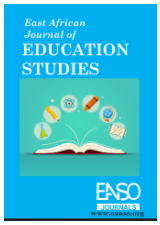
Article DOI: https://doi.org/10.37284/eajes.8.3.3576



East African Journal of Education Studies
eajes.eanso.org
Volume 8, Issue 3, 2025
Print ISSN: 2707-3939 | Online ISSN: 2707-3947
Title DOI: https://doi.org/10.37284/2707-3947



Original Article

Active Learning Strategies and Student Attitude Towards Mathematics in Government Secondary Schools in Ruhaama County, Ntungamo District

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Article DOI: https://doi.org/10.37284/eajes.8.3.3576

Date Published:

04 September 2025

Keywords:

Active Learning Strategies, Student Attitude, Mathematics, Government Secondary Schools, and Ruhaama County.

ABSTRACT

The study aimed to examine the relationship between active learning strategies and students' attitudes toward mathematics in government secondary schools in Ruhaama County. Specifically, the study aimed to identify the most commonly used active learning strategies in mathematics, analyse how students' attitudes differ by gender in mathematics, and establish the relationship between active learning strategies and students' attitudes toward mathematics. The study adopted a descriptive survey research design. A sample of 196 Senior Four (S.4) was selected through stratified random sampling, while all 12 teachers were purposively selected, with 10 participating. Questionnaires were administered to students, while semi-structured interviews were conducted with teachers. Data analysis was performed using SPSS version 25, generating descriptive statistics and inferential analysis. Findings revealed that the most commonly used strategies were group discussions (mean = 4.32), real-life examples (mean = 3.81), and peer teaching (mean = 3.67). The study concludes that active learning strategies significantly enhance students' attitudes toward mathematics and help bridge gender disparities in classroom engagement. It is recommended that schools promote the consistent use of strategies like group work, problem-solving, and peer teaching. Additionally, teachers should be supported with training and resources to effectively implement these approaches.

APA CITATION

Najuna, A., Aheisibwe, I. & Kabakyenga, A. (2025). Active Learning Strategies and Student Attitude Towards Mathematics in Government Secondary Schools in Ruhaama County, Ntungamo District. *East African Journal of Education Studies*, *8*(3), 425-436. https://doi.org/10.37284/eajes.8.3.3576

CHICAGO CITATION

Najuna, Abeth, Irene Aheisibwe and Asaph Kabakyenga. 2025. "Active Learning Strategies and Student Attitude Towards Mathematics in Government Secondary Schools in Ruhaama County, Ntungamo District." *East African Journal of Education Studies* 8 (3), 425-436. https://doi.org/10.37284/eajes.8.3.3576.

HARVARD CITATION

Najuna, A., Aheisibwe, I. & Kabakyenga, A. (2025), "Active Learning Strategies and Student Attitude Towards Mathematics in Government Secondary Schools in Ruhaama County, Ntungamo District", *East African Journal of Education Studies*, 8(3), pp. 425-436. doi: 10.37284/eajes.8.3.3576.

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Article DOI: https://doi.org/10.37284/eajes.8.3.3576

IEEE CITATION

A., Najuna, I., Aheisibwe & A., Kabakyenga "Active Learning Strategies and Student Attitude Towards Mathematics in Government Secondary Schools in Ruhaama County, Ntungamo District", *EAJES*, vol. 8, no. 3, pp. 425-436, Aug. 2025.

MLA CITATION

Najuna, Abeth, Irene Aheisibwe & Asaph Kabakyenga "Active Learning Strategies and Student Attitude Towards Mathematics in Government Secondary Schools in Ruhaama County, Ntungamo District". *East African Journal of Education Studies*, Vol. 8, no. 3, Aug. 2025, pp. 425-436, doi:10.37284/eajes.8.3.3576.

INTRODUCTION

Active learning strategies, which engage learners through methods such as group discussions, problem-solving, and project-based learning, have increasingly been recognised for their potential to enhance understanding and improve performance in mathematics. Globally, these approaches strengthen retention, critical thinking, and problem-solving abilities, making them vital for addressing challenges in mathematics education (Freeman et al., 2014; Ministry of Education and Sports [MoES], 2019).

In Uganda, the government has implemented initiatives such as the *Strengthening Education Systems for Improved Learning* (SESIL) program to promote learner-centred approaches and improve literacy and numeracy. SESIL, launched in 2018 with support from the UK government, emphasises structured lesson plans, teacher mentoring, and school-based supervision (MoES, 2019; Mott MacDonald, 2020). While these reforms have introduced innovative practices, challenges such as large class sizes, inadequate teaching materials, and negative student attitudes toward mathematics persist (Nsubuga et al., 2021; Ahimbisibwe, 2022).

In Ruhaama County, where socioeconomic constraints further limit access to learning resources, these challenges are even more pronounced. Recent reports indicate that mathematics failure rates in government secondary schools in the district exceed 70%, with fewer than 30% of students passing (Ntungamo District Education Office, 2022). Teacher-centred methods such as rote memorisation remain dominant, reducing learner participation. Active learning strategies, if effectively implemented, have the potential to make mathematics more relevant and engaging, thereby improving student attitudes and outcomes (Agyei & Voogt, 2019; Kabagambe, 2023).

Problem Statement

Mathematics education in government secondary schools in Ruhaama County, Ntungamo District, faces challenges such as low student engagement, negative attitudes, and poor academic performance. The district grapples with a mathematics failure rate of over 70%, as only 30% of students achieve a passing grade (Ntungamo District Education Office, 2022). While active learning strategies like group discussions and mathematical games were introduced in pilot programs in 2021, their district-wide implementation remains fragmented. Tumwine (2022) reported that approximately 70% of students in Ruhaama County lack interest in mathematics due to traditional, teacher-centred instructional methods. Furthermore, gender disparities, societal biases, and unequal access to learning resources disproportionately affect female students, reducing their participation in mathematics education and limiting their career opportunities in STEM fields.

Effective implementation of active learning strategies can enhance students' attitudes by making mathematical concepts more interactive, relatable, and less intimidating. Studies have shown that students who engage in active learning develop greater confidence, interest, and motivation in mathematics, ultimately leading to better academic performance (Mugisha & Obonyo, 2020). Conversely, when these strategies are not employed, students tend to disengage, develop negative perceptions, and struggle with

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Article DOI: https://doi.org/10.37284/eajes.8.3.3576

mathematical concepts, contributing to poor performance and high failure rates.

Despite efforts such as teacher training workshops, curriculum adjustments, and the introduction of educational resources like mathematical games, challenges persist, including inadequate resources, large class sizes, and insufficient government support. These barriers hinder the consistent application of active learning strategies, limiting their potential impact on students' attitudes. Therefore, this study sought to examine the extent to which active learning strategies influence students' attitudes toward mathematics in government secondary schools in Ruhaama County. This paper examined the most commonly used active learning strategies in mathematics in government secondary schools of Ruhaama County, Ntungamo District.

Main Objective of the Study

The main aim of the study was to examine the relationship between active learning strategies and students' attitudes toward mathematics in government secondary schools in Ruhaama County, Ntungamo District.

Specific Objectives

To examine the most commonly used active learning strategies in mathematics in government secondary schools of Ruhaama County, Ntungamo district

Research Questions

What are the most commonly used active learning strategies in government secondary schools of Ruhaama County, Ntungamo district?

Significance of the Study

This study is significant to multiple education stakeholders. For mathematics teachers, it provides insights into the effectiveness of active learning strategies such as group discussions, problem-solving, and inquiry-based learning in improving students' attitudes toward mathematics. The findings will guide teachers in selecting and applying student-centred instructional techniques that enhance learners' engagement and reduce anxiety toward the subject. Education administrators and school leaders will benefit by understanding the role of teacher training and classroom resource allocation in facilitating active learning, which can ultimately improve academic performance. Furthermore, the study contributes to academic literature by addressing the gap in localised evidence on how active learning influences students' attitudes toward mathematics in Ugandan government schools. Lastly, students are the ultimate beneficiaries, as improved teaching approaches can transform their perception of mathematics, increase participation, and support better learning outcomes.

LITERATURE REVIEW

Theoretical Review

The constructivist learning theory, championed by Jean Piaget (1950) and further developed by Lev Vygotsky (1978), posits that learners actively construct knowledge through interaction with their environment and social collaboration. This theory emphasises that learning is a dynamic process where students build understanding by engaging with new experiences, reflecting on them, and integrating them into their existing cognitive frameworks. Piaget's work focused on individual cognitive development, while Vygotsky introduced the concept of the "zone of proximal development," highlighting the role of social interaction and scaffolding in learning. Together, these ideas underscore the importance of active engagement and peer collaboration in meaningful learning.

The constructivist theory operates on the principle that learning is most effective when students are actively involved in the process rather than passively receiving information. It suggests that strategies like problem-solving, inquiry-based learning, and group discussions facilitate deeper understanding by allowing learners to explore,

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question, and collaborate. For instance, Vygotsky's emphasis on social interaction aligns with peer teaching and collaborative problem-solving, where students learn from one another under guided facilitation. This approach shifts the focus from teacher-centred instruction to student-centred exploration, fostering critical thinking and retention of knowledge.

Previous studies have applied constructivist theory to mathematics education, demonstrating its effectiveness in improving student attitudes and performance. For example, Freeman et al. (2014) found that active learning strategies, rooted in constructivist principles, significantly enhanced student engagement and achievement in STEM subjects. Similarly, Kogan and Laursen (2017) showed that inquiry-based learning, a constructivist approach, improved retention and critical thinking in mathematics. These studies highlight how constructivist methods make abstract concepts more relatable and reduce math anxiety by emphasising real-world applications and collaborative learning.

In this study, the constructivist theory was used to address the problem of negative attitudes and low engagement in mathematics among students in Ruhaama County. By examining active learning strategies such as group discussions, peer teaching, and problem-solving tasks, the study aligned with the theory's core tenets of active engagement and social interaction. The findings revealed that these strategies improved students' attitudes and bridged gender disparities, supporting the theory's assertion that collaborative and participatory methods enhance learning outcomes. Thus, the constructivist framework provided a robust foundation for understanding how active learning transforms mathematics education in resource-constrained settings.

Most Commonly Used Active Learning Strategies in Mathematics

Active learning strategies have garnered global attention due to their effectiveness in improving student engagement and performance in mathematics. Kogan and Laursen (2017) conducted a study on inquiry-based learning (IBL) in college mathematics classrooms across the United States. Their findings indicated that students exposed to IBL had a 17% higher retention rate of mathematical concepts than those taught through traditional lecture methods. The study also highlighted increased classroom participation and critical thinking skills among students engaged in active learning. Similarly, Stains et al. (2018) performed a large-scale analysis of teaching practices in STEM education, including mathematics, across 200 institutions worldwide. They found that active learning techniques, such as collaborative problem-solving and flipped classrooms, improved academic outcomes by 15% compared to lecture-only methods. The study emphasised the importance of professional development for teachers in adopting and sustaining these approaches.

Studies in African schools suggest that hands-on activities and peer learning are effective, particularly in resource-limited settings. For instance, Omwenga (2016) highlighted the success of mathematics games and activities in Kenyan secondary schools, which fostered students' interest and confidence in solving complex problems.

Omondi and Otieno (2019) assessed problem-based learning (PBL) in Kenyan secondary schools, finding a 25% improvement in students' problem-solving abilities and confidence. The study noted that PBL encouraged students to engage more deeply with mathematical concepts through real-world applications. Additionally, Chirwa et al. (2017) examined the impact of inquiry-based learning on mathematics education in Malawi. Their findings showed that students taught using IBL performed 20% better in standardised assessments than their peers in traditional classrooms. The researchers also reported a marked increase in students' enthusiasm for mathematics and their willingness to tackle complex problems.

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Article DOI: https://doi.org/10.37284/eajes.8.3.3576

Ngware et al. (2018) demonstrated that learner-centred pedagogies in East African classrooms significantly enhanced problem-solving and critical-thinking skills, while Adebayo and Suleiman (2020) reported that active learning interventions in Nigerian secondary schools improved mathematics achievement and fostered more positive student attitudes. Similarly, Freeman et al. (2014) confirmed, in a large meta-analysis, that active learning increases performance in STEM subjects by an average of 6%. These studies underscore that active learning not only improves academic outcomes but also enhances student engagement, provided teachers receive adequate professional development to apply these strategies effectively. In East Africa, Omwenga (2016) explored the use of mathematics games and peer-assisted learning in Kenyan secondary schools. The study found that these strategies increased student interest and confidence in tackling complex mathematical problems by 25%. Furthermore, the use of games significantly reduced mathematics anxiety, with 68% of students reporting improved comfort levels with solving equations after participating in game-based learning. The study also highlighted the cost-effectiveness of such methods in resource-constrained environments, as teachers could adapt locally available materials to design interactive games. Omwenga emphasised the necessity of addressing teacher workload and class sizes to maximise the benefits of these strategies.

In Uganda, a study by Kabunga (2020) analysed the use of inquiry-based learning and collaborative group work in mathematics classrooms in Ruhaama County, Ntungamo District. The findings revealed that students in collaborative learning environments demonstrated a 20% higher ability to solve real-life problems compared to those in traditional classrooms. The study also noted that inquiry-based learning fostered a sense of curiosity among students, leading to a 15% increase in active classroom participation. However, the implementation of these strategies faced challenges, such as large class sizes and limited teacher training. Kabunga recommended increasing government investment in teacher development programs and classroom resources to enhance the effectiveness of active learning strategies in mathematics education.

Yusuf and Afolabi (2019) reported that Nigerian secondary school students taught mathematics through Problem Based Learning (PBL) performed significantly better than those taught using conventional methods. Similarly, Saito et al. (2020) showed that PBL improved student engagement and collaboration in mathematics classrooms across multiple developing countries. Technology-enhanced learning interactive tools, such as GeoGebra and graphing calculators, engage students and make abstract concepts more accessible (Balakrishnan, 2017). Games and simulations, integrating games into lessons, have been found to reduce math anxiety and improve engagement (Wright, 2011). Collectively, these findings highlight the continued relevance of PBL in making mathematics more meaningful and applicable to real-life contexts.

METHODOLOGY

Research Design

The study employed a descriptive survey research design. This design was selected because it allows for the collection of both qualitative and quantitative data and helps in describing the current status of the variables under investigation without manipulating them. The design enabled the researcher to explore the relationship between active learning strategies and students' attitudes toward mathematics. Moreover, the descriptive design provides a snapshot of the population characteristics, which was important for making informed interpretations. This type of research design has previously been used successfully in similar educational studies across Uganda, with a return rate of usable responses above 85% in student-based surveys (Muwonge, 2021).

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Study Population

The target population comprised all senior four students and mathematics teachers from selected secondary schools in Ruhaama County, Ntungamo District. Specifically, the population included an estimated 400 senior four students and 12 mathematics teachers from 4 secondary schools. This population was chosen because senior four is a critical level in mathematics learning, forming the foundation for O-Level performance. Teachers were included because they are the primary implementers of active learning strategies, and their perspectives are essential for triangulating students' views.

Sample Size and Sampling Technique

A total sample of 196 students and 12 mathematics teachers was selected for the study. Four secondary schools in Ruhaama County were purposively selected based on their performance in mathematics and accessibility for data collection, ensuring representation of both high- and low-performing schools. Stratified random sampling was used to select students from each school, with the number of students drawn proportionally to the total enrollment in each school: 50 students from School A, 48 from School B, 50 from School C, and 48 from School D. This approach ensured that each school contributed fairly to the sample, enhancing the reliability and representativeness of the findings. Mathematics teachers were selected using purposive sampling, targeting those directly teaching the sampled students, resulting in a total of 12 teachers across the four schools. The Krejcie and Morgan (1970) sample size table was used to determine the student sample size, based on the total population of 400 students. Purposive sampling was used for teachers due to their small number and the researcher's intention to gather detailed insights from those directly involved in mathematics instruction.

Data Collection Methods and Instruments

The study employed a questionnaire for students and an interview guide for teachers. The student questionnaire included both closed-ended items measured using a five-point Likert scale and open-ended items to explore deeper perceptions of active learning. Teacher interviews were conducted face-to-face and audio-recorded to ensure accuracy in data capturing.

Validity and Reliability of Instruments

To ensure validity, the instruments were reviewed by two experts in educational research and adjusted based on their feedback. Construct and content validity were ensured through alignment with the research objectives and literature review. The questionnaire was pre-tested for validity and reliability in one school outside the study area. Reliability was confirmed through a pilot study, and the Cronbach's Alpha of 0.81 indicated strong internal consistency. This meets the commonly accepted threshold of 0.7 for educational research instruments (Mugenda & Mugenda, 2003).

Data Analysis

Quantitative data from the questionnaires were analysed using the Statistical Package for Social Sciences (SPSS) version 23. Descriptive statistics such as frequencies, percentages, means, and standard deviations were used to summarise the data. To examine the relationships between variables, such as the association between the use of active learning strategies and student attitudes toward mathematics, Pearson's correlation coefficient was computed. Qualitative data from teacher interviews were thematically analysed and used to support or contrast quantitative findings. This mixed-methods approach ensured a comprehensive interpretation of the results.

Ethical Considerations

Ethical clearance was sought from Bishop Stuart University Research Ethics Committee and permission to conduct the study was obtained from

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school heads. Participation was voluntary, and respondents were assured of confidentiality and anonymity. Informed consent was obtained from all participants, and students were briefed on the purpose of the study before completing the questionnaire.

FINDINGS OF THE STUDY

Demographics of Study Participants

This section presents the demographic characteristics of both student and teacher participants involved in the study conducted in government secondary schools of Ruhaama County, Ntungamo District. The demographic variables captured in this study include gender and age distribution of participants (students and teachers). Results are presented below.

Table 1: Gender Distribution of Study Participants

Variable	Category	Students		Teachers		Total	
		Frequency	Percent (%)	Frequency	Percent (%)	Frequency	Percent (%)
Gender	Male	84	42.9	6	60	90	43.7
	Female	112	57.1	4	40	116	56.3
	Total	**196**	**100.0%**	**10**	**100**	**206**	**100**

Of 206 study participants, 90(43.7%) were males and 116(56.3%) were females, indicating a female majority among study participants. Among the students (n = 196), 57.1% (n = 112) were female and 42.9% (n = 84) were male. In contrast, among the teachers (n = 10), 60% (n = 6) were male and 40% (n = 4) were female. These findings suggest that while female representation is dominant among learners, male teachers slightly outnumber their female counterparts.

Table 2: Age of Study Participants (Students) (n=196)

Age	Frequency	Percent (%)
18	34	17.3%
19	51	26.0%
20	41	20.9%
21	67	34.2%
22	3	1.5%
Total	**196**	**100.0%**

Results on the age distribution of student participants indicate that the majority were aged 21 years, representing 34.2% (n = 67) of the study participants. This was followed by participants aged 19 years at 26.0% (n = 51), and those aged 20 years, who made up 20.9% (n = 41). Participants aged 18 years comprised 17.3% (n = 34), while the least represented age group was 22 years, with only 1.5% (n = 3). The findings reveal that the majority of participants were within the typical upper-secondary school age range, suggesting that most were in their advanced stages of secondary education.

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Table 3: Age of Study Participants (Teachers) (n=9)

Age (Years)	Frequency	Percent (%)
18-28	3	30
29-38	5	50
39-48	1	10
48 and above	1	10
Total	10	**100**

The findings in Table 3 revealed that the majority were within the 29–38 years age bracket, accounting for 50% (n = 5) of the total sample. Participants aged 18–28 years comprised 20% (n = 3), while those aged 39–48 years and 48 years and above were each represented by only 10% (n = 1). These results suggest that most of the mathematics teachers in the study are relatively young and within their early or mid-career stages, which may influence their openness to adopting innovative teaching strategies such as active learning methods.

Most Commonly Used Active Learning Strategies in Mathematics in Government Secondary Schools of Ruhaama County, Ntungamo District

This section presents findings on the active learning strategies most commonly employed in the teaching of mathematics. Results are presented in Table 4.

Table 4: Most Commonly Used Active Learning Strategies in Mathematics

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Std Dev
Group discussions help me better understand mathematical concepts.	5 (2.6%)	3 (1.5%)	17 (8.7%)	70 (35.7%)	101 (51.5%)	4.32	0.891
Problem-solving tasks make mathematics lessons more engaging.	7 (3.6%)	27 (13.8%)	58 (29.6%)	58 (29.6%)	46 (23.5%)	3.56	1.101
Teachers frequently use real-life examples in mathematics lessons.	14 (7.1%)	18 (9.2%)	33 (16.8%)	57 (29.1%)	74 (37.8%)	3.81	1.236
Peer teaching improves my confidence in solving mathematics problems.	16 (8.2%)	19 (9.7%)	45 (23.0%)	49 (25.0%)	67 (34.2%)	3.67	1.263
Technology tools, like geometry software, are used in our mathematics class.	34 (17.3%)	35 (17.9%)	33 (16.8%)	36 (18.4%)	58 (29.6%)	3.25	1.479
Games and puzzles are integrated into mathematics lessons.	41 (20.9%)	42 (21.4%)	38 (19.4%)	40 (20.4%)	35 (17.9%)	2.93	1.405
Inquiry-based learning makes mathematics more interesting for me.	15 (7.7%)	30 (15.3%)	44 (22.4%)	52 (26.5%)	55 (28.1%)	3.52	1.259

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Overall

Group discussions were rated highest, with 87.2% of students agreeing they enhance understanding. Only 8.7% were neutral and 4.1% disagreed. The high mean of 4.32 and low standard deviation (0.891) indicate strong consensus. Real-life examples were also well-rated, with 66.9% agreement, though variation existed (mean = 3.81, SD = 1.236). Peer teaching received 59.2% agreement, but responses varied (mean = 3.67, SD = 1.263), suggesting effectiveness may depend on group dynamics.

Problem-solving tasks were supported by 53.1% of students, with many neutral (29.6%) or disagreeing (17.4%). The mean of 3.56 shows moderate agreement. Inquiry-based learning had 54.6% support, but 45 students (23%) disagreed, pointing to uneven application (mean = 3.52). These results suggest potential for growth in how these strategies are used.

Technology tools and games received the lowest support. Only 48% agreed on tech use in class, while 35.2% disagreed (mean = 3.25, SD = 1.479). Games and puzzles had just 38.3% agreement, with 42.3% disagreeing (mean = 2.93). Overall, the average rating across strategies was 3.15, showing moderate application and signalling the need for better resource use and teacher support.

In qualitative analysis, the responses collected from teachers about the most commonly used active learning strategies in mathematics in government secondary schools of Ruhaama County, Ntungamo district, were as follows;

When asked *"How frequently do you use active learning strategies like group work, problem-solving, or discussions in your mathematics classes?"*, teachers provided varied responses. In School A, Participant 1 stated they use *"group work"*, while Participant 2 admitted they use such strategies *"rarely."* However, Participant 3 claimed to employ them *"always."* When probed further about which strategies were most effective, Participant 1 preferred "*discussion,"* whereas Participants 2 and 3 both emphasised *"group discussion."*

All participants from school B reported frequent use of active learning. Participant 1 explained, *"Every lesson, I use problem-solving or discussion group work,"* while Participant 3 noted, *"I use active learning almost every lesson."* Regarding effectiveness, Participant 1 favoured *"group work,"* while Participants 2 and 3 highlighted *"group discussion"* and *"group work,"* respectively.

School C teachers demonstrated strong consistency. Participant 1 said, *"During every teaching lesson-group work and problem-solving,"* and Participant 3 added, *"All the time during my mathematics lessons, especially group work and discussions."* When discussing effectiveness, Participant 1 mentioned *"group work and problem-solving,"* Participant 2 cited *"group discussions and guided discovery,"* and Participant 3 listed *"group work, problem-solving, and peer teaching."*

School D had limited responses, but Participant 1 confirmed using active learning *"always"* and found *"group discussion*" most effective. Overall, it was indicated that group-based methods dominate, but implementation varies from *"rarely"* to *"always."*

DISCUSSION OF RESULTS

The first objective of the study was to identify the most commonly used active learning strategies in mathematics in government secondary schools of Ruhaama County, Ntungamo District. The results indicate that group discussions are the most frequently employed and appreciated strategy, with a mean score of 4.32 and 87.2% of respondents agreeing or strongly agreeing. The low standard deviation (0.891) suggests strong consensus among students regarding its effectiveness. This finding demonstrates that, in line with the study objective, collaborative learning through group discussions is the primary approach teachers adopt to engage

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Article DOI: https://doi.org/10.37284/eajes.8.3.3576

students. Literature supports this, noting that group-based methods foster deep engagement and can mitigate resource limitations (Kogan & Laursen, 2017; Chirwa et al., 2017). Qualitative interviews reinforce that teachers rely on group work to enhance student understanding and attitudes toward mathematics.

Real-life examples emerged as another widely used strategy, with 66.9% of students acknowledging its use (M = 3.81, SD = 1.236). This aligns with the study objective by showing that teachers often integrate contextualised examples to make mathematics more relevant, though variations in implementation exist across schools. Literature confirms that real-world applications increase motivation and engagement (Omondi & Otieno, 2019; Kabunga, 2020).

Peer teaching, reported by 59.2% of students (M = 3.67, SD = 1.263), also contributes to achieving the study objective, highlighting its role as a supplementary strategy. Interviews show that peer-led instruction is more prominent in schools where structured group roles are in place, demonstrating moderate adoption in Ruhaama County.

Problem-solving activities (M = 3.56, 53.1% agreement) and inquiry-based learning (M = 3.52, 54.6% agreement) were moderately used. While these strategies address the objective by identifying additional methods employed, the results indicate inconsistent application, likely due to limited teacher training, time constraints, or large class sizes. The literature supports their potential for enhancing problem-solving and critical thinking when properly facilitated (Omondi & Otieno, 2019; Chirwa et al., 2017; Vygotsky, 1978).

Technology-based learning (M = 3.25, 48% agreement) and games and puzzles (M = 2.93, 38.3% agreement) were the least commonly used strategies, reflecting limited adoption in Ruhaama County. This directly informs the study objective by showing which active learning methods are underutilised. Interviews confirmed the minimal use of these approaches, highlighting barriers such as a lack of devices, internet access, and teacher awareness (Balakrishnan, 2017; Wright, 2011; Omwenga, 2016).

CONCLUSIONS

The study revealed that while a variety of active learning strategies are employed in teaching mathematics in government secondary schools of Ruhaama County, group discussions were perceived by students as the most commonly used and most effective method. With a high mean score (M = 4.32, SD = 0.891) and 87.2% of learners indicating agreement, group discussions were consistently ranked highest in terms of perceived usefulness in enhancing understanding of mathematical concepts. Other strategies, including problem-solving tasks, peer teaching, real-life examples, and inquiry-based learning, were moderately perceived as effective, though students reported variability in their use and impact across different schools and classrooms. Strategies such as the use of technology tools and the incorporation of games and puzzles were perceived as the least utilised and least effective, suggesting possible resource limitations and gaps in teacher training. Overall, while students report a positive trend in the adoption of active learning methods, the perceived differences in effectiveness across strategies highlight the need for more structured and consistent integration to ensure equitable use in mathematics teaching.

Therefore, it is recommended that the Ministry of Education and Sports, in collaboration with district education authorities, prioritise the professional development of mathematics teachers in Ruhaama County by organising targeted training workshops on the effective and consistent application of active learning strategies. For example, workshops could include hands-on sessions on designing collaborative group activities, integrating real-life examples from local contexts, and structuring peer-teaching exercises. Emphasis should be placed on enhancing the use of underutilised but potentially

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Article DOI: https://doi.org/10.37284/eajes.8.3.3576

impactful strategies, such as educational technology tools (e.g., GeoGebra, graphing calculators) and mathematical games or puzzles, by providing step-by-step guidance on lesson integration. Additionally, schools should be supported with the necessary digital infrastructure, including projectors, tablets, or offline educational software, as well as adequate instructional materials like manipulatives and locally relevant problem sets, to implement these strategies effectively. Regular monitoring visits by district education officers and the establishment of peer-learning forums or communities of practice, where teachers share lesson plans, challenges, and successful strategies, can further promote the consistent adoption of active learning, ensuring it becomes a standard and equitable practice across all government secondary schools in the district.

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