

Fostering Effective Teaching Practices: Integrating Formative Assessment and Mentorship in Indonesian Preservice Teacher Education

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Abstract

The paper explores the implementation and effectiveness of formative assessment strategies to decorate the mastery of teaching competencies among preservice teachers in Indonesia. It specializes in the role of mentoring in guiding and helping preservice teachers efficiently make use of formative assessment practices to improve their instructional techniques and learner studying results. The study investigates the demanding situations and opportunities encountered in integrating formative assessment into the teacher education curriculum and offers guidelines for enhancing the mentorship system. The research method uses a systematic literature review incorporating the evaluation synthesis and guidance for mentors in enhancing the skills and knowledge of future educators in the context of formative assessment. The findings of the current study are exemplified through an analysis of the several facets of formative assessment and its advantages in enhancing teaching and students' acquisition of knowledge. The findings also offer precious insights for teachers, mentors, and policymakers seeking to elevate the best of teacher education packages and continuous professional improvement amongst preservice teachers by guiding them on the rigorous theories and procedures of formative assessment. This study provides a summary of the theoretical contributions and a step-by-step process for implementing formative assessment. It also discusses the implications of formative assessment for assessment education policies and practices in Indonesia.

Keywords: formative assessment mastery, preservice teacher mentoring, teachers training curriculum, pedagogical guidance, students learning outcome



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1. Introduction

The implementation of formative assessment within the educational sphere in Indonesia holds considerable significance. It is an empirically substantiated approach that permits educators to consistently track the advancement of students and offer punctual feedback to augment the outcomes of learning. The objective of this manual is to furnish a comprehensive framework for guiding and

supporting pre-service instructors in the effective integration of formative assessment practices.

Unlike comprehensive testing, formative assessment is a method for enhancing learning and teaching that generates, interprets, and applies student data to meet the learning objective. It does not serve as a measure of responsibility but rather as a tool for acquiring knowledge. The primary purpose of formative

assessment is to establish a close relationship between student needs, strengthen student learning, and foster student self-regulation (Xiao & Yang, 2019; Kaur & Lim-Ratnam, 2023). It is designed to be a frequent, ongoing method that uses evidence from student evaluations to inform educational decisions throughout the learning process.

Formative assessment also involves gathering evidence of learner learning, providing feedback, and adapting practice to satisfy students' needs. In the context of mentoring preservice teachers in Indonesia, understanding the significance of formative assessment is crucial for fostering effective teaching practices and promoting learner achievement. Formative assessment is a process used by teachers and students during instruction that provides feedback to guide ongoing teaching and improve students' achievement of intended educational outcomes. It includes the continuous accumulation and evaluation of evidence in the course of learning the process. Teachers use accumulated evidence to identify areas where students are struggling and to provide timely, focused interventions to help students improve their learning. On the other hand, students use feedback from formative evaluation to understand their strengths and weaknesses and set learning goals.

Assessments conducted by teachers can be related to student attitudes (Prasetyarini et al., 2021). Teachers need to make appropriate learning assessments (written test assessments) to determine the character of each question and analyze the extent of students' understanding (Winarti & Mubarak, 2019; Asrial et al., 2023). In the context of mentoring preservice teachers in Indonesia, it is essential to highlight the role of formative assessment in promoting reflective teaching practices. By emphasizing the role of formative assessment in providing actionable insights into learners' learning, preservice

teachers can deepen their understanding of learners' needs and make informed instructional decisions. By constantly assessing students' development, preservice teachers can identify areas of strength and weakness, allowing them to tailor their guidance to meet unique learning needs (Stronge, 2018). This personalized teaching approach fosters a supportive and inclusive learning environment, leading to improved learning outcomes. Students receiving timely and constructive feedback through formative assessment are much more likely to stay engaged and motivated by their learning. Finally, preservice teachers can leverage formative assessment practices to encourage active participation, self-reflection, and goal-setting among their students during their teaching practicum (Min, 2016).

Preservice teachers are actively involved in planning and implementing formative assessment throughout their teaching practicum (Børte et al., 2023; Xie & Cui, 2021; Rahman et al., 2021). Formative assessment is widely acknowledged as a beneficial tool for enhancing student learning (Yan et al., 2023). The efficacy of formative assessment hinges on how teachers perceive and implement formative assessment activities in the classroom. However, there is a lack of systematic study of the factors that may support or impede preservice teachers' intentions and implementation of formative assessment.

The primary research objective is to identify factors that support the implementation and evaluation of the effectiveness of learning strategies focused on formative assessment for preservice teachers in Indonesia. The significance of this research lies in its focus on formative assessment of mastery in mentoring preservice teachers in Indonesia. This research examines uncharted terrain by illuminating the precise obstacles and possibilities within this setting. Our distinctive addition to the current body of knowledge resides in our

comprehensive investigation of the complexities involved in guiding aspiring educators in Indonesia, with a particular focus on formative evaluation. By addressing this gap in the scholarly literature, our objective is to offer valuable insights and suggestions to enhance the efficacy of programs that mentor future teachers in the Indonesian educational system.

To determine what is needed to successfully deploy assessment for learning in classrooms, [Heitink et al. \(2016\)](#) performed a systematic review. One method of formative assessment considered in their research as part of classroom practice was assessment for learning. The importance of student agency in assessment for learning was a central theme. Teacher, student, assessment, and context were the four pillars upon which the authors built their prerequisites. First, the teacher needed the necessary information and abilities; second, they needed the right beliefs and attitudes. The review by [Heitink et al. \(2016\)](#) covered a lot of ground; however, there weren't many qualifications for each of the many topics they examined. To illustrate the point, the teaching aspect was only addressed by two of the qualifications. The context focused solely on the school's internal elements, ignoring external influences. It is worth noting that their analysis primarily focused on factors that affect the quality of assessment for learning implementation, rather than on aspects that determine whether teachers will genuinely aim to do so.

In the same year, [Rosdy & Yunus \(2021\)](#) identified groups of factors that affect instructors' likelihood of using formative assessment: internal, external, resource-related, and contextual. Yet, the piece by [Zulfikar \(2009\)](#) merely served as an overview of the narrative. Consequently, readers might not know what to expect from the review in terms of breadth and depth.

Additionally, using meta-analysis, [Lee et al. \(2020\)](#) conducted a systematic review of prior formative assessment interventions in K-12 education in the United States. The main objectives were to determine the overall impact of formative assessment on student learning and to identify the characteristics of these interventions and their influence on learning outcomes. Regrettably, the review's limits and the criteria for search terms, period, language, and research design may have led to the elimination of valuable studies that may have contributed to knowledge and understanding.

Therefore, the existing literature fails to provide a thorough and precise understanding of the pivotal elements that support preservice teachers' intentions and the actual implementation of formative assessment. This review study seeks to address this gap by identifying characteristics that influence preservice teachers' intentions and practices regarding formative assessment, drawing on existing research.

Formative assessment serves as a roadmap for monitoring students' learning development over time ([Brink & Bartz, 2019](#)). By regularly assessing and monitoring students' overall performance, preservice teachers can identify areas that require additional attention ([Clarke, 2014](#); [Kosnik & Beck, 2009](#)). This iterative approach to assessment permits teachers to scaffold mastery stories, build on prior expertise, and guide students closer to mastery of key standards and competencies. Embracing formative assessment practices nurtures a subculture of continuous improvement inside the classroom. Preservice teachers can model the value of ongoing comments and reflection, demonstrating to their students that learning is a dynamic and iterative process ([Buck et al., 2010](#)). By continually assessing and adapting their teaching methods in response to learner feedback,

teachers exemplify the importance of lifelong learning and resilience in the face of challenges. Formative assessment can also play a pivotal position in promoting equity and inclusion in the classroom. By gaining a deeper understanding of learners' needs and learning styles, preservice teachers can implement differentiated instructional techniques to accommodate diverse learners. This proactive assessment method helps reduce achievement gaps and ensures that all students can be successful.

Mastery of formative assessment enables teachers to identify learners' misconceptions, tailor instruction to individual needs, and foster supportive learning environments (Heritage, 2021). Preservice teachers who expand their knowledge in formative assessment are better equipped to satisfy the diverse needs of their future students and contribute to improved academic outcomes (Clark, 2012). Mentoring preservice teachers in learning formative assessment goes beyond providing theoretical understanding; it involves fostering practical competencies, reflective practices, and pedagogical insights (Xie & Cui, 2021). Preservice teachers, through the complexities of formative assessment, are supported in recognizing how to combine it seamlessly into their teaching practices (Patthoff, 2022). In Indonesia, mentoring preservice teachers in mastery of formative assessment is both an undertaking and an opportunity. The variety of instructional settings, various stages of infrastructure, and the need to align with countrywide curriculum standards present unique challenges for preservice instructor mentoring. However, it also opens opportunities for progressive strategies, collaboration between teacher training institutions and faculties, and the integration of technology-enhanced assessment methods. By addressing those challenges and leveraging the available opportunities, mentors can effectively help

preservice teachers acquire the key competencies to understand formative assessment (Kindall et al., 2017). Mentors can begin by way of offering preservice teachers a robust theoretical foundation in formative assessment standards and practices. This may additionally attract them to discussions, workshops, and practical demonstrations to deepen their expertise. Additionally, mentors can facilitate opportunities for preservice teachers to examine and co-train with experienced teachers, allowing them to witness powerful formative assessment strategies in action.

Furthermore, mentors can inspire preservice teachers to reflect on their assessment practices, offer positive comments, and support them in developing their specific assessment styles (Nesje & Lejonberg, 2022). In the context of the Indonesian education system, formative assessment is a critical tool for teachers to identify students' strengths and weaknesses, tailor practice to individual needs, and ultimately improve learning outcomes (McTighe & Ferrara, 2021). However, formative assessment in Indonesia offers both challenges and opportunities for preservice teachers and mentors (Arrafii, 2023; Arrafii, 2020; Prastikawati et al., 2022; Defianty, 2018). One of the primary challenges within Indonesian education is the limited integration of formative assessment practices in classroom guidance (Clifton, 2023). Traditional assessment strategies, which include high-stakes tests, regularly overshadow the use of formative assessment strategies. This can result in a lack of real-time feedback for students and an overlooked opportunity for teachers to adjust their teaching techniques based on learners' ongoing development. Additionally, preservice teachers in Indonesia may have limited exposure to formative assessment techniques throughout their teacher education programs (Arrafii, 2020; Purwadi et al., 2022). This can create a gap in their knowledge of

how to effectively implement and leverage formative assessment practices in the classroom, hindering their ability to help students learn optimally.

Despite those challenges, there are promising opportunities to improve preservice teachers' mastery of formative assessment in Indonesia. The ongoing educational reforms include the implementation of a competency-based curriculum and an emphasis on twenty-first-century abilities, thereby creating conducive environments for integrating formative assessment into teaching practices (Moss & Brookhart, 2019). Furthermore, the increasing availability of technology and digital equipment in Indonesian classrooms presents a possibility to streamline formative assessment approaches (Prastikawati, 2021). Mentors can guide and model effective formative assessment practices, providing preservice teachers with practical examples and strategies to implement in their classrooms. To mentor preservice teachers efficiently, mentors need to be conscious of various key areas:

- i. Preservice teachers need stable information on the essential concepts of formative assessment, including the significance of ongoing feedback, student involvement in the assessment process, and the use of assessment data to inform practice.
- ii. Mentors can exhibit and instruct preservice teachers in implementing a variety of formative assessment strategies, such as questioning techniques, peer and self-assessment, and formative use of summative checks.
- iii. Given the increasing digitalization of training in Indonesia, mentors can assist preservice teachers in leveraging generative tools for formative assessment and digital quizzes, as well as in learning about management structures and data analysis platforms.

- iv. Mentors can guide preservice teachers in using formative assessment records to differentiate preparation, tailoring their teaching to meet students' needs and learning styles.

Formative assessment and summative assessment are two essential components of the educational assessment method. It is vital for teachers, especially those mentoring preservice teachers, to recognize the distinctions between these types of assessment to effectively guide their students toward mastery. The primary goal of formative assessment is to provide feedback to each teacher and student, allowing for the identification of strengths and weaknesses in learning (Clark, 2012). These remarks are then used to adjust teaching and learning to better meet students' needs. Formative assessment is typically informal and may include quizzes, discussions, observations, and homework assignments (Fisher & Frey, 2014). The emphasis in formative assessment is on development, learning, and growth rather than on assigning grades. Summative assessment occurs at the end of a learning period and is used to assess students' learning outcomes and achievement (McMillan, 2010). It is commonly formal and entails assigning grades or rankings to students based on their overall performance on exams, projects, or presentations. The primary reason for summative assessment is to measure the extent to which students have mastered the content or skills taught during a particular period (Kibble, 2017; Ali, 2024). Unlike formative assessment, summative assessment focuses on making judgments about learner achievement and determining if learning objectives have been met.

One important difference between formative and summative assessments is the timing of their implementation and their respective purposes. Formative assessment

occurs at some point in the learning process, informing teaching and learning strategies (Konopasek et al., 2016). In comparison, summative assessment takes place at the end of the academic year and aims to assess student success and assign grades (Tomlinson & Moon, 2013). Formative assessment emphasizes providing students with feedback that helps them understand their learning progress and areas for improvement (Mohamadi, 2018). It focuses on the study process and seeks to facilitate learning and mastery. In assessment, summative assessment focuses on measuring the final results of learning and assigning a final judgment of students' achievement (Trotter, 2006). While both types of assessment are valued, formative assessment plays a crucial role in fostering a more positive attitude and ongoing development among students.

Formative assessment has an immediate impact on teaching and learning because it provides teachers with valuable information about students' progress, enabling them to adjust their instructional strategies (Irons & Elkington, 2021). It supports differentiated education and customized learning reviews. Summative assessment is important for measuring common achievement but might not have a direct impact on teaching and learning, as it occurs after learning has taken place. For mentors guiding preservice teachers in Indonesia, it is important to emphasize the significance of both formative and summative assessments in the classroom. Understanding the distinctions between these assessment styles will enable preservice teachers to develop effective knowledge of reports, provide well-timed feedback to students, and make informed decisions about academic practices. Additionally, mentors can model the integration of formative assessment techniques into lesson planning and inspire preservice teachers to

use formative assessment to sustain student engagement and fulfillment.

For preservice teachers in Indonesia, understanding diverse formative assessment techniques and their effectiveness across various classroom settings is important for fostering a culture of continuous improvement and personalized learning. By learning these strategies, teachers can create inclusive and supportive learning environments that cater to the individual needs of their students and, ultimately, improve learners' knowledge and outcomes across the country.

- i. **Observations and Conversations:** This strategy involves the teacher actively observing students during classroom activities and engaging in small-group conversations to assess their understanding. Observations and conversations offer precious insights into individual student development and enable rapid feedback, making them highly effective for identifying areas for improvement and tailoring education to students' needs.
- ii. **Questioning Techniques:** Teachers use various questioning strategies, such as open-ended and probing questions and wait time, to assess learners' understanding and inspire critical thinking. Questioning techniques promote student engagement and may reveal misconceptions or gaps in knowledge, allowing teachers to adjust their teaching accordingly.
- iii. **Self-Assessment and Peer Assessment:** Students compare their landscapes with those of their friends using specific criteria. Self-assessment and peer assessment promote metacognition, collaborative learning, and deeper information about the getting-to-know objectives.
- iv. **Quizzes:** Short, focused assessments administered during the lesson to gauge

student comprehension. Quizzes offer immediate feedback on learners' knowledge and instructional decisions for the subsequent lesson.

- v. Performance Tasks and Projects: Students demonstrate their know-how through real-world global tasks and projects. Performance responsibilities and projects enable proper assessment of learners' capabilities and knowledge, catering to diverse learning styles and talents.

Each formative assessment strategy has its strengths and may be effective in various classroom settings. In Indonesian classrooms, observations and conversations are particularly powerful, as they allow teachers to build personal connections with students, understand their cultural backgrounds, and provide student-centered support (Zulfikar, 2021; Trotter, 2006). Questioning techniques encourage participation from all students, including those who can be more reserved in expressing their thoughts (Brookfield & Preskill, 2012). Self-assessment and peer assessment can foster collaboration and appreciation for various views among students (Ndoye, 2017). Quizzes can be tailored to address distinct proficiency levels and language competencies, ensuring that all students can demonstrate their knowledge. Performance duties and tasks provide opportunities for students to exhibit their skills and creativity, irrespective of their heritage.

2. Method

The research method employed a quantitative approach in the paper on formative assessment mastery in mentoring preservice teachers in Indonesia and utilized a systematic approach to ensure the inclusion of relevant and credible materials. The research begins by identifying key terms related to formative assessment, education, learning strategies, and

effectiveness. These keywords are used to search databases, journals, and scholarly sources. The researchers use reputable scholarly databases such as ERIC, JSTOR, PubMed, and Google Scholar to conduct research on academic articles, research papers, and publications on formative assessment and learning techniques. By examining the reference lists of key articles and studies, researchers can pinpoint seminal works and related research, thereby broadening the scope of the literature review. The process of selecting literature requires the use of specific criteria, including publication date (with an emphasis on more recent sources), relevance to the research topic, source authenticity, and the thoroughness of the research approach. The researchers employ reputable scholarly databases such as ERIC, JSTOR, PubMed, and Google Scholar to search for academic articles, research papers, and publications related to evaluating students' progress and strategies for acquiring knowledge. Inspecting the citation indexes of notable articles and studies enables researchers to uncover groundbreaking works and interconnected research, aiding in the expansion of the literature review.

The findings and conclusions from the selected sources help identify recurring themes, contrasting perspectives, and gaps in the existing literature that require attention. By following these systematic steps and rigorous research methodologies, researchers ensure that current literature is included in a comprehensive review of formative assessment strategies in education. By implementing a well-organized and encouraging mentorship initiative, aspiring educators can enhance their proficiency in formative evaluation under the supervision of seasoned mentors. This guide aims to facilitate this process by outlining the pairing criteria, selection process, and concrete interactions that contribute to the

professional development of preservice teachers in Indonesia.

The pairing process begins with the meticulous selection of mentors with the requisite skills and experience to guide preservice teachers effectively. Mentors are selected based on their proficiency in formative evaluation, instructional background, and interpersonal aptitudes. This selection process ensures that preservice teachers receive guidance from individuals who can provide valuable insights and support throughout their formative assessment journey. The interaction between mentors and preservice teachers is structured to facilitate meaningful learning experiences. Concrete terms of this interaction include regular meetings, observations, feedback sessions, collaborative planning, and reflection.

3. Result and Discussion

Formative assessment is of immense significance in effective pedagogical practice, particularly for aspiring educators who are actively refining their expertise and preparing for a vocation in education. Given the ongoing substantial reform of Indonesia's education system, it is imperative that mentors provide preservice teachers with the guidance and support needed to develop proficiency in using formative assessment methods. To provide a holistic understanding of the subject matter, the researcher substantiates the gathered data with tables and figures. To illustrate the research data on formative assessment mastery among preservice teachers in Indonesia, recent study information was evaluated to confirm their proficiency in formative assessment methodologies. The objective of the research was to understand the existing methodologies, challenges, and opportunities for improvement in this pivotal domain.

Table 1. Preservice Teachers' Familiarity with Formative Assessment Techniques

Formative Assessment Technique	Level of Familiarity (Scale: 1-5)
Self-assessment	4.2
Peer assessment	3.8
Feedback mechanisms	4.5
Goal setting	3.9

Table 1 above shows that preservice educators exhibit a notable degree of familiarity with feedback-delivery mechanisms, signaling an understanding of the importance of providing timely and constructive feedback to learners. Peer assessment appears to be an area where further training and support may be beneficial, as familiarity with it is relatively low compared to other techniques (Hata et al., 2021).

Table 2. Impact of Formative Assessment on Student Learning

Aspect	Percentage (%)
Improved student engagement	85
Enhanced learning outcomes	78
Tailored instruction	70
Student self-assessment	65

The information in Table 2 highlights the positive impact of formative evaluation on students' knowledge acquisition. Most individuals undergoing teacher training have witnessed improvements in student engagement, learning outcomes, and the ability to provide customized instruction. Moreover, a noteworthy proportion of learners have demonstrated improvements in self-assessment skills as a result of the use of formative evaluation strategies.

Table 3. Impact of Mentoring Programs on Formative Assessment Mastery

Mentoring Program Components	Effectiveness Rating (Scale: 1-5)
Peer Observation	4.3
Feedback Sessions	4.5
Lesson Planning Support	4.2
Reflective Practices	4.4

Table 3 outlines the impact of various mentoring program components on preservice teachers' mastery of formative assessment. It demonstrates the effectiveness of peer observations, feedback sessions, lesson-planning support, and reflective practices in improving preservice teachers' mastery.

Table 4. Challenges Faced by Preservice Teachers in Implementing Formative Assessment

Challenges	Frequency of Occurrence (Scale: 1-5)
Time constraints	4.3
Lack of training in formative assessment	3.9
Limited resources	4.5
Resistance from students	3.2

Table 4 delineates the aforementioned obstacles that preservice educators encounter when implementing formative assessment. The information indicates that factors such as insufficient instruction, limited resources, and time constraints pose significant barriers to the effectiveness of formative assessment methodologies. Moreover, a subset of preservice educators encounter opposition from students, thereby further complicating the implementation process (Konopasek et al., 2016).

In summary, it can be inferred from the research data presented that there is significance in guiding aspiring teachers in Indonesia as they endeavor to acquire proficiency in formative assessment. By tackling obstacles,

offering assistance, and highlighting the influence of formative assessment on student learning, mentors can steer preservice teachers towards achieving competence in this crucial facet of teaching. Formative assessment mastery is key to nurturing effective educators who can positively influence student outcomes and advance education in Indonesia (Mohamadi, 2018).

a. Assessing Preservice Teachers' Mastery of Formative Assessment

When mentoring preservice teachers in Indonesia, it is essential to have clear, comprehensive assessment criteria to evaluate their competence in formative assessment. These criteria serve as a guide for both mentors and preservice teachers, outlining the unique competencies and expertise that need to be tested for mastery of formative assessment. Adhering to well-defined criteria and processes for applying formative assessment will lead to the effective achievement of teaching and learning objectives for both teachers and students (Irons & Elkington, 2021). The clear parameters of formative assessment assist teachers in monitoring students' learning progress and evaluating their teaching approaches (Heritage, 2021). Failure to accurately implement formative assessment might hinder the effectiveness of teaching and learning.

The first thing in the assessment standards should be attention to the preservice teachers' know-how of the principles of formative assessment (Patthoff, 2022). This includes their knowledge of the purpose of formative assessment, its role in understanding the system, and the diverse strategies and techniques that may be used to collect evidence of students' learning. Preservice teachers should be capable of articulating the difference between formative and summative assessment and of demonstrating their

knowledge of how formative assessment informs educational decision-making.

The subsequent factor in the assessment criteria ought to address preservice teachers' ability to implement formative assessment techniques in the classroom. This consists of their ability to use strategies such as questioning, feedback, and observation to elicit evidence of student learning. Preservice teachers need to demonstrate their skill in creating and using formative assessments that align with introductory goals and provide valuable information on student progress (Ndoye, 2017). They also have to demonstrate an awareness of the importance of creating supportive, inclusive classroom environments that encourage student participation and risk-taking.

Another critical element of the assessment standards is the preservice teachers' capacity to analyze formative assessment data and respond to learner needs efficiently. This involves their ability to interpret assessment results, identify areas for student improvement, and use these data to inform their instructional planning. Preservice teachers must show proficiency in giving targeted feedback to students, adjusting their teaching methods based solely on assessment data, and tailoring procedures to meet the diverse needs of learners. They also need to demonstrate an understanding of how formative assessment can be used to foster student learning and self-regulation.

The very last detail of the assessment standards needs to be awareness of the preservice teachers' potential for reflective practice and expert growth in the vicinity of formative evaluation. This includes their capability to critically examine their practice, seek comments from mentors and peers, and engage in ongoing expert learning to enhance their formative assessment skills. Preservice teachers must exhibit a commitment to continuous improvement, an openness to new ideas and

approaches, and a willingness to adapt their practice primarily on the basis of evidence and feedback. Mentoring preservice teachers in learning formative assessment is a multifaceted approach that relies on feedback, comments, and self-evaluation tools. By providing a supportive and reflective environment, mentors can guide preservice teachers in developing the skills and knowledge necessary to effectively implement formative assessment practices in their future classrooms.

b. Challenges Faced by Preservice Teachers in Mastering Formative Assessment

The challenges faced by preservice teachers in mastering formative assessment are the difficulties encountered by individuals receiving training to become teachers in effectively understanding and implementing formative assessment techniques. This encompasses the barriers and obstacles that preservice teachers may encounter as they endeavor to grasp formative assessment and cultivate the capabilities necessary to implement it proficiently in an educational milieu. The journey of preservice teachers in mastering formative assessment can be challenging, yet resources and mentoring support can significantly help overcome these obstacles. Providing access to curated learning materials, such as online repositories of formative assessment tools, sample assessments, and best practices, can offer preservice teachers tangible resources (Xie & Cui, 2021). For example, platforms like TeachThought and Edutopia provide a wealth of formative assessment resources tailored for educators at various stages of their careers. Offering access to technology-enabled tools, such as digital assessment platforms or data analysis software, can empower preservice teachers to engage with formative assessment in contemporary ways. Tools like Kahoot!, Socrative, and Google Forms demonstrate

how technology can improve formative assessment procedures and enrich teacher-student interactions (Mohamadi, 2018). Sharing exemplar assessments and detailed rubrics can help preservice teachers understand the characteristics of effective formative assessments. Providing examples of well-constructed formative assessments for specific subjects or grade levels, along with corresponding rubrics, can elucidate the qualities of impactful assessment design.

c. Mentoring Support for Preservice Teachers In Formative Assessment Mastery

Pairing preservice teachers with experienced mentor teachers who excel in formative assessment practices can offer invaluable guidance. Through classroom observations, shared planning sessions, and reflective discussions, mentor teachers can model effective formative assessment strategies. For instance, a mentor teacher might demonstrate how to use questioning techniques to gauge student understanding during a lesson. Encouraging preservice teachers to interact with a collaborative expert who studies communities can bolster their formative evaluation skills. Participating in communities such as the National Science Teaching Association (NSTA) forums or subject-specific Twitter chats enables preservice teachers to seek advice, share experiences, and learn from the broader collective wisdom. Establishing structured feedback mechanisms, such as post-observation debriefs or everyday mentoring conferences, can provide preservice teachers with ongoing support and tailored guidance. By providing constructive feedback, preservice teachers may strengthen their formative assessment techniques by focusing on particular issues or areas for development in their teaching (Ghanizadeh et al., 2020).

d. Strategies for Mentoring Preservice Teachers in Formative Assessment Mastery

Formative assessment encompasses a range of techniques and strategies that teachers use to assess students' knowledge, learning needs, and educational progress throughout the instructional process (Moss & Brookhart, 2019). Unlike summative assessment, which measures students' academic success, formative assessment is ongoing and incorporated into the teaching and learning experience (Bennett, 2011). It affords valuable feedback to both teachers and students, fostering a collaborative approach to enhance learning outcomes. Mentoring preservice teachers in mastery of formative assessment entails equipping them with the knowledge, skills, and resources to effectively implement formative assessment practices in their future classrooms (Elshurafa, 2019).

By contextualizing strategies within the Indonesian educational context, mentors can effectively support preservice teachers in honing their assessment practices and enhancing student learning outcomes. Traditional assessment methods may not always resonate with Indonesia's diverse student population, making it imperative to explore innovative, culturally relevant assessment approaches. By providing continuous feedback, identifying misconceptions students may have, and adjusting instructional methods, formative assessment enables teachers to make well-informed decisions that support and advance student learning (Arrafii, 2020). Additionally, formative assessment fosters an atmosphere of continuous improvement, thereby motivating educators in training to reflect on their practice, refine their instructional techniques, and further enrich their professional growth. By incorporating culturally responsive practices into formative assessment strategies, mentors can assist educators in training to create

more meaningful and engaging learning experiences for their students. Mentors can cultivate a culture of shared learning and collective improvement by creating opportunities for educators in training to engage in reciprocal feedback, share effective practices, and collaborate on assessment-related tasks. This collaborative approach endorses a sense of unity and comradeship within the teaching community. Here are some strategies for steering preservice teachers in this vital area:

- I. Preservice teachers ought to obtain comprehensive education on the theoretical foundations and studies primarily based on practices of formative assessment. This includes expertise in assessment for learning, designing effective formative assessment tools, and interpreting assessment data to inform educational decisions.
- II. Mentors should provide opportunities for preservice teachers to observe and practice formative assessment techniques in classroom settings. Through formative assessment in action, they can understand its impact on students and learn to mirror its implications for their teaching practice.
- III. Encouraging preservice teachers to interact in reflective practice is essential for their growth. Mentors can facilitate ordinary reflection classes in which preservice teachers analyze their formative assessment experiences, identify strengths and areas for development, and set goals to refine their assessment practices.
- IV. Mentors can introduce preservice teachers to virtual tools and systems that guide formative assessment with online quizzes, data analysis software, and learning control structures.
- V. Encouraging a growth mindset that values continuous improvement, adaptation, and resilience in the face of

demanding situations can empower pre-service teachers to embody formative assessment as a dynamic and indispensable part of their teaching repertoire.

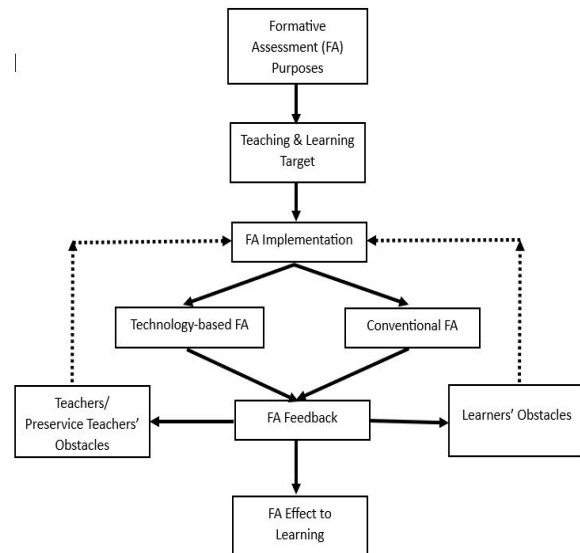


Figure 1. Illustration of Formative Assessment Setting Procedures

Modeling effective formative assessment techniques through classroom observations and demonstrations is a valuable tool for mentoring preservice teachers in Indonesia. By actively showcasing various assessment strategies, providing real-time feedback, integrating technology, emphasizing learner-centered assessment, and encouraging reflective practice, mentors can nurture a new generation of teachers who are adept at using formative assessment to enhance student learning and achievement (Bhardwaj et al., 2020). As mentors, you should encourage and guide preservice teachers on their journey towards mastery of formative assessment, contributing to the development of a more effective and responsive instructional system in Indonesia. Here are a few key procedures for formative assessment strategies:

- a. Through classroom demonstrations, mentors can showcase various formative assessment strategies, including peer

- assessment, self-assessment, and observation. By actively applying those techniques, preservice teachers can witness firsthand how each method provides specific insights into student learning and helps track progress. Additionally, mentors can illustrate how to adapt assessment strategies to distinct topics, grade levels, and learners' needs, emphasizing the flexibility and applicability of formative assessment.
- b. During classroom observations, mentors should exemplify the art of imparting real-time feedback to students. This involves demonstrating how to efficiently review and analyze student responses, identify misconceptions, and provide constructive feedback that promotes continuous improvement. Preservice teachers can learn from observing how well-timed, unique comments foster supportive learning environments and encourage student reflection and engagement.
 - c. Mentors should demonstrate the combination of eras in assessment through live demonstrations of virtual polling systems, interactive whiteboards, educational apps, and online assessment platforms. By incorporating the era into formative assessment, preservice teachers can observe how the equipment can enhance engagement, provide immediate data for decision-making, and streamline the assessment process.
 - d. Modeling student-focused assessment practices is critical for mentors guiding preservice teachers. By prioritizing student involvement in the assessment system, mentors can demonstrate how to empower students to take ownership of their mastery. This can be achieved through inclusive practices such as peer assessment, self-assessment, and collaborative purpose-setting, enabling preservice teachers to understand the value of learner involvement in shaping their educational journey.
 - e. In addition to modeling formative assessment strategies, mentors need to emphasize the importance of reflective practice. By openly reflecting on assessment practices, both successes and challenges, mentors can instill a culture of continuous development and lifelong learning in preservice teachers. Encouraging discussion of the effectiveness of various assessment techniques and their impact on students' learning can foster essential questioning and professional growth among future teachers.
- Encouraging preservice teachers to reflect on their formative assessment reviews and regulate their tactics is a crucial element of mentoring (Xie & Cui, 2021). Formative assessment mastery is a vital skill for teachers, as it enables them to identify students' learning needs and adapt their teaching to support individual growth. In the context of mentoring preservice teachers in Indonesia, techniques for developing formative assessment mastery must be tailored to the specific cultural and academic landscape (Farmasari et al., 2023). Mentoring preservice teachers in mastery of formative assessment begins with fostering a culture of reflective practice. Encouraging these teachers to critically evaluate their formative assessment experiences and recall the impact of their strategies on student learning is important. By engaging in reflective practice, preservice teachers can draw on deeper expertise in the strengths and weaknesses of their current procedures, paving the way for continuous improvement (Ghanizadeh et al., 2020). Mentors can provide preservice teachers with opportunities to design and implement formative assessment strategies in classroom settings. By observing the outcomes of their efforts and receiving

positive feedback, preservice teachers can refine their technique and develop self-belief in their ability to apply formative assessment effectively.

By placing students at the center of the assessment technique, preservice teachers can gain a deeper understanding of their needs and tailor their guidance accordingly. Mentors can guide preservice teachers in using several formative assessment techniques that prioritize student engagement and participation, including peer assessment, self-assessment, and collaborative learning. The integration of the era can enhance formative assessment practices and provide preservice teachers with valuable tools for collecting and analyzing student data. Mentors can introduce preservice teachers to digital systems and tools that facilitate formative assessment, enabling them to explore innovative approaches to gauging student development and adjusting their teaching techniques in response (Corral Abad et al., 2021). By harnessing the energy of generation, preservice teachers can amplify their repertoire of formative assessment methods and adapt to the evolving educational landscape. Mentoring preservice teachers in mastery of formative assessment also involves cultivating a growth mindset. Encouraging these teachers to include challenges, examine setbacks, and persist in their pursuit of excellence can foster resilience and a commitment to continuous improvement. By instilling a growth mindset, mentors can empower preservice teachers to view formative assessment as a dynamic, evolving skill set.

e. Leveraging Technology for Formative Assessment

The role of digital tools and structures in facilitating formative assessment is paramount in shaping the future of training, especially for preservice teachers in Indonesia. By embracing the era, harnessing data-driven

insights, personalizing learning, fostering collaboration, and overcoming boundaries, teachers can revolutionize the way they assess student development and power significant learning outcomes. As the digital landscape continues to evolve, preservice teachers need to be prepared with the expertise and skills to leverage this technology effectively, ultimately transforming the academic experience for students across Indonesia.

Digital tools and platforms offer preservice teachers innovative approaches to collecting, analyzing, and tracking student development, as well as providing timely feedback (Duncan & Barnett, 2009). These sources enable teachers to gain deeper insights into students' learning processes, identify areas for improvement, and tailor instruction to meet students' personal needs. By leveraging formative assessment for generation, preservice teachers can create a more inclusive and supportive learning environment, ultimately improving student outcomes. These tools enable preservice teachers to collect student responses, performance metrics, and other relevant information, providing a comprehensive view of each student's educational journey. By harnessing the power of data-driven insights, teachers could make informed instructional decisions, identify patterns and trends, and tailor learning experiences to optimize learner outcomes. Digital systems equipped with adaptive learning functions offer a customized approach to formative assessment. These platforms use algorithms to analyze student responses and behavior, ultimately adjusting the content and pacing of instruction to align with individual learning styles and competencies. Digital tools and structures additionally facilitate seamless communication and collaboration between preservice teachers, mentor teachers, and students (Bullock, 2013; Kivunja, 2013). Through online forums, instant messaging, and collaborative software,

teachers can exchange ideas, share resources, and provide ongoing support for one another. Additionally, these structures enable preservice teachers to engage in significant talk with their students, offering optimistic feedback, guidance, and encouragement to enhance their learning experiences. In a diverse academic landscape such as Indonesia, digital tools and systems can help bridge gaps in educational resources and aid (Bhardwaj et al., 2020). By leveraging technology for formative assessment, preservice teachers can overcome geographical barriers, reach far-flung students, and ensure that each student has equal opportunities to acquire a notable education (Kumaravadivelu, 2012). This inclusive approach not only benefits students but also empowers preservice teachers to adapt to various learning environments and innovate their pedagogical practices.

In the context of mentoring preservice teachers in Indonesia, leveraging technology for formative assessment of mastery can lead to more effective teaching and improved student learning outcomes. One of the benefits of integrating technology into formative assessment is the ability to collect real-time data on student learning and development. Using virtual tools, including online quizzes, interactive whiteboards, and educational apps, teachers can immediately gather data on their students' strengths and weaknesses. These instantaneous comments allow teachers to make timely academic adjustments to meet the various needs of their students, ultimately fostering a more personalized and responsive learning environment. Furthermore, technology-enabled formative assessment offers a possibility for accelerated learner engagement. Interactive structures and multimedia assets can make the assessment technique more interactive and enjoyable for students, thereby motivating them to actively participate in their learning (Corral Abad et al.,

2021; Regan & Sheppard, 1996). By incorporating gamified elements, multimedia content, and collaborative tools, teachers can create a dynamic and stimulating assessment experience that captures students' interest and promotes deeper learning (Fitria, 2022). Another key technology benefit of leveraging generation for formative assessment is the capacity for personalized and differentiated practice (Duckor & Holmberg, 2017). Through the use of getting to know control systems and adaptive knowledge of systems, teachers can tailor their teaching based totally on character student performance and learning patterns. This personalized method helps meet the diverse needs of students, incorporating targeted interventions and enrichment activities to address specific areas for improvement and success.

Moreover, integrating technology into formative assessment can facilitate the creation of more inclusive and accessible learning environments. For students with diverse learning needs, digital tools can offer features such as text-to-speech, adjustable font sizes, and multimodal content delivery. These accessibility features can help establish a learning environment for all newcomers, ensuring that each student has an equal opportunity to demonstrate their knowledge and receive meaningful feedback and instruction (Kumaravadivelu, 2012). In the context of mentoring preservice teachers in Indonesia, it's crucial to provide guidance and education on the effective use of technology for formative assessment. Mentors can guide new teachers in exploring and implementing a wide range of virtual tools and platforms that align with the Indonesian curriculum and academic standards. By modeling quality practices and sharing hands-on experience, mentors can empower preservice teachers to leverage technology to enhance their formative assessment

practices and improve student learning outcomes.

While technology has the capacity to augment formative assessment methods and enhance the quality of education, its integration also presents obstacles and constraints that require careful attention. By acknowledging and mitigating issues such as the digital divide, ethical considerations, and pedagogical implications, mentors and educators can foster a balanced and effective use of technology in formative assessment, ultimately benefiting both preservice teachers and their students. The digital gap poses a significant obstacle to the use of technology for formative assessment (Corral Abad et al., 2021).

In the context of mentoring preservice teachers in Indonesia, this digital divide can manifest in various ways, such as variances in access to devices and reliable internet connectivity among schools and students. When preservice educators are tasked with implementing formative evaluation practices that rely heavily on technology, such as online quizzes or digital portfolios, individuals who lack access to the required resources may be at a disadvantage. Consequently, this can result in unequal opportunities for students to learn and impede the effectiveness of formative assessment methods. Hence, mentors and instructors must be aware of the digital divide and endeavor to minimize its impact by offering alternative assessment approaches that do not rely exclusively on technology. One notable constraint when integrating technology into formative assessment is the moral considerations and privacy concerns that arise from the collection and retention of student data. In the era of digitalization, where student information is regularly stored in cloud-based systems and online platforms, prioritizing the protection and confidentiality of this data is of utmost importance. When mentoring preservice teachers in utilizing technology for

formative assessment, educators must emphasize the ethical considerations involved in data collection, particularly regarding sensitive information such as student performance metrics or personal details. Moreover, it is imperative to ensure compliance with data protection regulations and cultivate an environment that promotes conscientious data handling among prospective teachers. This is crucial to avert privacy infringements and uphold the bond of trust between educators, students, and their families.

Reliance on technology in formative assessment can also affect pedagogical practices and teaching methodologies. While technology offers innovative tools and platforms for conducting assessments, it may inadvertently shift the focus from holistic, student-centered learning to mere data collection and analysis (Prastikawati et al., 2020). When preservice educators excessively rely on technology for formative evaluation, there is a potential danger of overlooking the interpersonal dimensions of pedagogy and the varied requirements and learning styles of learners. Furthermore, the obligation to continually supervise and evaluate student progress through digital media may lead to a more standardized approach to instruction, potentially impeding creativity and personalized learning experiences.

f. Culturally Responsive Formative Assessment Practices

Culturally responsive formative assessment is an essential component of effective teaching in Indonesia's diverse educational landscape. As one of the most culturally and linguistically diverse countries in the world, Indonesia presents unique opportunities and challenges for teachers in designing assessment practices that accurately capture students' learning progress. Therefore, formative assessment should

extend beyond measuring academic achievement by recognizing and respecting the cultural backgrounds, experiences, and learning preferences of all students. Preservice teachers must be equipped with the competencies to design assessment practices that are inclusive, equitable, and responsive to the diverse cultural contexts in which learning takes place (Akhyar, 2023). Such an approach enables assessment to become a meaningful process that supports student development while promoting educational equity.

Within teacher education programs, mentors play a crucial role in helping preservice teachers understand that students' cultural identities significantly influence how they learn, communicate, and demonstrate their understanding. Students from different ethnic groups, linguistic backgrounds, and local communities may exhibit distinct learning behaviors and communication styles. Consequently, the use of standardized assessment methods alone may fail to provide an accurate representation of students' actual

competencies. Through systematic mentoring, preservice teachers can learn to recognize these differences and adapt their formative assessment strategies to ensure that every learner has an equal opportunity to demonstrate achievement.

Furthermore, culturally responsive formative assessment promotes greater student engagement by connecting learning activities with students' everyday experiences. When assessment tasks incorporate familiar cultural contexts, local examples, and authentic community issues, students are more likely to participate actively and confidently throughout the learning process (Hata et al., 2021). This contextualization strengthens the relevance of classroom instruction while enabling teachers to collect richer evidence of students' conceptual understanding. As a result, formative assessment functions not merely as an evaluative instrument but as an ongoing dialogue that supports continuous learning improvement.

Table 5. Key Principles and Implementation of Culturally Responsive Formative Assessment for Preservice Teachers

Principle of Culturally Responsive Assessment	Implementation in Classroom Practice	Benefits for Students	Mentor's Role in Teacher Preparation
Recognizing cultural diversity	Integrating local contexts, examples, and cultural references into assessment activities	Increases student engagement and strengthens cultural identity	Guides preservice teachers to understand students' cultural backgrounds
Providing flexible assessment methods	Combining presentations, discussions, portfolios, projects, and observations	Allows students to demonstrate learning through multiple forms of expression	Models authentic and differentiated assessment strategies
Encouraging collaborative learning	Facilitating peer assessment, group discussions, and collaborative reflection	Develops communication skills, teamwork, and mutual respect	Supports preservice teachers in implementing collaborative assessment
Incorporating local wisdom	Using local traditions, folklore, community issues, and indigenous knowledge as assessment contexts	Enhances learning relevance and contextual understanding	Assists preservice teachers in designing culturally meaningful assessment tasks

As presented in the Table 5, culturally responsive formative assessment encompasses more than simply modifying assessment instruments. It represents a comprehensive pedagogical approach that acknowledges students' diverse identities while ensuring fairness in evaluating learning progress. By adopting multiple assessment strategies, teachers can obtain more comprehensive evidence of student learning rather than relying solely on conventional written examinations. This diversified approach enables students with different strengths and communication preferences to demonstrate their understanding in meaningful ways.

An equally important aspect of culturally responsive assessment is the provision of multiple pathways for students to express their knowledge. Some learners communicate more effectively through oral presentations and collaborative discussions, whereas others demonstrate stronger performance through written assignments, visual representations, practical demonstrations, or project-based learning (Ihsani & Prastikawati, 2023). Allowing students to choose or experience different assessment formats creates a more equitable learning environment by reducing assessment bias associated with a single evaluation method. Such flexibility aligns closely with the principles of inclusive education and differentiated instruction, both of which seek to maximize every student's learning potential.

Integrating local culture into formative assessment also enriches the learning experience by making instructional content more authentic and meaningful. Assessment activities that incorporate local traditions, community practices, folklore, historical events, or environmental issues encourage students to connect theoretical concepts with their lived experiences. This contextual learning process not only improves

conceptual understanding but also strengthens students' appreciation of their cultural heritage. Consequently, formative assessment contributes simultaneously to academic development and character education by fostering respect for cultural diversity and local wisdom.

The mentoring process is fundamental in developing preservice teachers' competence in implementing culturally responsive assessment practices. Effective mentors provide opportunities for classroom observation, guided teaching practice, reflective discussions, and constructive feedback that enable preservice teachers to critically evaluate the inclusiveness of their assessment strategies (Kurth & Forber, 2017). Through continuous reflection, preservice teachers learn to identify potential cultural biases within assessment tasks and revise them to better accommodate diverse student needs. This iterative process encourages the development of adaptive, reflective, and evidence-based teaching practices.

Moreover, culturally responsive formative assessment contributes significantly to establishing inclusive classroom environments where all students feel respected and valued. When students recognize that their cultural backgrounds are acknowledged and incorporated into classroom activities, they are more likely to develop stronger motivation, higher self-confidence, and greater willingness to participate in learning (Akhyar, 2023). These positive learning dispositions provide teachers with more authentic evidence of student progress, allowing instructional decisions to be based on comprehensive and meaningful assessment information.

From a broader educational perspective, culturally responsive assessment also supports the implementation of Indonesia's educational goals, which emphasize equity,

diversity, and character development. The nation's multicultural context requires teachers who are capable of adapting assessment practices to accommodate diverse learner characteristics while maintaining high academic standards (Ihsani & Prastikawati, 2023). Therefore, teacher education institutions should integrate culturally responsive assessment principles throughout mentoring programs, ensuring that preservice teachers develop the professional competencies required for diverse classroom settings.

In conclusion, culturally responsive formative assessment represents a fundamental dimension of effective teacher preparation in Indonesia. Its successful implementation depends on preservice teachers' ability to understand students' cultural backgrounds, employ diverse assessment methods, integrate local contexts into learning activities, and continuously reflect on the inclusiveness of their instructional practices. Through systematic mentoring and sustained professional guidance, preservice teachers can develop assessment competencies that are valid, equitable, and culturally meaningful (Hata et al., 2021). Ultimately, these competencies enable future teachers to create inclusive learning environments that promote student engagement, support equitable educational opportunities, and enhance learning outcomes for all students while respecting Indonesia's rich cultural diversity.

4. Conclusion

In conclusion, mastery of formative assessment is a critical component of mentoring preservice teachers in Indonesia. By understanding the challenges and opportunities of implementing formative evaluation methodologies, mentors can guide aspiring teachers in developing their skills and proficiencies in

this domain. Through effective instruction, resource use, technology integration, and collaboration, aspiring teachers can refine their formative assessment practices and ultimately enhance their students' educational outcomes. From providing individualized feedback to promoting student engagement, from delivering targeted instruction to fostering a growth mindset, the benefits of mastery in formative assessment are far-reaching and transformative. By allocating resources to guide and support aspiring educators in acquiring skills for evaluating student progress, Indonesia has the potential to establish a more unbiased, comprehensive, and efficient educational framework that benefits all students. Furthermore, mastery of formative assessment enables teachers to provide timely and constructive feedback to students. This iterative feedback process nurtures a supportive educational atmosphere, wherein students are motivated to reflect on their performance and implement necessary improvements. Consequently, learners become more actively involved in the educational journey and are driven to attain scholastic supremacy. Furthermore, by mastering the art of formative evaluation, educators can craft more personalized educational experiences for their students. They can discern the distinctive strengths and weaknesses of each learner, enabling them to design tailored interventions that meet individual educational needs. This will enhance the learning experience for students and encourage a sense of inclusion and fairness in the classroom. Besides, when educators demonstrate proficiency in formative assessment techniques, they can effectively monitor students' progress over time. This longitudinal view of student development enables teachers to track growth, identify trends, and adjust their instructional strategies accordingly. By incorporating these strategies into teacher training curricula, we can enhance educators'

readiness to effectively meet the distinct learning needs of students in Indonesia. This proactive methodology has the potential to significantly enhance the nation's overall educational standards. The following suggestions are proposed for mentoring initiatives intended to assist preservice teachers in acquiring expertise in formative assessment: Adapt mentoring initiatives to meet the specific needs of preservice teachers at varying stages of formative assessment proficiency. Cultivate opportunities for collaborative work and peer observations to foster learning and the exchange of exemplary techniques among preservice teachers. Furnish continuous professional development opportunities for preservice teachers to enhance their comprehension of the principles and strategies of formative assessment.

5. Author Contribution

Entika Fani Prastikawati conceived the study, developed the research framework, designed the systematic literature review methodology, conducted the literature search, synthesized the findings, and prepared the original manuscript. Moses Adeleke Adeoye contributed to the conceptualization of the study, interpretation of the findings, critical review of the manuscript, and supervised the overall academic quality of the research. John Charles Ryan contributed to the interpretation and refinement of the literature synthesis, critically revised the manuscript for important intellectual content, improved the academic writing, and approved the final version for publication. All authors read and approved the final manuscript.

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