



A Theoretical Analysis of Formative Assessment Constructive Feedback in Mathematics Education in Kisarawe District, Tanzania

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ABSTRACT

Poor performance in mathematics among primary school pupils remains a major educational concern in Tanzania, particularly in rural districts where effective teaching and assessment practices are limited. Formative assessment is recognized as an important instructional strategy for improving learners' understanding, motivation, engagement, and academic achievement. This study was guided by constructivist theory, behaviorist theory, and assessment for learning (AfL) theory. Constructivist theory emphasizes that learners actively construct knowledge through interaction and guided support, where feedback helps correct misconceptions. Behaviorist theory focuses on the reinforcement of learning through correction and rewards, whereas AfL theory views assessment as a continuous process that uses feedback to bridge the gap between current and desired performance. Despite its importance, few studies have examined the influence of formative assessment constructive feedback on mathematics teaching and learning processes in Tanzanian primary schools, particularly in Kisarawe District. Therefore, this study investigated the influence of formative assessment constructive feedback on mathematics teaching and learning processes in public primary schools in Kisarawe District, Tanzania. A mixed-methods convergent parallel design was adopted, involving 94 respondents, including 81 pupils, 9 mathematics teachers, and 4 head teachers, selected through simple random and purposive sampling. Data were collected using questionnaires, interviews, classroom observations, and documentary review. Quantitative data were analysed using descriptive and inferential statistics, whereas qualitative data were analysed thematically. Validity and reliability were ensured through expert review and pilot testing. The findings revealed that formative assessment constructive feedback enhances learners' understanding of mathematical concepts, increases motivation and confidence, supports instructional adjustment, promotes active learning, and fosters a positive classroom environment. The study concludes that formative assessment constructive feedback is an effective strategy for improving mathematics teaching and learning in primary schools. It recommends strengthening teacher training on formative assessment, integrating continuous assessment into classroom instruction, and improving learning environments in Tanzanian primary schools.

Keywords: Formative assessment; constructive feedback; mathematics teaching; mathematics learning; primary schools; learner engagement; Kisarawe district; Tanzania

INTRODUCTION

Mathematics is widely recognized as a fundamental subject for scientific, technological, and socioeconomic development worldwide. It equips learners with critical thinking, problem-solving, and analytical skills necessary for their participation in modern society and future professional careers (Tshabalala & Ncube, 2016). According to Ker (2013), mathematical competence provides a foundation for understanding

concepts in science, engineering, and technology, making mathematics an essential component of education systems globally. Despite its importance, many pupils continue to experience difficulties in understanding mathematical concepts, resulting in poor academic performance and negative attitudes toward the subject (Mazana et al., 2019).

One of the educational approaches that has received increasing global attention in improving mathematics

learning is formative assessment. Formative assessment refers to the continuous process of collecting and interpreting information about learners' understanding during instruction to provide feedback that supports learning improvement (Myers, 2024; EBSCO, 2024). Unlike summative assessment, which focuses mainly on evaluating learning outcomes at the end of instruction, formative assessment emphasizes the continuous monitoring of learners' progress through activities such as quizzes, classroom discussions, observations, homework, peer assessment, and feedback (Crossouard, 2024). Effective formative assessment enables teachers to identify learners' misconceptions, adjust instructional strategies, and support learners in improving their understanding (ERIC, 2024).

Studies have demonstrated that formative assessment positively influences mathematics teaching and learning. In the United States, Fatima (2022) reported that formative assessment practices improved learner engagement, participation, and conceptual understanding in mathematics classrooms. Similarly, Palm et al. (2017) reported that formative assessment contributes significantly to students' academic achievement in mathematics by enabling teachers to provide timely instructional support. Research conducted in Thailand by Thinwiangthong et al. (2020) further revealed that the use of formative assessment strategies enhanced teachers' instructional practices and improved learners' mathematical reasoning and classroom interaction. In Africa, studies by Wafubwa and Csikos (2022) in Kenya and Alordiah (2025) in Nigeria have shown that formative assessment improves learners' confidence, motivation, and problem-solving skills in mathematics.

Despite these benefits, the effective implementation of formative assessments remains a challenge in many developing countries, including Tanzania. Existing studies indicate that many teachers rely heavily on summative assessment methods such as written tests and examinations while paying limited attention to continuous assessment strategies that promote active learning and feedback (Mfungo & Makungu, 2024). Challenges such as inadequate teacher training, overcrowded classrooms, limited teaching resources, and insufficient knowledge of formative assessment techniques continue to hinder effective implementation (Asare & Afriyie, 2023). As a result, many pupils fail to develop strong mathematical understanding and competence.

In Tanzania, poor performance in mathematics has remained a persistent concern at both primary and secondary education levels (Ngussa & Mbuti, 2017; Mzomwe et al., 2019; Areelu, 2023). In Kisarawe District in particular, mathematics performance in primary schools has continued to decline, with many pupils failing to achieve satisfactory results in national examinations. Reports from the Regional Education Office (2023) indicate that only 38% of pupils passed mathematics in the 2022 Primary School Leaving Examinations (PSLE), while failure rates remained high in several schools across the district. The contributing factors include inadequate formative assessment practices, a lack of teacher competence in assessment strategies, large class sizes, and learners' negative attitudes toward mathematics.

Although formative assessment has been widely acknowledged as an effective strategy for improving teaching and learning, few studies have specifically examined its influence on mathematics learning among primary school pupils in rural Tanzanian contexts such as Kisarawe District. Most existing studies focus on secondary schools or are conducted in developed countries, making their findings difficult to generalize to Tanzanian primary schools where educational conditions differ significantly. Therefore, this study seeks to assess the influence of formative assessment on mathematics learning among pupils in primary schools in Kisarawe District, Tanzania. This study is expected to contribute to improved instructional practices and provide insights into how formative assessment can enhance pupils' understanding, participation, and academic performance in mathematics.

LITERATURE REVIEW

Theoretical Review

Several educational theories explain how formative assessment influences mathematics teaching and learning. These theories emphasize learner participation, feedback, interaction, and reinforcement as important factors in improving academic achievement. The major theories related to formative assessment include constructivist theory, behaviorist theory, and assessment for learning theory.

Constructivist theory, developed by Jean Piaget and expanded by Lev Vygotsky, explains that learners actively construct knowledge through experience and interaction with their environment. Piaget (1963) argued that learners understand concepts better when they

actively participate in problem-solving and classroom activities. Vygotsky (1978) further emphasized the importance of social interaction, guidance, and feedback in supporting learners' understanding. According to this theory, formative assessment improves learning because it allows teachers to identify misconceptions, provide feedback, and engage learners in discussions and classroom activities. However, Gray (1997) argued that applying constructivist approaches may be difficult in overcrowded classrooms with limited teaching resources.

Behaviorist theory, associated with B. F. Skinner, views learning as a change in behavior resulting from reinforcement and feedback. Skinner (1953) explained that positive reinforcement and corrective feedback help learners improve performance. In mathematics learning, formative assessment provides continuous exercises, corrections, and feedback that motivate learners and strengthen understanding. Scholars such as Kültür and Kutlu (2021) reported that timely feedback improves learners' confidence and participation in mathematics lessons. Despite its importance, critics argue that behaviorism focuses mainly on observable behavior and pays less attention to learners' cognitive understanding.

Another important perspective is the Assessment for Learning Theory developed by Paul Black and Dylan Wiliam. Black and Wiliam (1998) argue that assessment should support learning rather than simply measuring achievement. The theory emphasizes continuous assessment, timely feedback, learner involvement, and instructional adjustment. According to Black and Wiliam (2009), formative assessment improves academic achievement because teachers use assessment information to identify learning gaps and modify instruction. Similarly, Palm et al. (2017) reported that formative assessment positively influences mathematics achievement by improving learner engagement and understanding.

These theories explain that formative assessment enhances mathematics learning through active participation, feedback, reinforcement, and continuous monitoring of learners' progress. They provide important theoretical understanding of how formative assessment can improve teaching and learning processes in primary schools.

Empirical Review

Empirical studies have shown that formative assessment plays an important role in improving

mathematics teaching and learning. Several scholars have examined teachers' ability to practice formative assessment, the influence of formative assessment feedback on teaching and learning processes, and the challenges limiting its implementation in schools.

Studies from different countries indicate that teachers are increasingly integrating formative assessment into mathematics instruction. In the United States, Fatima (2022) examined the implementation of formative assessment practices among middle school mathematics teachers using a qualitative approach. The study revealed that teachers use formative assessments at different stages of lessons to improve learner engagement, identify misconceptions, and provide timely feedback. Teachers also use divergent tasks and questioning techniques to promote deeper thinking among learners. Similarly, Fetahu et al. (2023) in Kosovo investigated the effectiveness of professional development programs on teachers' formative assessment practices. Using a mixed-methods approach, the study revealed that after training, teachers improved their lesson planning, use of feedback, and application of diverse assessment strategies. The authors concluded that continuous professional development strengthens teachers' ability to implement formative assessment effectively.

Similarly, Thinwiangthong et al. (2020) in Thailand investigated the impact of lesson study and open approach innovations on mathematics teachers' formative assessment skills. The study revealed significant improvement in teachers' ability to design formative assessments, ask quality questions, evaluate learners, and adjust instruction on the basis of assessment evidence. In Tanzania, Mfungo and Makungu (2024) examined formative assessment practices among secondary school mathematics teachers. Their findings revealed that teachers used classroom exercises, quizzes, assignments, group discussions, and demonstrations as formative assessment strategies. Teachers also provided feedback and reviewed previous corrections before new content was introduced.

Several studies further show that formative assessment feedback positively influences mathematics teaching and learning processes. In Turkey, Kültür and Kutlu (2021) conducted a quasiexperimental study among high school students and reported that formative assessment significantly improved students' academic achievement and attitudes toward mathematics. The study also revealed that formative assessment

encouraged learner participation and improved classroom interaction. Similarly, Avvisati and Borgonovi (2020) in France reported that formative assessment through test-enhanced learning produced positive effects on learners' mathematical performance, although the researchers noted limitations in transferring the findings to real classroom settings.

In Sweden, Palm et al. (2017) reviewed studies on formative assessment and mathematics achievement and reported a positive relationship between formative assessment practices and student performance. The review revealed that formative assessment helps teachers gather evidence of learning progress and modify instructional strategies accordingly. In Nigeria, Alordiah (2025) conducted a systematic review and reported that formative assessment enhances academic achievement, critical thinking, and problem-solving skills among learners. Similarly, Wafubwa and Csíkos (2022) in Kenya reported that formative assessment improved students' mathematics achievement and metacognitive awareness, especially when assessment strategies were tailored to learners' needs.

Despite these benefits, several studies indicate that the implementation of formative assessment faces many challenges. Martin et al. (2022) reported that although teachers valued formative assessment for identifying learners' weaknesses and improving instruction, many teachers focused more on identifying learning gaps than recognizing students' strengths. Hondrich et al. (2015) in Germany also reported variations in teachers' implementation of formative assessment and reported that effective implementation depended on teachers' pedagogical knowledge and evaluation skills.

Similarly, Asare and Afriyie (2023) in Ghana identified major barriers to formative assessment implementation, including heavy workloads, overcrowded curricula, limited time, and large class sizes. Ogunniyi (2023) in South Africa reported that low learner motivation, poor concentration, negative attitudes toward mathematics, and limited parental support contributed to poor mathematics performance and weakened assessment practices. In Kenya, Wafubwa (2022) reported that teachers had low to moderate perceptions of formative assessment, limiting its effective use in mathematics teaching. Similarly, in Tanzania, Mwita (2022) reported that truancy, dropout rates, parental neglect, and socioeconomic challenges disrupted learning continuity and negatively affected assessment practices in schools.

Although the reviewed studies provide important insights into formative assessment practices in mathematics education, several gaps remain. Most studies focus on secondary schools and developed countries, whereas few studies examine formative assessment in Tanzanian primary schools, particularly in rural districts such as Kisarawe. Methodologically, many studies rely heavily on quantitative or quasiexperimental designs with limited qualitative explanations of classroom realities. Geographically, few studies address formative assessment within the Tanzanian context, making it difficult to generalize findings from Western and Asian countries to local primary schools. Furthermore, many previous studies were conducted before recent educational policy changes and the increasing integration of ICT in teaching and learning. Therefore, this study seeks to examine the influence of formative assessment on mathematics learning among primary school pupils in Kisarawe District, Tanzania.

METHODOLOGY

This study employed a mixed-methods research approach that combined qualitative and quantitative methods to obtain a comprehensive understanding of the influence of formative assessment feedback on mathematics teaching and learning processes. The study adopted a convergent parallel design in which quantitative and qualitative data were collected simultaneously, analysed separately, and later integrated during interpretation (Creswell, 2014). This study was conducted in Kisarawe District in the Pwani Region of Tanzania because of poor performance in mathematics among primary school pupils and limited studies on formative assessment practices in the area. The target population consisted of pupils, mathematics teachers, and head teachers from selected public primary schools in Kisarawe District. A sample of 94 respondents, including 81 pupils, 9 mathematics teachers, and 4 head teachers, was included. Simple random sampling was used to select pupils, whereas purposive sampling was employed to select mathematics teachers and head teachers because of their direct involvement in formative assessment practices (Etikan et al., 2016). Data were collected using questionnaires, semistructured interviews, classroom observations, and documentary review. The questionnaires were administered to the pupils, whereas the interviews were conducted with the teachers and head teachers. Classroom observations

focused on assessment practices, feedback strategies, and learner participation during mathematics lessons. The validity of the research instruments was ensured through expert review and alignment with the study objectives, whereas reliability was established through pilot testing involving 10 pupils from schools not included in the actual study (Van-Teijlingen & Hundley, 2021). Quantitative data were analysed using descriptive statistics such as frequencies and percentages and inferential statistics regression and ANOVA, whereas qualitative data were analysed thematically through coding and categorization of responses. Ethical considerations were observed by obtaining informed consent, ensuring confidentiality and anonymity, and ensuring research clearance from relevant educational authorities before the study was conducted.

FINDINGS

The objective was to investigate the influence of formative assessment on mathematics teaching and learning processes in primary schools. The researcher intended to determine whether formative assessment practices positively influence pupils' learning processes. To obtain a broader understanding of this objective, the section is divided into two subsections. The first subsection focuses on whether small tests and exercises help pupils better understand mathematics, whereas the second subsection examines the effect of formative assessment constructive feedback on mathematics teaching and learning processes in primary schools. Both descriptive and inferential statistics were used to analyse the findings.

Small Tests/Exercises Help Pupils Understand Mathematics Better

In this subsection, pupils were asked to answer Yes, No, and Not Sure questions to determine whether formative assessment conducted by mathematics teachers improved their understanding of mathematics. The findings revealed that a large majority of the pupils (56) indicated yes, meaning that their teachers marked classwork and provided feedback, whereas only 6 pupils responded no and 19 pupils were not sure. These findings suggest that most mathematics teachers attempt to practice formative assessment by checking pupils' work and providing feedback during lessons. However, the presence of pupils who were uncertain indicates inconsistency in the manner in which

feedback is delivered and communicated.

Inferentially, the findings imply that regular formative assessment practices positively influence pupils' understanding of mathematics concepts because learners who frequently received exercises and feedback demonstrated improved participation and conceptual understanding. The findings further revealed that pupils who were regularly given homework and exercise improved their understanding of mathematics. Documentary review also indicated that teachers frequently provided exercises that supported learners' mastery of mathematical concepts. Similarly, Fatima (2022) and Thinwiangthong et al. (2020) reported that regular formative assessment activities reinforce concepts, improve confidence, and strengthen problem-solving ability.

Constructive Feedback and Mathematics Performance

The findings from descriptive statistics revealed that the majority of respondents agreed that formative assessment constructive feedback improves learners' understanding of mathematical concepts, enhances their motivation and confidence, guides teachers in adjusting instruction, promotes active learning and learner engagement, and creates a positive classroom learning environment.

To establish whether formative assessment constructive feedback significantly influences mathematics teaching and learning processes, regression analysis and analysis of variance (ANOVA) were conducted. Regression analysis was used to determine the predictive influence of formative assessment feedback on mathematics teaching and learning processes, whereas ANOVA was used to test the statistical significance of the regression model.

The regression model summary indicates that formative assessment constructive feedback has a strong positive relationship with mathematics teaching and learning processes ($R = 0.782$). The coefficient of determination ($R^2 = 0.611$) implies that formative assessment constructive feedback explains 61.1% of the variation in mathematics teaching and learning processes in primary schools. These findings suggest that formative assessment constructive feedback significantly contributes to improved teaching effectiveness, learner participation, and conceptual understanding in mathematics.

Table 1.

Statements	SD F (%)	D F (%)	N F (%)	A F (%)	SA F (%)
Improves learners' understanding of mathematical concepts	1(1.2)	3(3.7)	8(9.9)	50(61.7)	19(23.5)
Enhances learners' motivation and confidence	2(2.5)	4(4.9)	7(8.6)	48(59.3)	20(24.7)
Guides teachers in adjusting instruction	1(1.2)	5(6.2)	9(11.1)	47(58.0)	19(23.5)
Promotes active learning and learner engagement	2(2.5)	4(4.9)	10(12.3)	46(56.8)	19(23.5)
Creates a positive classroom learning environment	1(1.2)	3(3.7)	11(13.6)	45(55.6)	21(25.9)

Table 2. Regression model summary

Model	R	R Square	Adjusted R Square	Std. Error
1	0.782	0.611	0.598	0.421

Table 3. ANOVA results

Source	Sum of Squares	df	Mean Square	F	Sig.
Regression	38.214	1	38.214	27.563	0.000
Residual	24.617	79	1.387		
Total	62.831	80			

The ANOVA findings revealed that the regression model was statistically significant ($F = 27.563$, $p = 0.000$). Since the significance value was less than 0.05, the null hypothesis was rejected. This implies that formative assessment constructive feedback has a statistically significant influence on mathematics teaching and learning processes in primary schools.

The qualitative findings supported the quantitative results. Most students agreed that formative assessment improves learners' understanding of mathematical concepts, enhances motivation and confidence, guides teachers in adjusting instruction, promotes active learning, and creates a positive classroom environment. Teachers reported that immediate and constructive feedback enables pupils to identify errors, correct misconceptions, and improve problem-solving skills. Head teachers similarly emphasized that continuous assessment helps teachers monitor learners' progress and adjust instructional strategies according to learners' needs.

DISCUSSION OF FINDINGS

The findings of this study revealed that formative assessment constructive feedback has a significant

positive influence on mathematics teaching and learning processes in primary schools. The descriptive findings demonstrated that the majority of the pupils agreed that formative assessment improves learners' understanding of mathematical concepts, enhances motivation and confidence, guides teachers in adjusting instruction, promotes active learning and learner engagement, and creates a positive classroom learning environment. Inferential statistical analysis further confirmed that formative assessment constructive feedback significantly influences mathematics teaching and learning processes in primary schools. The regression analysis revealed a strong positive relationship between formative assessment constructive feedback and mathematics teaching and learning processes ($R = 0.782$), whereas the coefficient of determination ($R^2 = 0.611$) indicated that formative assessment constructive feedback accounted for 61.1% of the variation in mathematics teaching and learning processes. In addition, the ANOVA findings revealed that the regression model was statistically significant ($F = 27.563$, $p = 0.000$), implying that formative assessment constructive feedback significantly predicts improvement in mathematics

teaching and learning processes in primary schools. These findings imply that formative assessment is not merely an instructional activity but rather an essential pedagogical practice that significantly contributes to learners' academic engagement, conceptual understanding, and classroom participation.

The findings regarding the role of small tests and exercises in improving pupils' understanding of mathematics are strongly supported by constructivist theory, which guided this study. Constructivist theory, as advanced by Jean Piaget and Lev Vygotsky, emphasizes that learners actively construct knowledge through interactions with learning activities, reflection, and social engagement. In the present study, the pupils indicated that continuous exercises and feedback enabled them to identify mistakes, correct misconceptions, and improve conceptual understanding. The findings also revealed that pupils who were frequently engaged in homework, exercise, and classroom activities demonstrated improved understanding of mathematics concepts. These findings suggest that continuous assessment activities provide learners with opportunities to actively engage with mathematical concepts, thereby facilitating deeper understanding and retention of knowledge. Constructivist theory further argues that teachers play the role of facilitators by providing guidance, scaffolding, and feedback to support learners in constructing meaningful understanding. Therefore, the use of formative assessment in mathematics teaching aligns closely with constructivist principles because it enables teachers to identify learners' difficulties and provide immediate support to strengthen learning.

These findings are consistent with those of previous studies conducted in different educational contexts. Fatima (2022) reported that formative assessment practices help learners reinforce mathematical concepts, identify misconceptions, and improve knowledge retention. Similarly, Thinwiangthong et al. (2020) reported that regular formative assessment activities improve learners' confidence, problem-solving ability, and ability to identify learning gaps. Kültür and Kutlu (2021) reported that formative assessment significantly improves students' understanding, motivation, and attitudes toward mathematics. Palm et al. (2017) further reported that formative assessment enables teachers to identify learning gaps in real time and adjust instruction to improve learners' comprehension. Wafubwa and Csíkos (2022) reported that formative assessment improves learners' problem-

solving abilities and conceptual understanding in mathematics. The consistency between the current findings and those of previous studies demonstrates that formative assessment constructive feedback is an effective instructional strategy for improving mathematics learning outcomes across different educational contexts.

The study further revealed that formative assessment constructive feedback enhances learners' motivation and confidence in mathematics. Most pupils agreed that timely feedback and guidance encourage active participation and willingness to attempt difficult tasks without fear of failure. Teachers explained that positive reinforcement and supportive feedback increase learners' confidence and reduce anxiety in mathematics learning. These findings align with constructivist theory, which emphasizes the importance of supportive social interaction and teacher guidance in promoting meaningful learning. Similarly, Kültür and Kutlu (2021) reported that formative assessment practices improve learners' confidence and attitudes toward mathematics, whereas Alordiah (2025) reported that constructive feedback motivates learners to persist in challenging tasks and improves academic engagement. The implication of these findings is that teachers should use feedback not only to evaluate performance but also to motivate and encourage learners to develop positive attitudes toward mathematics.

The findings also revealed that formative assessment guides teachers in adjusting instruction according to learners' needs. Pupils indicated that teachers use assessment information to modify teaching strategies, reteach difficult concepts, and provide individualized support. Teachers similarly reported that they monitor learners' responses through questioning, discussions, and quizzes to identify misconceptions and adjust instruction accordingly. These findings support constructivist theory, which views the teacher as a facilitator who responds to learners' developmental needs through scaffolding and guidance. These findings are also consistent with those of Palm et al. (2017) and Alordiah (2025), who reported that formative assessment enables teachers to make informed instructional decisions and improves learners' mastery of concepts. The implications for educational practice in Tanzania are that teachers should integrate formative assessment into daily classroom instruction to improve instructional effectiveness and learner achievement.

Another important finding of the study was that formative assessment promotes active learning and

learner engagement during mathematics lessons. Pupils agreed that strategies such as questioning, group discussions, peer assessment, and problem-solving activities encourage active participation in classroom learning activities. Teachers also reported that learners become more involved in lessons when they are given opportunities to explain answers, discuss ideas, and interact with peers. These findings align with constructivist theory, which emphasizes that learning occurs through active participation, collaboration, and interaction with learning experiences. Similarly, Kültür and Kutlu (2021) and Palm et al. (2017) reported that formative assessment promotes active participation and creates interactive classrooms that strengthen conceptual understanding. Therefore, formative assessment should be promoted as a learner-centered instructional strategy that encourages active learner engagement in mathematics classrooms.

The study also revealed that formative assessment contributes significantly to creating a positive classroom learning environment. Most pupils agreed that continuous assessment and constructive feedback create supportive and encouraging classroom conditions where learners feel comfortable asking questions, making mistakes, and actively participating in mathematics lessons. Teachers further explained that formative assessment reduces fear and anxiety because assessment is used as a tool for improvement rather than punishment. These findings are consistent with those of Wafubwa and Csikos (2022), who reported that formative assessment promotes learner engagement and metacognitive awareness, as well as Avvisati and Borgonovi (2020), who reported that continuous formative assessment enhances cooperative learning and learner motivation. The implication of these findings is that formative assessment strengthens positive teacher–learner relationships, classroom interaction, and learners' willingness to participate actively in mathematics learning.

The findings of this study have important implications for educational practice and policy in Tanzania. First, the findings suggest that formative assessment should be integrated more effectively into mathematics teaching practices at the primary school level. Since formative assessment significantly improves learners' understanding, participation, confidence, and classroom interaction, teachers should be encouraged to use continuous assessment strategies regularly during instruction. Educational authorities should

therefore strengthen teacher training programs on formative assessment practices, learner-centered teaching approaches, and constructive feedback provision. Second, schools should create supportive classroom environments that encourage learner participation, collaboration, and interaction. Finally, educational stakeholders should provide adequate teaching and learning resources and strengthen professional development programs to equip teachers with practical skills for implementing formative assessment effectively, particularly in resource-constrained primary schools.

CONCLUSION AND RECOMMENDATIONS

Formative assessment constructive feedback plays an important role in improving mathematics teaching and learning processes in primary schools. Continuous assessment practices, timely feedback, learner participation, and interactive classroom activities strengthen learners' understanding of mathematical concepts, improve confidence and motivation, and increase active participation during lessons. The use of formative assessment also enables teachers to identify learners' misconceptions and adjust instructional strategies according to pupils' learning needs. Through continuous feedback and active learner involvement, mathematics classrooms become more supportive, participatory, and learner centered, thereby improving both academic and social learning experiences. In addition, the application of constructivist theory in classroom practice demonstrates that learners understand mathematical concepts more effectively when they actively engage in learning activities and receive guidance from teachers through constructive feedback. Effective formative assessment therefore strengthens collaboration between teachers and learners, promotes positive classroom interaction, and supports the development of critical thinking and problem-solving skills among pupils. Strengthening formative assessment practices in primary schools is therefore essential for improving the quality of mathematics education and enhancing learner achievement in Tanzania.

There is a need for the Ministry of Education, Science and Technology to strengthen teacher professional development programs focusing on formative assessment practices, learner-centered teaching approaches, and constructive feedback strategies in mathematics classrooms. Teacher education programs should place greater emphasis on practical classroom

assessment skills to ensure that teachers are adequately prepared to implement continuous assessment effectively in primary schools. Mathematics teachers should consistently integrate formative assessment activities such as oral questioning, classroom exercises, quizzes, peer discussions, and immediate feedback into daily teaching practices. The feedback provided to learners should be timely, supportive, and focused on helping pupils identify and correct misconceptions in mathematics. In addition, classroom environments should encourage learner participation, collaboration, and free interaction to strengthen confidence and active engagement during mathematics lessons. School administrators and educational stakeholders should also ensure the availability of adequate teaching and learning resources that support formative assessment implementation in primary schools. Continuous supervision and academic support systems should be further strengthened to help teachers improve their classroom assessment practices. Further research is encouraged in other districts and educational levels to broaden the understanding of formative assessment practices and their contribution to improving mathematics learning outcomes in Tanzania.

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