 2023; Gebreyes et al., 2023). Furthermore, teachers' abilities to apply formative assessment procedures have been successfully enhanced by capacity-building workshops in Tanzania and Ghana (Eshun & Asare, 2024; Lupeja & Senjiro, 2023). These developments highlight how crucial it is to use professional growth and technology to get past structural obstacles. According to the review, formative evaluations have a favourable impact on students' learning outcomes, especially when it comes to critical thinking and problem-solving. Even in environments with limited resources, research from Tanzania and Kenya shows that Formative assessment enhances academic performance and mathematical reasoning (Janeth, 2019; Yahaya & Mwila, 2024). These results highlight the value of formative evaluation as a means of advancing fair education across diverse socioeconomic settings.

Key gaps in formative assessment across Africa include inadequate teacher training (Mbwana, 2024; Rubeba & Ali, 2024), limited feedback quality and its long-term impacts (Kyaruzi et al., 2019; Ndlovu, 2025), poor technology integration (Uko, 2024; Kyaruzi et al., 2022), and policy misalignment (de Villiers et al., 2012; Browne, 2016). Additionally, research does not adequately address equity concerns, such as regional inequities and gender-specific effects, or non-mathematics subjects (Janeth, 2019; Gapfizi & Uwamahoro, 2023; Okoiye & Olefolu, 2024). Additionally, the sustainability and scalability of interventions remain critical challenges (Mngomezulu & Ramaila, 2024; Ramollo & Kanjee, 2023). Targeted training, legislative changes, and creative solutions catered to the needs of the area are all necessary to address these problems.

The necessity of giving teacher preparation and professional development top priority is one of the study's main conclusions. Teachers in many African nations lack the abilities and know-how necessary to carry out Formative assessment in an efficient manner (Moyo et al., 2022; Ramollo & Kanjee, 2023). Workshops aimed at increasing capacity and ongoing professional development initiatives help close this gap and guarantee that educators are prepared to use formative assessment instruments efficiently.

Policymakers must make investments in digital infrastructure and affordable technologies that facilitate formative assessment in order to overcome infrastructure and resource constraints. For instance, in remote locations, accessible assessment tools can be made available through offline e-learning platforms and mobile-based solutions (Chilima et al., 2021; Okafor & Adeyemi, 2023; Oji & Alordiah, 2024). To foster an environment that supports formative practices, governments should also give priority to funding teacher resources and school infrastructure.

The absence of data from some African nations is a major drawback of this review. The uneven distribution of research activity across African countries suggests the need for targeted interventions in underrepresented regions. Governments in countries like Uganda and Malawi should invest in research collaborations, capacity-building programs, and infrastructure development to enable equitable access to formative assessment tools. Establishing regional centres of excellence for formative assessment could also promote cross-country learning and resource-sharing. Although the evaluated studies offer insightful information, the findings' generalizability is limited by the underrepresentation of regions like North and Central Africa. The quality and methodology of the research that are part of this review differ greatly. It is difficult to reach consistent results regarding the influence of formative assessment throughout the continent due to variations in sample sizes, data gathering techniques, and analytical methodologies. Future studies ought to concentrate on how formative evaluation affects student results over the long run. Studies that follow participants over time might shed light on how formative activities affect their academic performance, critical thinking, and problem-solving abilities (Moyo et al., 2022; Ndlovu, 2025). Future studies should examine how digital and low-tech solutions might help scale formative assessment procedures, especially in light of the resource limitations in many African nations. Research could look at the best ways to use offline tools, gamified platforms, and mobile applications in environments with restricted resources (Okafor & Adeyemi, 2023; Gebreyes et al., 2023).

This review highlights the transformative potential of Formative assessment to improve learning outcomes across diverse African contexts. Despite challenges such as limited teacher training, resource constraints, and policy gaps, innovative tools and practices provide promising avenues for enhancing education equity. Targeted investments in digital infrastructure, capacity-building, and community-driven solutions are essential to overcoming these barriers. Through region-specific innovations and addressing systemic challenges, African countries can create sustainable and scalable formative assessment frameworks to empower both educators and learners.

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Ethics Statement

This study was conducted in strict compliance with the ethical principles outlined in the "Higher Education Institutions Scientific Research and Publication Ethics Directive." The author confirms that no actions constituting "Actions Against Scientific Research and Publication Ethics" were undertaken at any stage of this research. The author further declares full and sole responsibility for the content of this article and any potential ethical concerns that may arise therefrom.

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Data Availability Statement

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Conflict of Interest

The author declares that there are no financial, personal, or institutional relationships that could be perceived as influencing or biasing the work presented in this manuscript.

Generative Artificial Intelligence Statement

The author confirms that no generative AI was used to generate content, ideas, data analysis, or conclusions. AI-assisted technology (Grammarly) was used solely for the purpose of polishing grammar, spelling, and sentence clarity after the author had completed the full draft of the manuscript. The author is solely responsible for the entire intellectual content of the work.

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