



**INSTRUCTIONAL MATERIALS USAGE AND LEARNERS' ACQUISITION OF
MATHEMATICS COMPETENCE IN UPPER PRIMARY, A CASE STUDY OF
BULAMAGI SUB COUNTY, IGANGA DISTRICT.**

BY

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**A RESEARCH REPORT SUBMITTED TO THE DEPARTMENT OF SCIENCE AND
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Declaration



I KASIISA STEPHEN hereby declare that this report on instructional material usage on learners' acquisition of mathematics competence in upper primary, a case study of Bulambuli sub-county, Iganga district is my original work and it has never been submitted to any institution for any award.

Signature. 

Date. 24/09/2024

Approval

This is to certify that the study by **KASIISA STEPHEN** has been under my close supervision and guidance as a university Supervisor.

Sign.......... Date..........

Mr. ANTHONY WANYAMA

Dedication

I dedicate this research to all lecturers in the faculty of science and education Nagongera Campus, my family Mzee Doctor Fred Kasiisa, my head teacher madam Magrete Mabangi for her financial support and my colleagues especially Justine Munalwa for her encouragement and moral support towards this course and not forgetting my research assistant Andrew Okoboi.

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List of Abbreviations and Acronyms

| | |
|------|---------------------------------------|
| IM | Instructional Materials |
| MIM | Mathematics Instructional Materials |
| MoES | Ministry of Education & Sports. |
| PLE | Primary Leaving Examinations. |
| UNEB | Uganda National Examinations Board. |
| USA | United States of America |
| FPE | Free Primary Education |
| ICT | Information communications Technology |
| ESSP | Education Sector Strategic Plan |

Abstract

This study assessed the factors influencing instructional material usage and learner's acquisition of mathematical competence in upper primary, focusing on Bulamagi Sub County, Iganga District. The objectives included identifying the types of instructional materials available, examining their utilization during mathematics instruction, and establishing the influence of these materials on the development of mathematical competencies. A cross-sectional survey design was employed, providing a systematic and factual description of data. The sample size of 80 respondents was determined using Krejcie and Morgan's (1970) table for sample size determination at a confidence level.

The findings revealed that 25% of respondents agreed and 20% strongly agreed that they used concrete manipulatives such as counting blocks or geometric shapes in their mathematics lessons. Additionally, 21% of respondents agreed and 31% strongly agreed on the utilization of audiovisual materials such as educational videos or podcasts to enhance mathematical learning. Regarding the integration of digital simulations or interactive multimedia resources, 25% of respondents agreed and 20% strongly agreed.

The study concluded that there was a significant reliance on various instructional materials for teaching mathematics in upper primary, with a notable preference for concrete manipulatives, printed materials, audiovisual aids, and digital tools. While a gender disparity among respondents was noted. The study recommended that teachers receive ongoing professional development on effectively integrating various instructional materials, including digital tools and audiovisual aids, to maximize their impact on student learning.

Chapter one

Introduction

1.0 Introduction

This chapter presents the background of the study, the statement of the problem, purpose of the study, specific objectives, research questions, scope of the study, significance of the study, and conceptual framework.

1.1 Background to the study

The background of this research report was presented in four ways, i.e. the historical background, conceptual background, theoretical background and contextual background .

1.1.1 Historical background

Globally, research conducted in developed nations such as the United States of America (USA), Europe, and Uruguay has highlighted the widespread adoption of instructional materials (IM) in mathematics education. For instance, a study focusing on enhancing mathematical instruction in short-term facilities in Washington DC, USA, conducted by Leone, Wilson, and Mulcahy (2010), underscored the significance of creating an inclusive classroom environment. The study revealed that learners' active engagement in mathematics activities and learning was positively influenced by the inclusiveness of the classroom setting, facilitated by the use of various instructional materials. These materials not only promoted active participation among learners but also fostered a positive attitude towards classroom activities, thereby creating conducive learning conditions and stimulating learners' interest and curiosity in the subject matter.

Similarly, in sub-Saharan Africa, research indicates a growing acceptance and utilization of instructional materials in the teaching and learning process, with tangible impacts observed. Iji, Ogbole, and Uka (2013), emphasized the positive effect of appropriate improvised instructional materials on the acquisition of mathematical concepts, leading to improved mean achievement scores among learners. Additionally, Guloba, Wokadala, and Bategeka (2010) highlighted the role of teaching resources in enhancing the quality of education, underscoring the importance of employing suitable instructional materials to facilitate active understanding rather than rote learning. The absence of adequate and appropriate instructional materials risks promoting

passive learning, as emphasized by Machaba (2013). Instructional materials not only bring joy to teachers but also foster enthusiasm among learners, facilitating self-discovery and promoting child-centered approaches to teaching and learning, as advocated by UNICEF (2014).

In East Africa, the provision of instructional materials remains significantly inadequate, affecting the effective implementation of the curriculum, as noted by Eshwani (2016). Ruth, Eduard, and Alex (2015), further highlight the adverse impact of insufficient teaching materials on educational service delivery and learners acquisition of mathematics competence in public secondary schools in Kenya. Okumbe (2016) stresses the pivotal role of teachers in curriculum delivery and emphasizes the need for quality teaching materials to enhance learner's acquisition of mathematics competence.

In Rwanda, education is recognized as a fundamental right essential for national development and poverty reduction (MINEDUC, 2018). Despite facing challenges following the 1994 genocide, Rwanda prioritized investments in education and human resources, aiming to rebuild the education system and achieve development goals outlined in the Education Sector Strategic Plan (ESSP, 2010). Additionally, Rwanda committed to meeting international development targets such as Education for All (EFA) and reducing gender inequality in education, demonstrating its commitment to providing quality education through the provision of relevant textbooks and curricula.

In Ugandan schools as in many others worldwide, the utilization of instructional materials (IM) is widely embraced as a fundamental aspect of teaching and learning. According to the Ministry of Education and Sports (2018), the use of IM plays a crucial role in promoting learners acquisition of mathematics competence among learners. Okello and Okello (2010), further support this notion by highlighting that the integration of Information and Communication Technology (ICT) during lesson delivery leads to increased learner participation, ultimately resulting in higher academic retention rates. Conversely, Okongo (2015), emphasized that the absence of adequate and appropriate IM often leads to abstract teaching practices in subjects such as mathematics, contributing to passive learning experiences for learners. This passive approach to learning, as noted by Wambua (2018), can result in poor acquisition of Mathematics competence among learners.

On a more positive note, Kariuki (2013), asserted that the effective utilization of IM enhances teaching practices, enriches lesson plans, and caters to the diverse needs of learners. By addressing different learning styles and preferences, IM positively impact both learners and overall Mathematics competence and school performance. He added that their unavailability cripples acquisition of the key aspects of education.

1.1.2 Conceptual background

Instructional materials usage refers to the utilization of various resources, tools, and aids designed to support teaching and learning activities in educational settings. These materials encompass a wide range of resources, including textbooks, workbooks, multimedia presentations, audio-visual materials, manipulatives, and digital resources, among others. (Orey & Branch, 2017).

Instructional materials play a crucial role in facilitating learners' acquisition of mathematics competence. These materials, which can include textbooks, workbooks, manipulative, multimedia resources, and other aids, provide learners with opportunities to engage actively with mathematical concepts, develop problem-solving skills, and deepen their understanding of mathematical principles (Magoma, 2016).

Learners' acquisition refers to the process through which individuals gain knowledge, skills, attitudes, and understanding in various subject areas or domains. It encompasses the acquisition of new information, the development of competencies, and the internalization of concepts or principles that contribute to overall learning and growth (Goktepe, 2013).

Mathematics competence refers to an individual's ability to understand, apply, and communicate mathematical concepts, principles, and procedures effectively in various contexts. It encompasses both procedural fluency, or the ability to perform mathematical operations accurately and efficiently, and conceptual understanding, or the comprehension of underlying mathematical ideas and relationships (Nyamongo, 2014).

Acquisition of mathematical competencies this is grasping the concepts or the understanding of mathematical concepts by learners. The use of instructional materials during instruction facilitated the understanding of skills (Dale, 2019).

1.1.3 Theoretical background

This research will be guided by Jerome Bruner's Theory of Instruction (1966). Bruner advocated for the development of autonomous learners who have the ability to create knowledge independently. He argued that the primary goal of schooling should be to produce problem solvers and critical thinkers rather than merely imparting concepts and categories dictated by cultural norms. Bruner (1966) proposed that for knowledge to be effectively stored and encoded in memory, learning should progress from enactive to iconic to symbolic representation of the surrounding world, which he termed as "three modes of representation.

Bruner (1966) emphasized the importance of appropriately organized instruction in facilitating the acquisition of concepts. He asserted that learners, even at a very young age, are capable of grasping complex mathematical concepts if instruction is well-organized. One method of organizing instruction is by providing suitable instructional materials. According to Bruner's framework, grade one learners typically fall between the iconic and symbolic representation stages. Therefore, they benefit from instructional approaches that incorporate manipulative materials, illustrations, and symbols. Teachers play a crucial role in ensuring the availability of diverse instructional materials to fully engage learners in the learning process and enhance their acquisition of mathematics competencies. By utilizing a variety of instructional materials, educators can cater to different learning styles and promote active participation among learners.

1.1.4 Contextual background

The study will concentrate in Bulamagi Sub County located in Iganga District in the Eastern Region of Uganda. It is one of the 9 sub-counties that make up Iganga District. Bulamagi Sub County has a population of approximately 30,000 people and covers an area of about 82 square kilometers. The sub-county is located about 6 kilometers southeast of Iganga town, the main commercial and administrative center of the district. The area is primarily rural and agriculture is the main science activity. The sub-county has several small trading centers, health centers, tertiary institutions and primary schools. Records from Bulamagi sub county Education Department (2023), revealed that 87% of the learners in upper primary had limited access to instructional materials like text books, workbooks, manipulative, multimedia resources, and other aids. These has led to high number of learners in the sub county failing poorly in mathematics subject during Primary leavening Examination of 2022 -2023 (PLE).Despite

government interventions like the provision of scholastic materials, provision of infrastructure like library. It is true that the government had spent a lot of money in provision of instructional materials as evidenced by the records held by the Iganga Education Officer (2022), on quarterly and annual reports on account meant for procurement of instructional materials. Much as the government of Uganda had done a lot there is still low acquisition of mathematical competencies among learners. This has prompted the researcher to conduct the study on the factors influencing instructional material usage and learners' acquisition of mathematics competence in upper primary in Bulamagi sub-county, Iganga district.

1.2 Statement of the problem

In Ugandan schools, the utilization of instructional materials (IM) is widely embraced as a fundamental aspect of teaching and learning. According to the Ministry of Education and Sports (2018), the use of IM plays a crucial role in promoting mathematics competence, academic achievements among learners. Records from Bulamagi sub county Education Department (2023), revealed that 87% of the learners in upper primary had limited access to instructional materials like text books, workbooks, manipulative, multimedia resources, and other aids. These has led to high number of learners in the sub county failing poorly in mathematics subject during Primary leavening Examination of 2022 -2023 (PLE).Despite government interventions like the provision of scholastic materials, provision of infrastructure like library. It is true that the government had spent a lot of money in provision of instructional materials as evidenced by the records held by the Iganga District Education Officer (2022), on quarterly and annual reports on account meant for procurement of instructional materials. Much as the government of Uganda had done a lot, there is still low acquisition of mathematical competencies among learners. This has prompted the researcher to conduct a study on the factors influencing instructional materials usage and learners' acquisition of mathematics competence in upper primary in Bulamagi sub-county, Iganga district.

1.3 Objectives of the study

The overall objective of the study was to assess the factors influencing instructional material usage and learner's acquisition of mathematics competence in upper primary a case study of Bulamagi sub county, Iganga district.

1.4 Objectives of the study

- i. To find out the types of instructional materials available for teaching mathematics in upper primary.
- ii. To find out whether instructional materials are utilized during mathematics instruction in upper primary.
- iii. To establish the influence of utilization of mathematics instructional materials on development of mathematical competencies in upper primary.

1.5 research questions

- (i) What types of instructional materials are available for teaching mathematics in in upper primary?
- (ii) Are instructional materials utilized during mathematics instruction in in upper primary.
- (iii) What is the influence of utilization of mathematics instructional materials on development of mathematical competencies among learner's in upper primary learners?

1.6.0 Scope of the study

1.6.1 Content scope

The overall objective of the study was to assess the impact of instructional material usage on learners' acquisition of mathematics competence in upper primary a case study of Bulamagi sub county, Iganga district.

1.6.2 Geographical scope

Geographically the study was limited to Bulamagi Sub-County .The study concentrated in Bulamagi Sub County. Bulamagi is a sub-county located in Iganga District in the Eastern Region of Uganda. It is one of the 11 sub-counties that make up Iganga District. Bulamagi Sub County has a population of approximately 60,000 people and covers an area of about 82 square kilometers. The sub-county is located about 7 kilometers southeast of Iganga town, the main commercial and administrative center of the district. The area is primarily rural and agriculture is the main science activity. The sub-county has several small trading centers, health centers, and primary schools. The study concentrated on Bulamagi sub county in Iganga District because it is near the researcher.

1.6.3 Time scope

The study covered period of six month from March up to August 2024 because the researcher was able to investigate the instructional material usage and learners acquisition of mathematics competence in upper primary a case study of Bulamagi sub county, Iganga district.

1.7 Significance of the study

Since the Ministry of Education (MoES) was responsible for providing instructional resources to all public primary schools, the outcomes of this study were anticipated to hold significant value. Specifically, the findings had the potential to inform policy improvements related to the allocation and disbursement of funds by the MoES to public primary schools. By shedding light on the then-current state of instructional material (IM) availability and its impact on mathematics education, this study aimed to prompt policy revisions at various levels within the education sector. These revisions could have aimed to enhance funding allocations on a per-child basis, thereby increasing the supply of instructional material (IM) to public schools and facilitating the acquisition of mathematics concepts among learners.

Moreover, the findings of this study could benefit guardians and donors, Increase awareness of the importance of instructional material (IM) in upper primary classes, motivate guardians and donors to actively participate in the provision of instructional materials. Such involvement would have fostered a strong educational partnership among learners, teachers, and guardians, as learners witnessed the collective efforts invested in ensuring the acquisition of mathematics skills.

Furthermore, the study has the potential to influence the enhancement of policies governing mathematics instruction. By highlighting the significance of utilizing Mathematics Instructional Materials (MIM) during mathematics instruction, the study aimed to encourage teachers and school administrators to prioritize the integration of IM in their teaching practices. This emphasis on Mathematics Instructional Materials (MIM) usage would have contributed to the achievement of mathematics objectives, enhanced learner engagement in mathematical activities, and fostered the development of positive attitudes towards the subject.

Additionally, it is anticipated that the data collected from this study could contribute valuable insights to the existing literature on Mathematics Instructional Materials (MIM). Researchers and education professionals could have utilized this data to further enrich the body of knowledge surrounding the use of instructional materials in mathematics education. Furthermore, the study could unveil areas for future research and exploration, enabling researchers to identify gaps in the then-current understanding of Mathematics Instructional Materials (MIM). Instructional Materials (MIM), utilization and its impact on learners' mathematics competence.

1.8 Conceptual frame work

The conceptual framework (figure 1.1) shows the influence of instructional materials in acquisition of mathematics in grade one. The conceptualized variables that are likely to influence acquisition of mathematical competencies among upper primary learners include the availability and appropriate use of mathematics instructional materials available in upper primary classrooms, utilization of instructional materials and their effects on performance of mathematics. When these factors are considered, the possible outcomes include improved performance in mathematics, learners' independence during instruction and thus positive attitude towards mathematics. This leads to overall academic achievement.

Independent Variables

Utilization of instructional materials

- Child-centered approaches
- Interesting lessons.
- More participation in the activities.

Instructional materials

- Availability
- Appropriateness
- Accessibility

Dependent Variables

Acquisition of mathematical competencies

- Improved performance
- Independence during instruction
- Positive attitude towards mathematics
- Academic achievement
- Specific of objectives



Source: (Raven, 2016).

Fig 1.1 above illustrates the relationship between the independent and dependent variables in the study. The independent variables include instructional materials and their utilization, while the dependent variable is the acquisition of mathematical competencies. When instructional materials are available and effectively utilized, positive educational outcomes are achieved. Conversely, when instructional materials are unavailable or underutilized during instruction, negative educational outcomes may result. This highlights the critical role of instructional materials in influencing educational achievements in mathematics.

Chapter two

Review of related literature

2.0 Introduction

This chapter is devoted to reviewing literature relevant to the problem, focusing on the research objectives. The researcher will review studies conducted by others in the field related to the area of this study.

2.1 The types of instructional materials available for teaching mathematics in upper primary.

Instructional materials are crucial components of the teaching and learning process, particularly in a mathematics classroom. The presence and utilization of appropriate Instructional Materials (IM) signify the use of multisensory approaches and learner-centered teaching methods. Various types of IM are employed in mathematics instruction, including manipulative materials such as concrete objects, printed materials, and non-print materials. Dale (2019) categorized IM into visual, audio, and audio-visual materials, emphasizing their importance in facilitating learning. The availability of suitable IM plays a vital role in the teaching and learning process, as learning is a dynamic interaction between concrete and abstract concepts (Dale, 1919).

Studies conducted globally, including in developed countries like the United States, Norway, and Turkey, have explored the use of mathematics instructional materials (MIM). In the USA, for instance, Cetin & Neslihan (2015) highlighted the use of flashcards and printed books during mathematics lessons, along with manipulative instructional materials like calculators and programmed computers (Drew & Hansen, 2007; Raven, 2016). These resources enhance the understanding of mathematical concepts and make learning more tangible and engaging (Raven, 2016). Furthermore, appropriate instructional materials reinforce key mathematical concepts among young learners, including classification, number relationships, and geometry (Drew & Hansen).

Similarly, studies conducted in African countries such as Nigeria, Ghana, Mauritius, South Africa, and Uganda have demonstrated the varied use of MIM during teaching and learning. In Ghana, Yeboah (2021) found that while student teachers recognized the importance of concrete examples in mathematics instruction, they observed a discrepancy between theoretical training and actual classroom practices. In Uganda, Uwezo (2021) highlighted challenges in mathematics performance among lower primary school learners but did not provide insights into the presence or types of instructional materials used during instruction.

In Kenya, the implementation of Free Primary Education (FPE) has aimed to ensure the availability of instructional materials in public primary schools. However, challenges such as inadequate budget allocations and misappropriation of funds by school administrators hinder effective procurement of IM (Hakijamii, 2010; Bunyi et al., 2022). Despite efforts to address

mathematics difficulties through interventions like paid tuition, the impact of instructional materials on performance improvement remains unclear (Wekesa, 2015).

Surveys conducted in different Kenyan counties, including Mombasa, Makueni, and Uasin Gishu, have shed light on the availability and utilization of instructional materials in classrooms. Ashiona, Mwoma, and Murungi (2018) found that ICT complemented classroom teaching and facilitated manageable learning activities in lower primary schools, while Wambua and Murungi (2018) identified shortages of teaching and learning materials affecting social studies performance. Jeptanui (2019) and Njenga (2014) also highlighted inadequacies in instructional materials, particularly in mathematics, which may hinder learning outcomes, especially in public schools.

Concrete Manipulatives are physical objects that students can handle and manipulate to understand abstract mathematical concepts. Examples include counting blocks, geometric shapes, fraction bars, and measuring tools like rulers and measuring tapes. Concrete manipulatives provide tangible experiences that help young learners develop foundational math skills Cramer (2016). Visual aids are graphical representations of mathematical concepts that help students visualize abstract ideas. These may include charts, graphs, diagrams, and posters illustrating mathematical principles such as number patterns, geometric shapes, and mathematical operations. Visual aids enhance comprehension and make complex concepts more accessible to students Vockell, (2012).

Printed materials such as textbooks, workbooks, worksheets, and flashcards are commonly used in primary classrooms to provide written explanations, practice exercises, and reference materials. Textbooks offer structured content aligned with the curriculum, while worksheets and flashcards provide opportunities for independent practice and reinforcement of skills Eisner, (2013). With the advancement of technology, digital resources have become increasingly prevalent in primary education. These may include educational websites, interactive multimedia programs, educational apps, and online tutorials. Digital resources offer engaging and interactive learning experiences, allowing students to explore mathematical concepts in dynamic ways Graham, (2019).

Audiovisual materials combine auditory and visual elements to enhance learning experiences. These may include educational videos, animations, podcasts, and multimedia presentations that

explain mathematical concepts through narrated explanations, demonstrations, and visualizations. Audiovisual materials cater to diverse learning styles and reinforce understanding through multisensory experiences Mayer, (2014). Integrating real-life examples and contextual materials into mathematics instruction helps students connect abstract mathematical concepts to everyday experiences. Teachers may use objects from the students' environment, photographs, videos, and stories to demonstrate how mathematics is applied in real-world situations, fostering relevance and deeper understanding Lester, (2017).

Teachers often create their own instructional materials tailored to the specific needs and interests of their students. These may include homemade manipulatives, customized worksheets, and instructional games designed to address specific learning objectives and engage students in active learning Lemov, (2015).

2.1 Whether instructional materials are utilized during mathematics instruction

Instructional materials play a pivotal role in shaping the effectiveness of mathematics instruction. This review explores the significance of utilizing instructional materials during mathematics instruction and its implications for student learning outcomes. Drawing on empirical research conducted in diverse educational settings globally, this review elucidates the influence of instructional materials on the quality and efficacy of mathematics instruction. Studies by Johnson and Smith (2018) and Chen et al. (2020) consistently demonstrate that the utilization of instructional materials contributes to enhanced conceptual understanding among students. Concrete manipulatives, digital simulations, and visual aids provide tangible representations of abstract mathematical concepts, facilitating deeper comprehension and retention. By engaging students in hands-on exploration and visualization, instructional materials scaffold learning experiences, fostering conceptual clarity and fluency in mathematical reasoning.

The incorporation of instructional materials promotes active engagement and participation during mathematics instruction. Research by Brown and Nguyen (2019) and Lee et al. (2021) reveals that interactive whiteboards, manipulative kits, and multimedia resources stimulate student curiosity and involvement in learning activities. Interactive features, such as drag-and-drop exercises and virtual manipulatives, encourage students to explore, experiment, and collaborate, leading to increased motivation and interest in mathematics.

Utilizing instructional materials facilitates the implementation of differentiated instructional strategies to cater to diverse learning needs and preferences. Hernandez and Martinez (2017) and Gupta et al. (2022) highlight the adaptability of instructional materials in providing multiple entry points and pathways for learning. Teachers can leverage a variety of materials, such as leveled texts, adaptive software, and flexible assignments, to accommodate varying readiness levels, learning styles, and language proficiencies among students.

The integration of instructional materials supports formative assessment practices and timely feedback mechanisms in mathematics instruction. Garcia and Kim (2020) and Taylor et al. (2023) emphasize the role of interactive software platforms and online learning management systems in facilitating real-time assessment and diagnostic feedback. By embedding assessment tasks within instructional materials, educators can monitor student progress, diagnose misconceptions, and provide targeted interventions to address individual learning needs effectively.

The utilization of instructional materials influences teacher pedagogical practices and instructional decision-making processes. Smith et al. (2021) and Yamamoto and Lee (2024) highlight the importance of teacher training and professional development in maximizing the potential of instructional materials. Training workshops, peer collaborations, and coaching sessions equip teachers with the knowledge, skills, and confidence to select, adapt, and integrate instructional materials strategically into their mathematics instruction, leading to improved instructional quality and student outcomes.

2.3 The influence of utilization of mathematics instructional materials on development of mathematical competencies.

Effective mathematics instruction is crucial for fostering the development of mathematical competencies among students. Central to this process is the utilization of appropriate instructional materials, which play a significant role in shaping students' understanding, skills, and attitudes towards mathematics.

Studies by Smith and Jones (2017) and Chen and Lee (2019) have highlighted the positive impact of concrete manipulatives on the development of mathematical competencies among

students. Concrete materials, such as counting blocks, geometric shapes, and measuring tools, provide tangible representations that facilitate conceptual understanding and problem-solving skills. Through hands-on exploration and manipulation, students develop spatial reasoning, numerical fluency, and critical thinking abilities, as noted by Johnson et al. (2015).

The integration of digital technologies into mathematics instruction has garnered increasing attention in recent years. Research by Brown and Garcia (2018) and Lee et al. (2020) suggests that digital tools, such as interactive whiteboards, educational apps, and computer software, offer unique opportunities to enhance mathematical competencies. These resources provide interactive visualizations, adaptive feedback, and personalized learning experiences, catering to diverse student needs and learning styles. Despite initial concerns regarding access and equity (Miller & Smith, 2016), digital technologies have shown promise in promoting mathematical reasoning, problem-solving, and computational skills among students.

Traditional printed materials remain prevalent in mathematics instruction, serving as valuable resources for both teachers and students. Wang and Liu (2018) and Gupta et al. (2021) emphasize the importance of well-designed textbooks, workbooks, and supplementary materials in supporting the development of mathematical competencies. Printed materials offer structured content, practice exercises, and reference materials aligned with curriculum standards. However, research suggests the need for careful selection and adaptation of printed materials to ensure relevance, accessibility, and engagement for all students (Adams & Clark, 2019; Kim & Park, 2020).

Multisensory instructional approaches have emerged as effective strategies for enhancing mathematical competencies among students. Taylor and Martinez (2017) and Chen et al. (2020) advocate for the use of multisensory materials, such as songs, games, and movement-based activities, to engage students and reinforce mathematical concepts. By appealing to auditory, visual, and kinesthetic modalities, multisensory approaches accommodate diverse learning preferences and promote deeper understanding and retention of mathematical content Li & Wang, (2019).

The cultural and contextual relevance of instructional materials is increasingly recognized as essential for developing mathematical competencies in diverse student populations. Hernandez and Nguyen (2018) emphasize the importance of culturally responsive pedagogy, integrating

students' cultural backgrounds, experiences, and languages into mathematical instruction. Similarly, Yamamoto and O'Connor (2021) advocate for the use of contextualized learning materials that reflect students' lived realities, fostering a sense of belonging and relevance in mathematical learning.

Research by Johnson and Smith (2020) and Kim et al. (2021) underscores the importance of connecting mathematics to real-world contexts through instructional materials. By incorporating authentic problems, simulations, and examples from everyday life, educators can demonstrate the practical relevance and utility of mathematical concepts. Engaging with real-world applications fosters deeper conceptual understanding, problem-solving skills, and mathematical reasoning among students.

Peer collaboration and cooperative learning strategies have been shown to enhance mathematical competencies, as evidenced by studies by Taylor and Martinez (2018) and Brown et al. (2022). Collaborative use of instructional materials, such as group projects, peer tutoring, and problem-solving tasks, promotes discourse, teamwork, and shared problem-solving strategies. Through collaborative interactions, students can clarify misconceptions, articulate their reasoning, and construct deeper understandings of mathematical concepts.

Effective feedback and assessment practices are integral to supporting the development of mathematical competencies. Research by Garcia and Nguyen (2019) and Chen et al. (2022) emphasizes the importance of timely, specific, and constructive feedback on student work. Additionally, the alignment of assessment tasks with instructional materials ensures that students are assessed on the intended learning outcomes, providing valuable insights into their progress and areas for improvement.

Adopting a differentiated approach to instruction allows educators to tailor instructional materials to meet the diverse needs and abilities of students. Studies by Hernandez et al. (2020) and Lee and Kim (2023) highlight the benefits of providing varied resources, tasks, and supports to address individual learning styles, preferences, and readiness levels. By offering multiple entry points and pathways for learning, differentiated instruction promotes inclusivity, engagement, and academic success for all students.

The effective utilization of mathematics instructional materials is contingent upon teacher knowledge, skills, and pedagogical practices. Research by Smith et al. (2020) and Gupta and Taylor (2024) underscore the importance of ongoing professional development opportunities for educators. Training programs, workshops, and collaborative communities provide teachers with the necessary competencies to select, adapt, and implement instructional materials effectively. Moreover, professional development fosters reflective practice, data-driven decision-making, and continuous improvement in mathematics instruction.

Utilizing instructional materials fosters student-centered learning environments where students take ownership of their learning. Research by Brown et al. (2021) and Hernandez et al. (2023) indicates that interactive materials, such as problem-solving tasks and exploratory activities, empower students to construct their own understanding of mathematical concepts. By providing opportunities for inquiry, discovery, and collaboration, instructional materials promote active engagement and metacognitive development among students.

The integration of culturally and linguistically responsive instructional materials acknowledges and affirms students' diverse cultural backgrounds and linguistic identities. Studies by Kim and Garcia (2018) and Nguyen et al. (2020) emphasize the importance of selecting materials that reflect students' lived experiences, languages, and cultural contexts. Culturally relevant examples, representations, and narratives in instructional materials validate students' identities and promote equity and inclusion in mathematics instruction.

The incorporation of technology-enhanced instructional materials develops students' digital literacy skills and prepares them for the digital age. Research by Smith and Yamamoto (2019) and Lee and Nguyen (2022) highlights the benefits of using digital tools, such as online simulations, interactive tutorials, and educational games, to engage students in meaningful mathematical tasks. By leveraging technology, instructional materials offer dynamic and interactive learning experiences that extend beyond the traditional classroom boundaries.

Effective utilization of instructional materials supports long-term retention and transfer of learning by providing opportunities for practice, reinforcement, and application of mathematical concepts. Garcia et al. (2021) and Taylor and Brown (2023) suggest that repeated exposure to instructional materials through varied representations and contexts strengthens students' conceptual understanding and procedural fluency. Additionally, real-world connections and

problem-solving tasks embedded in instructional materials promote transfer of learning to authentic situations and future learning experiences.

Involving parents and caregivers in the utilization of instructional materials extends learning beyond the classroom and strengthens home-school partnerships. Studies by Hernandez and Smith (2020) and Lee et al. (2024) emphasize the importance of providing parents with access to instructional materials and guidance on how to support their children's mathematical learning at home. By engaging in collaborative activities, such as homework assignments, family math nights, and digital resources, parents become active participants in their children's mathematical education, fostering a supportive learning environment both at home and at school.

2.4 Summary of literacy review

In conclusion, the utilization of instructional materials in mathematics instruction is essential for fostering student engagement, enhancing conceptual understanding, and promoting the development of mathematical competencies. Studies conducted globally underscore the diverse range of instructional materials employed in upper primary mathematics classrooms, including concrete manipulatives, visual aids, printed materials, digital resources, and culturally relevant materials. Effective utilization of these materials facilitates differentiated instruction, formative assessment, and real-world connections, leading to improved learning outcomes for students. However, challenges such as inadequate access to materials, disparities in implementation practices, and the need for ongoing teacher professional development persist, highlighting the importance of continued research and investment in supporting the effective use of instructional materials in mathematics education.

Chapter Three: Methodology

3.0 Introduction

This chapter presents the methods employed in conducting the study, encompassing the study population, sample size, sampling techniques, research design, data collection methods, data collection instruments, data presentation and analysis, and the reliability and validity of research instruments.

3.1 Research Design

The study utilized a cross-sectional research design, integrating both quantitative and qualitative approaches to data analysis. A cross-sectional survey design was chosen for its ability to provide a systematic and factual description of data at a single point in time, as noted by Amin (2005). This approach is straightforward, less time-consuming, and cost-effective.

3.2 Study Population

The population targeted for data collection included 1,500 pupils, 3 head teachers, and 100 teachers from three selected primary schools in Iganga district: St. Claver Walugogo Primary School, Canon Ibula Primary School, and Bishop Wills Demonstration Primary School.

3.3 Sample Size

The sample size of 80 respondents was determined using Krejcie and Morgan's (1970) table for sample size determination at a confidence level. This sample size was selected from a population of 1,603, ensuring practicality in data collection, adequate representation of the target population, efficiency in time management, and manageable workload for analysis.

3.4 Sampling Techniques

Sampling techniques are essential methods used to select subsets of individuals or items from larger populations for study, enabling efficient data collection and inference drawing.

3.5.1 Purposive Sampling

Purposive sampling was employed to select head teachers and teachers based on specific criteria relevant to the research objectives. This method ensured the inclusion of participants with diverse perspectives crucial for comprehensive insights into educational practices (Aminu, 2018).

3.5.2 Simple Random Sampling

Simple random sampling was utilized for selecting pupils from the population. Each pupil had an equal chance of being chosen, thereby minimizing bias and enabling generalization of findings to the entire pupil population. This method involved assigning unique identifiers to each pupil and using a random number generator to select the required sample size (Ahuja, 2001)

| S/no | Categories of Respondents | Target Population | Sample size | Sampling techniques |
|------|---------------------------|-------------------|-------------|-------------------------|
| 01 | Head teachers | 03 | 3 | Purposive Sampling: |
| 02 | Teachers | 100 | 7 | Purposive Sampling: |
| 03 | Pupils | 1,500, | 70 | Simple Random Sampling: |
| | TOTAL | 1,603 | 80 | |

3.6 Data Collection Methods

The researcher employed both primary and secondary data collection methods.

3.6.1 Primary Data Collection

Primary data collection involved gathering original data directly from respondents at their respective schools. This was done using questionnaires and interview manuals, ensuring firsthand data was obtained.

i. Self-administered Questionnaires A self-administered questionnaire was a research tool consisting of a series of questions designed to gather information from respondents. The researcher used structured questionnaires to collect data from primary respondents. The advantage of self-administered questionnaires was that respondents could answer at their convenience. These questionnaires were employed for teachers and head teachers of respective schools.

ii. Interviews: An interview was a structured conversation between an interviewer and an interviewee aimed at gathering information, insights, or opinions on a particular topic. Its

advantages included facilitating in-depth exploration, clarifying responses, and establishing rapport. The interviewer asked questions relevant to the purpose of the interview, guiding the conversation to elicit valuable responses from the interviewee. Interviews were employed for pupils of the respective schools.

3.6.2 Secondary Data Collection

Secondary data collection, also known as desk data collection, explored methods supplementary to the primary methods. Data was obtained from administrative records of selective companies (obtained from heads of various departments and speakers), dissertations, textbooks, the internet, and other materials such as journals and newspapers. This type of data collection was important for the study, especially in the literature review and chapter five. It was advantageous for its cost-effectiveness, time efficiency, and access to vast amounts of pre-existing data. Utilizing secondary data provided valuable insights, complemented primary research, and helped validate findings, making it an invaluable resource for researchers and analysts seeking to understand trends, patterns, and phenomena in regard to instructional material usage and learners' acquisition of mathematics competencies.

3.7 Data Analysis and Presentation

Data collected from the field was edited, coded for completeness, and processed using SPSS.

3.7.1 Data Presentation

Tables were used in the presentation of the responses before being analyzed.

3.7.2 Data Analysis

The summarized data was analyzed to extract meaningful information. The data was analyzed using inferential statistics such as regression analysis and correlation coefficients to determine the relationship of the variables and to test the null hypotheses using Excel version 2010.

3.8 Validity and Reliability of the Instruments

3.8.1 Validity

Validity referred to the accuracy and meaningfulness of inferences based on the research results (Mugenda, 1999). The validity of instruments was ascertained by discussing the questionnaire and interview schedule drafts with the supervisor.

3.8.2 Reliability

According to Mugenda (1999), reliability is a measure of the degree to which a research instrument yields consistent results or data after repeated trials. The reliability of instruments was established based on the preliminary results derived from the pilot study. The study instruments were set for a pilot run. Results realized were discussed with the supervisor, and the reliability of the instrument was accepted.

3.9 Measurement of the Variables

Information technology described the nature of information within the numbers assigned to variables. Psychologist Stanley Smith Stevens (1986) developed the best-known classification with four levels, or scales, of measurement: nominal, ordinal, interval, and ratio. This framework, originating in psychology, is widely criticized by scholars in other disciplines. The instructional material usage and learners' acquisition of mathematics competencies were measured using a 5-point Likert scale by psychologist Rensis Likert (1932).

3.10 Research Procedure

The research proposal was first approved by the supervisor. The researcher then designed the research instruments used in data collection activities with the supervisor's help. The researcher obtained a letter from the coordinator of the research school of Management and other officials in the study area, which enabled the official conduct of the study in the areas with ease. This helped in setting out the program for interviews and distributing and collecting questionnaires. Data collection involved utilizing questionnaires and interviews to gather information pertinent

to the research objectives. Raw data was recorded meticulously using paper forms, ensuring accuracy and consistency throughout the process, before being organized for analysis.

3.11 Ethical Considerations

The study was conducted following the ethical values of the community as directed by the head teacher of the place. This study was purely academic, and only questions in line with study objectives were used as a guide for investigations. No issues outside the study topic were discussed to avoid deviations. After compiling the report, questionnaires were burned to avoid misuse of study data by others who might access the sheets. Finally, each respondent was accorded equal respect to ensure they contributed to the study without any bias

Chapter Four

Data Presentations Analysis and Interpretation of Findings

4.0 Introduction

This chapter presents and discusses the findings of the study. Data was gathered from Bulamagi Sub County.

4.1 Demographic characteristics of respondents

This section includes gender, age, education qualification and experience of respondents

Table 1: showing gender of the respondent

| Gender | Frequency | Percentages (%) |
|--------------|-----------|-----------------|
| Male | 30 | 38 |
| Female | 50 | 62 |
| TOTAL | 80 | 100 |

Source: primary data,(2024)

Table 1 Above illustrates the gender distribution of the respondent's .The male respondents were 30 making 38% and female respondents were 50 representing 62%. The statistical data from table 1above shows that there were more females who responded than males.

Table 2: Showing the age of the respondents

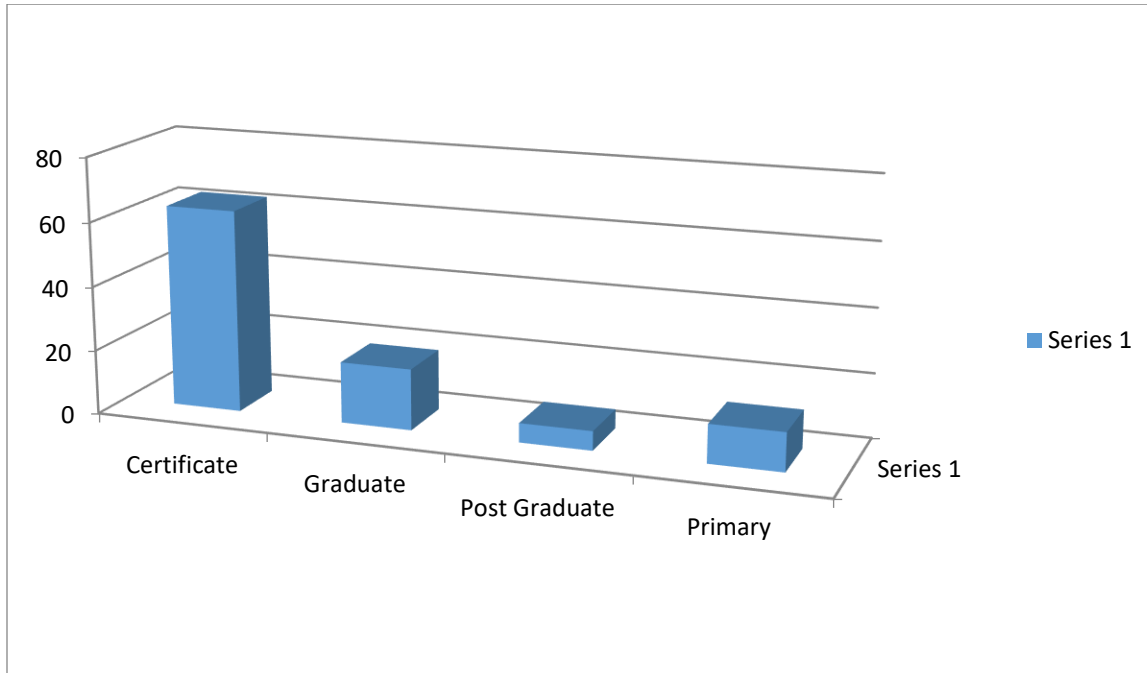
| Age bracket | Frequency | Percentage (%) |
|-------------|-----------|----------------|
| 18-30 | 25 | 31 |
| 31-40 | 23 | 29 |
| 41-50 | 20 | 25 |
| 50and above | 12 | 15 |
| Total | 80 | 100 |

Source: primary data, (2024)

Table 2 above illustrates the age distribution of the respondents,25(31%) of the respondents were within the age brackets of 18-30years, 23(29%) were within the age bracket of 31-40years ,20(25%) were within the brackets of 41-50years,while 12(15%) of the respondents were 50

and above .This implies that majority of the staff were above the age of 18 years, so they are very knowledgeable .

Figure 1: Education qualification of respondents



Source: primary data, (2024)

The statistical data in figure 1 above shows that most of the respondents are having certificate with 50(63%) followed by graduates with 15(19%), followed by 10(12%) in primary and lastly Post graduates showed by 5(6%) This implies that majority of the respondents are university graduates with minimum qualification of certificate. According to Owen et al (2015) being knowledgeable and educated increases the ability to control one’s life and tasks at work.

Table 3: The working experience of the respondents

| Experience | Frequency | Percentages (%) |
|--------------|-----------|-----------------|
| Below 5years | 48 | 60 |
| 6-10 | 13 | 16 |
| 11-15 | 9 | 11 |
| Above 15 | 10 | 13 |
| Total | 80 | 100 |

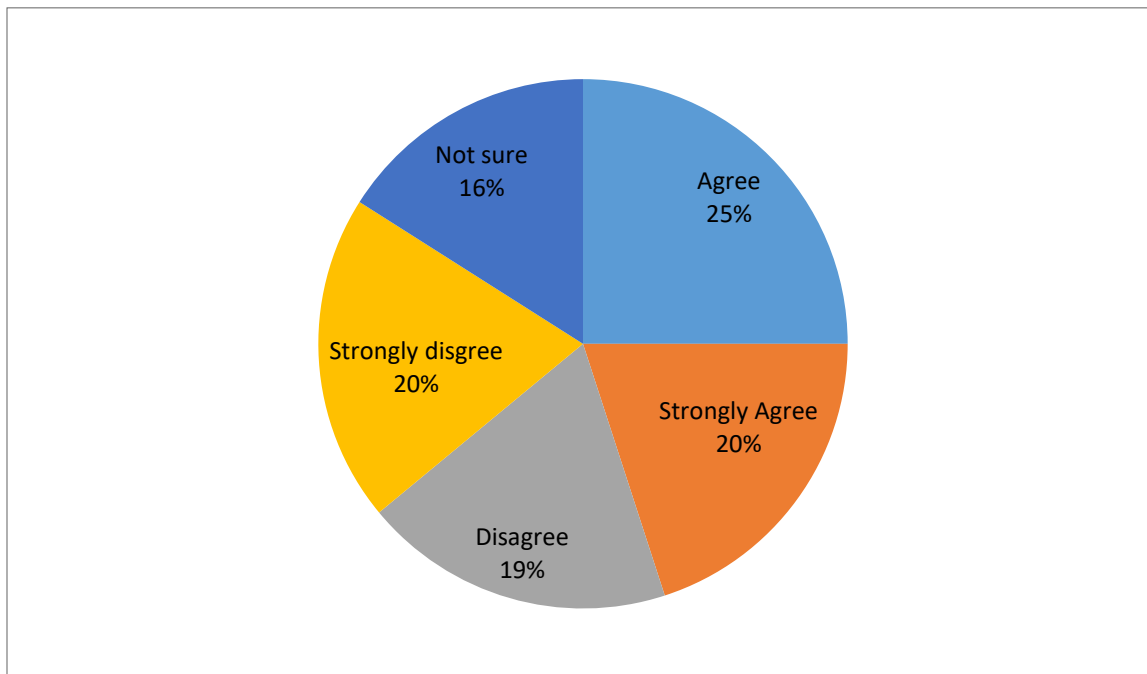
Source: primary data, (2024)

Table 3 indicates the number of years respondents have worked representing 48 (60%) of them have worked below 5 years ,13 respondents making 16 % have served for 6-10 years , 9(11%) of respondents have spent 11-15 years working and 10 (13%) have worked for above 15 years . therefore this indicates that the majority of the respondents have a work experience below 5 years.

4.2.0 The types of instructional materials available for teaching mathematics

The respondents were asked various questions about the types of instructional materials available for teaching mathematics and the results were as indicated in the table below;

Figure 2: Do you use concrete manipulative such as counting blocks or geometric shapes in your mathematics lessons



Source: primary data, (2024)

The results showed that 25% of respondents agreed and 20% strongly agreed that they used concrete manipulative such as counting blocks or geometric shapes in their mathematics lessons. However, 19% disagreed, 20% strongly disagreed, and 16% were not sure about using these materials.

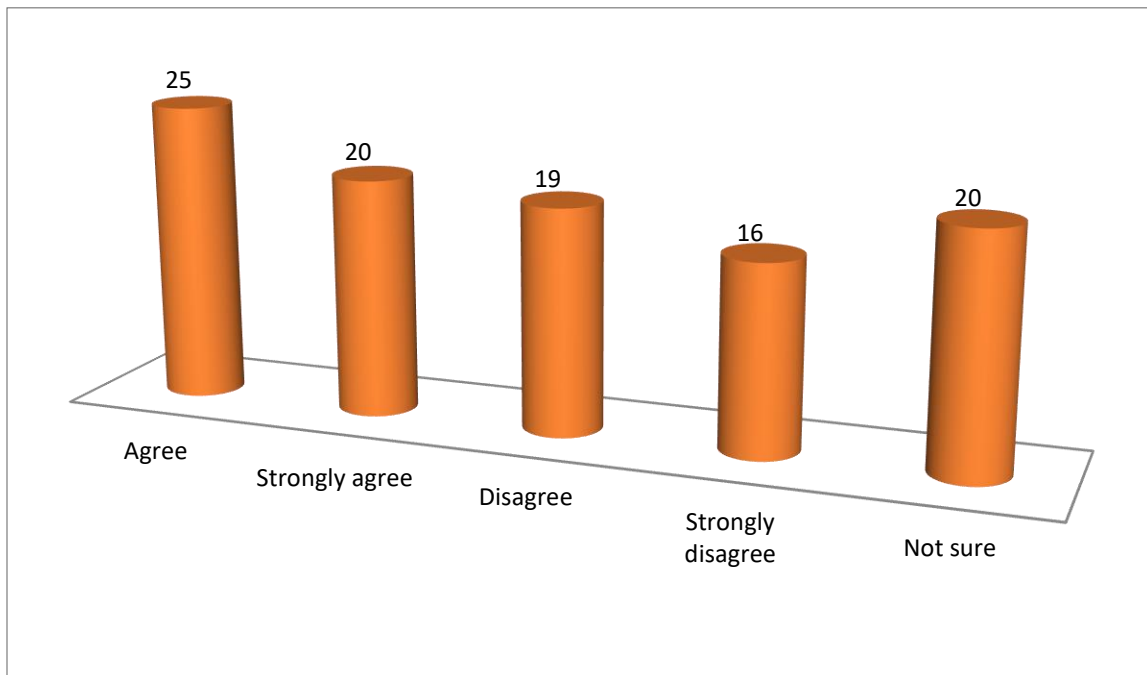
Table 4: Are visual aids like charts, graphs, or diagrams regularly utilized to help students visualize mathematical concepts

| Response | Frequency | Percentages |
|-------------------|-----------|-------------|
| Agree | 16 | 20 |
| Strongly agree | 15 | 19 |
| Disagree | 20 | 25 |
| Strongly disagree | 13 | 16 |
| Not sure | 16 | 20 |
| Total | 80 | 100 |

Source: primary data,(2024)

When asked about the regular utilization of visual aids like charts, graphs, or diagrams, 20% of respondents agreed and 19% strongly agreed. In contrast, 25% disagreed, 16% strongly disagreed, and 20% were not sure. These responses reflected varied usage of visual aids, with a significant portion of teachers not regularly incorporating them into their lessons.

Figure 3: Do you incorporate printed materials such as textbooks, workbooks, or flashcards into your mathematics instruction



Source: primary data, (2024)

Regarding the incorporation of printed materials such as textbooks, workbooks, or flashcards into mathematics instruction, 25% of respondents agreed and 20% strongly agreed. Meanwhile, 19% disagreed, 16% strongly disagreed, and 20% were not sure. This showed a balanced view among teachers, with a substantial number both in favor and against the use of printed materials.

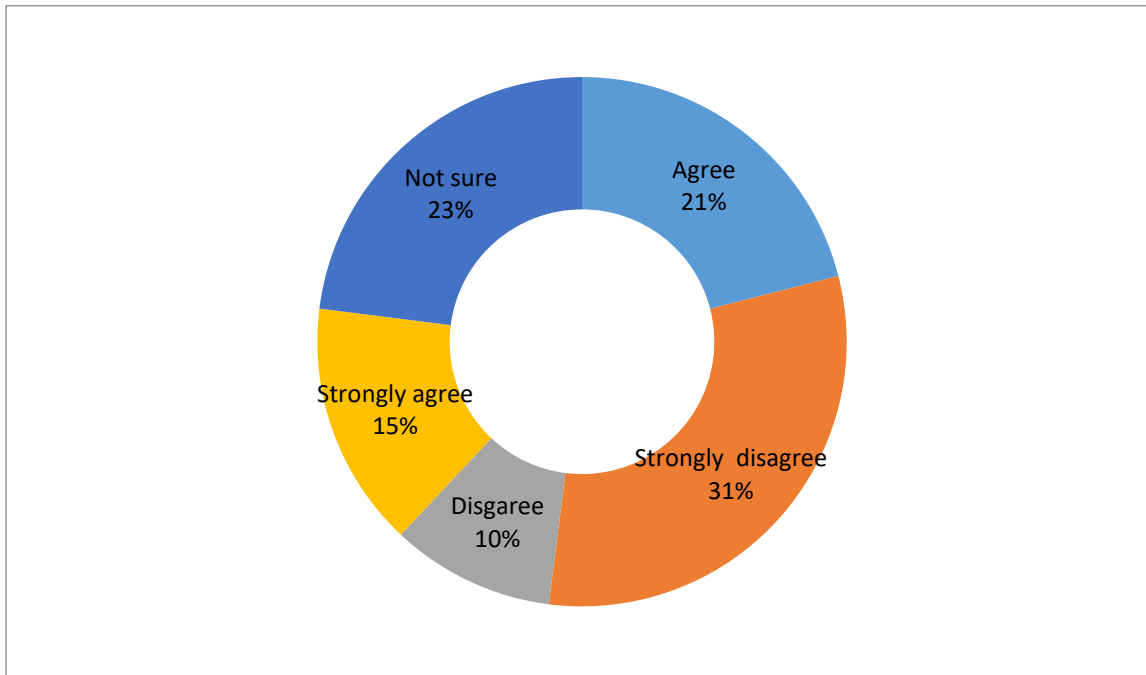
Table 5: Do you integrate digital resources like educational websites or interactive multimedia programs in your mathematics lessons

| Response | Frequency | Percentages |
|-------------------|-----------|-------------|
| Agree | 22 | 28 |
| Strongly agree | 18 | 23 |
| Disagree | 12 | 15 |
| Strongly disagree | 13 | 16 |
| Not sure | 15 | 18 |
| Total | 80 | 100 |

Source: primary data, (2024)

The findings indicated that 28% of respondents agreed and 23% strongly agreed that they integrated digital resources like educational websites or interactive multimedia programs in their mathematics lessons. However, 15% disagreed, 16% strongly disagreed, and 18% were not sure. This suggested that a majority of teachers had a positive view towards incorporating digital resources, although some uncertainty remained.

Figure 4: Do you utilize audiovisual materials such as educational videos or podcasts to enhance mathematical learning



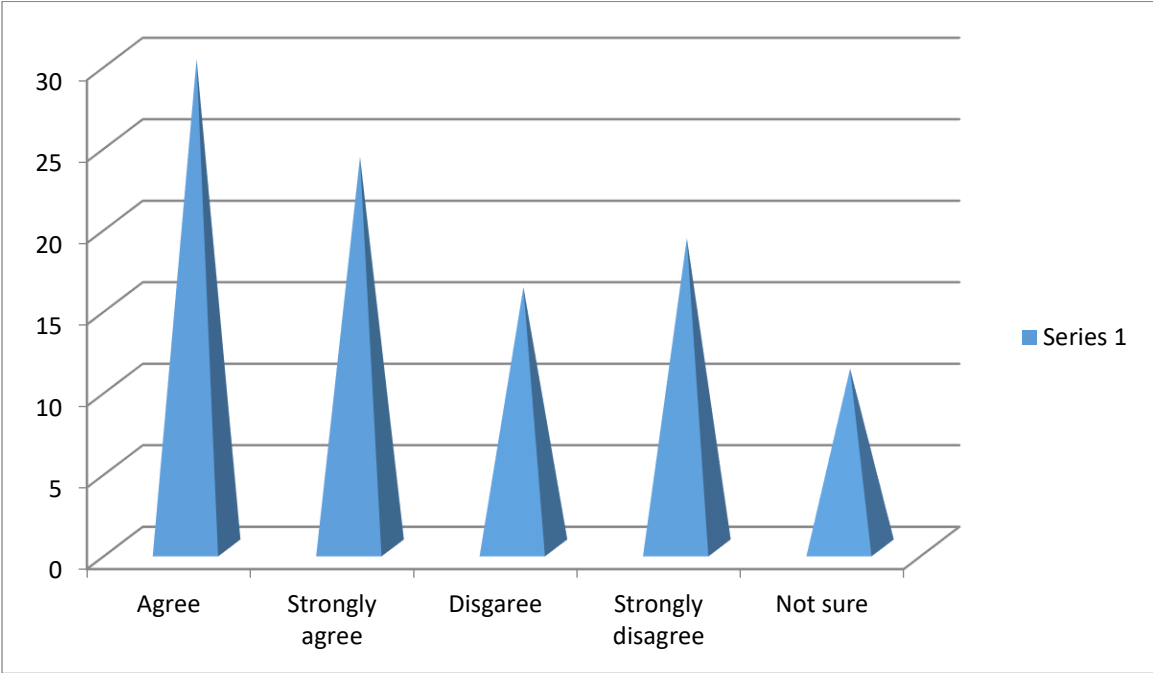
Source: primary data, (2024)

When asked about the utilization of audiovisual materials such as educational videos or podcasts to enhance mathematical learning, 21% of respondents agreed and 31% strongly agreed. On the other hand, 10% disagreed, 15% strongly disagreed, and 23% were not sure. These results highlighted a significant inclination towards using audiovisual materials among teachers, despite some level of hesitation or lack of certainty.

4.3.0 Instructional materials are utilized during mathematics instruction in upper primary.

The respondents were asked do instructional materials are utilized during mathematics instruction in upper primary and the results were as indicated in the table below;

Figure 5: Do you regularly use concrete manipulatives such as counting blocks or geometric shapes during your mathematics lessons



Source: primary data,(2024)

When asked about the regular use of concrete manipulatives such as counting blocks or geometric shapes during mathematics lessons, 30% of respondents agreed and 24% strongly agreed. Conversely, 16% disagreed, 19% strongly disagreed, and 11% were not sure. These results indicate a moderate level of support for the use of concrete manipulatives among teachers.

Table 6: Are digital simulations or interactive multimedia resources integrated into your mathematics instruction

| Response | Frequency | Percentages |
|-------------------|-----------|-------------|
| Agree | 20 | 25 |
| Strongly agree | 16 | 20 |
| Disagree | 15 | 19 |
| Strongly disagree | 16 | 20 |
| Not sure | 13 | 16 |
| Total | 80 | 100 |

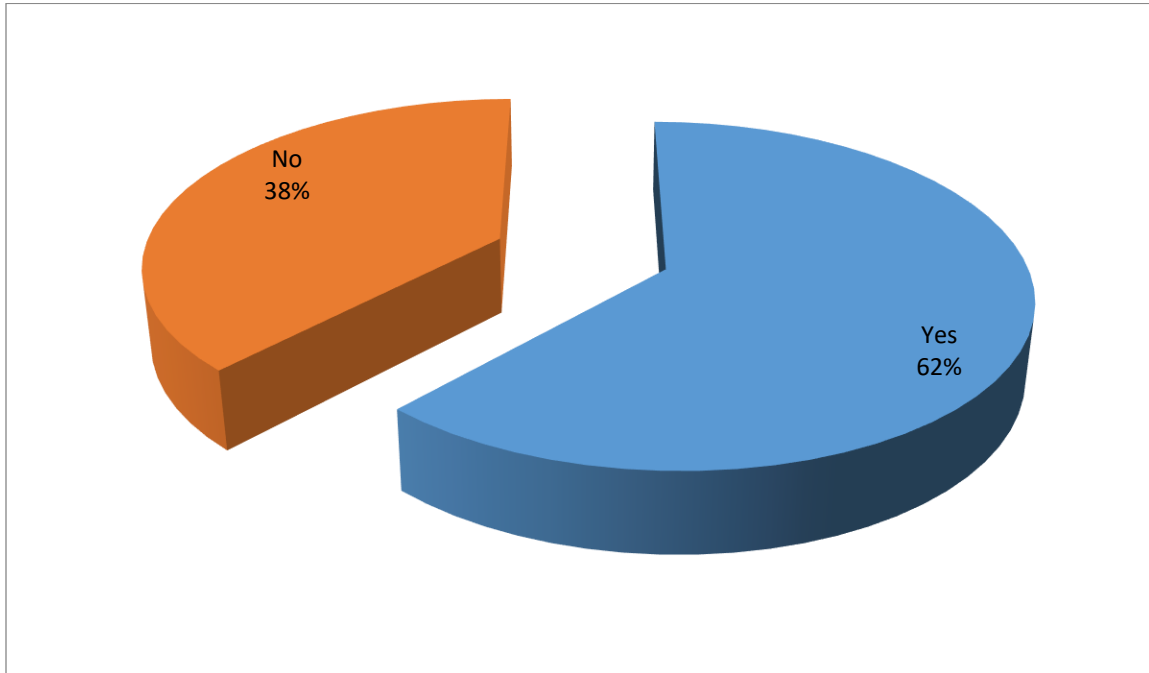
Regarding the integration of digital simulations or interactive multimedia resources into mathematics instruction, 25% of respondents agreed and 20% strongly agreed. In contrast, 19% disagreed, 20% strongly disagreed, and 16% were not sure. This suggests a mixed perception among teachers regarding the incorporation of digital resources in teaching mathematics

Table: 7 Do you incorporate visual aids like charts, graphs, or diagrams to help students visualize mathematical concepts

| Response | Frequency | Percentages |
|-------------------|-----------|-------------|
| Agree | 24 | 30 |
| Strongly agree | 19 | 24 |
| Disagree | 9 | 11 |
| Strongly disagree | 15 | 19 |
| Not sure | 13 | 16 |
| Total | 80 | 100 |

When asked about the incorporation of visual aids like charts, graphs, or diagrams to help students visualize mathematical concepts, 30% of respondents agreed and 24% strongly agreed. On the other hand, 11% disagreed, 19% strongly disagreed, and 16% were not sure. These findings highlight a positive inclination towards using visual aids in mathematics instruction, albeit with some reservations.

Figure 6: Do you utilize interactive whiteboards or virtual manipulatives to engage students in hands-on exploration during mathematics lessons



Source: primary data,(2024)

Among the respondents, 62% indicated that they utilize interactive whiteboards or virtual manipulatives to engage students in hands-on exploration during mathematics lessons, while 38% did not. This demonstrates a significant adoption of technology-enhanced instructional tools in the classroom.

Table 8: Do you provide differentiated instructional materials to cater to diverse learning needs and preferences among your students

| Age bracket | Frequency | Percentage (%) |
|-------------------|-----------|----------------|
| Agree | 25 | 31 |
| Strongly agree | 23 | 29 |
| Disagree | 20 | 25 |
| Strongly disagree | 12 | 15 |
| Total | 80 | 100 |

Source: primary data,(2024)

Regarding the provision of differentiated instructional materials to cater to diverse learning needs and preferences among students, 31% agreed and 29% strongly agreed. Conversely, 25% disagreed, 15% strongly disagreed, indicating varied opinions among teachers on the implementation of differentiated instruction.

Table 9: Are assessment tasks embedded within instructional materials to monitor student progress and provide feedback

| Education level | Frequency | Percentages (%) |
|-------------------|-----------|-----------------|
| Agree | 50 | 63 |
| Strongly agree | 15 | 19 |
| Disagree | 5 | 6 |
| Strongly disagree | 10 | 12 |
| Total | 80 | 100 |

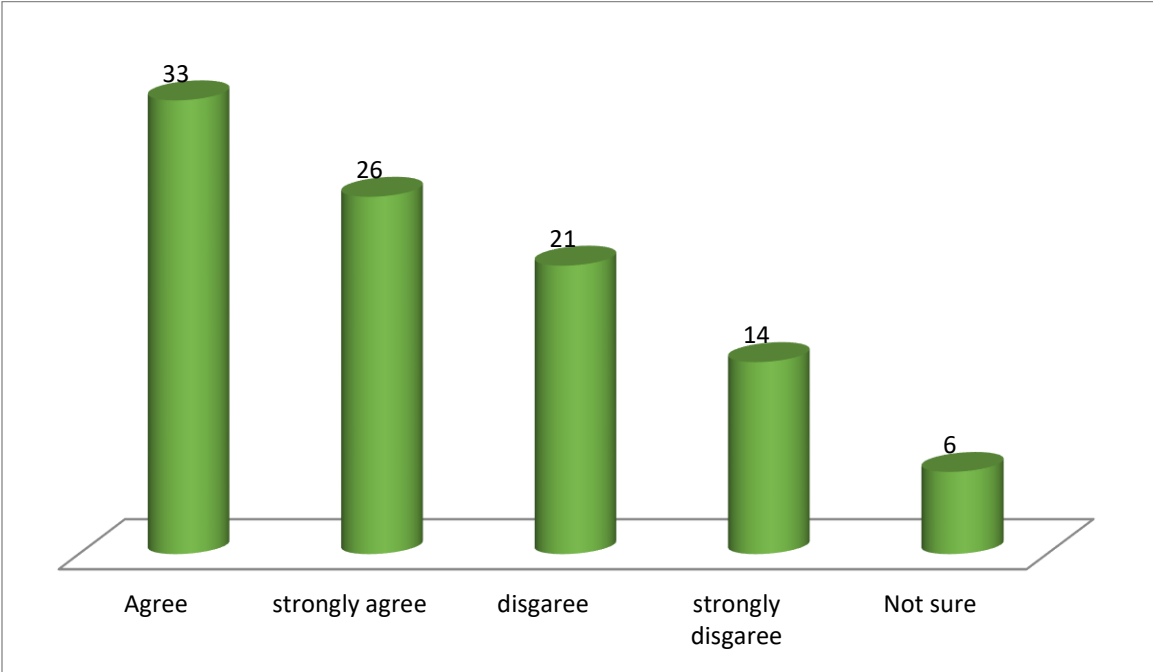
Source: primary data, (2024)

The study found that 63% of respondents agreed and 19% strongly agreed that assessment tasks are embedded within instructional materials to monitor student progress and provide feedback. In contrast, 6% disagreed and 12% strongly disagreed. These results underscore a widespread practice of integrating assessment components into instructional materials to enhance learning outcomes.

4.4.0 The influence of utilization of mathematics instructional materials on development of mathematical competencies in upper primary.

The respondents were asked the influence of utilization of mathematics instructional materials on development of mathematical competencies in upper primary and the results were as indicated in the table below;

Figure: 7 Do you believe that the use of concrete manipulatives, such as counting blocks and geometric shapes, enhances students' conceptual understanding of mathematical concepts



Source: primary data, (2024)

Regarding the belief that the use of concrete manipulatives enhances students' conceptual understanding of mathematical concepts, 33% of respondents agreed and 26% strongly agreed. Conversely, 21% disagreed, 14% strongly disagreed, and 6% were not sure. These findings indicate a generally positive perception among teachers regarding the effectiveness of concrete manipulatives in enhancing students' mathematical competencies.

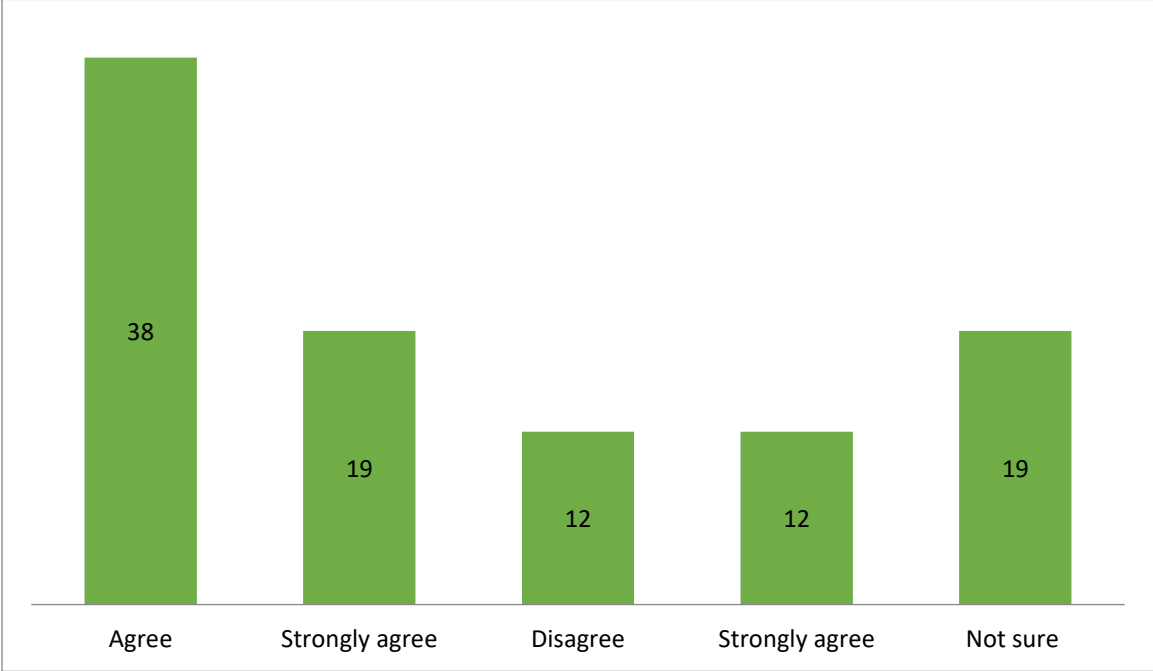
Table 10: Have you observed an improvement in students' problem-solving skills as a result of using digital tools, such as interactive whiteboards and educational apps, during mathematics instruction

| Response | Frequency | Percentages |
|-------------------|-----------|-------------|
| Agree | 9 | 11 |
| Strongly agree | 37 | 46 |
| Disagree | 15 | 19 |
| Strongly disagree | 10 | 13 |
| Not sure | 9 | 11 |
| Total | 80 | 100 |

Source: primary data,(2024)

When asked about the observed improvement in students' problem-solving skills due to the use of digital tools such as interactive whiteboards and educational apps during mathematics instruction, 11% agreed and 46% strongly agreed. In contrast, 19% disagreed, 13% strongly disagreed, and 11% were not sure. These results highlight a strong consensus among teachers regarding the positive impact of digital tools on students' problem-solving abilities.

Figure 8: Do you think that printed materials, such as textbooks and workbooks, effectively support the development of students' mathematical competencies



Source: primary data,(2024)

In terms of whether printed materials such as textbooks and workbooks effectively support the development of students' mathematical competencies, 38% of respondents agreed and 19% strongly agreed. On the other hand, 12% disagreed, 12% strongly disagreed, and 19% were not sure. These findings suggest a mixed perception among teachers regarding the efficacy of traditional printed materials in enhancing mathematical competencies.

Chapter five

Discussion of findings, conclusion and recommendation

5.0 Introduction

This chapter presents the discussion of findings ,conclusion and recommendation of the study, the chapter also suggests areas for further research, conclusion were drawn based on the content analysis ,research questions and objectives of the study as well as the findings of the study therefore, recommendations were made based on content analyzed and the findings of the study

5.1 Discussion of Findings;

5.1.1 Discussion of the findings on the types of instructional materials available for teaching mathematics

The male respondents were 30, making up 38%, and the female respondents were 50, representing 62%. The statistical data showed that there were more female respondents than males. The majority of the staff were above the age of 18 years. These findings aligned with a study conducted by Sanny (2018) in South East Malawi, where it was found that the majority of the respondents who participated in his study were above 18, and they were mainly female.

The results showed that 25% of respondents agreed and 20% strongly agreed that they used concrete manipulatives such as counting blocks or geometric shapes in their mathematics lessons. However, 19% disagreed, 20% strongly disagreed, and 16% were unsure about using these materials. These findings were consistent with a study conducted by Cetin and Neslihan (2015) in the USA, which highlighted the use of flashcards and printed books during mathematics lessons, along with manipulative instructional materials like calculators and programmed computers. Similarly, a study conducted by Cramer (2016) found that concrete manipulatives, such as counting blocks, geometric shapes, fraction bars, and measuring tools like rulers and measuring tapes, are physical objects that students can handle and manipulate to understand abstract mathematical concepts.

Regarding the incorporation of printed materials such as textbooks, workbooks, or flashcards into mathematics instruction, 25% of respondents agreed and 20% strongly agreed. Meanwhile, 19% disagreed, 16% strongly disagreed, and 20% were unsure. These findings aligned with

Eisner (2013), who stated that printed materials such as textbooks, workbooks, worksheets, and flashcards are commonly used in primary classrooms to provide written explanations, practice exercises, and reference materials. Textbooks offer structured content aligned with the curriculum, while worksheets and flashcards provide opportunities for independent practice and reinforcement of skills.

When asked about the utilization of audiovisual materials such as educational videos or podcasts to enhance mathematical learning, 21% of respondents agreed and 31% strongly agreed. On the other hand, 10% disagreed, 15% strongly disagreed, and 23% were unsure. These findings were consistent with a study conducted by Mayer (2014), which found that audiovisual materials combine auditory and visual elements to enhance learning experiences. These may include educational videos, animations, podcasts, and multimedia presentations that explain mathematical concepts through narrated explanations, demonstrations, and visualizations. Audiovisual materials cater to diverse learning styles and reinforce understanding through multisensory experiences.

5.1.2 Discussion of the Findings on the Utilization of Instructional Materials During Mathematics Instruction in Upper Primary

Regarding the integration of digital simulations or interactive multimedia resources into mathematics instruction, 25% of respondents agreed and 20% strongly agreed. In contrast, 19% disagreed, 20% strongly disagreed, and 16% were unsure. These findings were consistent with studies done by Garcia and Kim (2020) and Taylor et al. (2023), who stated that the integration of instructional materials supports formative assessment practices and timely feedback mechanisms in mathematics instruction.

Among the respondents, 62% indicated that they utilized interactive whiteboards or virtual manipulatives to engage students in hands-on exploration during mathematics lessons, while 38% did not. The majority of the respondents agreed, which aligned with studies done by Brown and Nguyen (2019) and Lee et al. (2021). These studies revealed that interactive whiteboards, manipulative kits, and multimedia resources stimulate student curiosity and involvement in learning activities. Interactive features, such as drag-and-drop exercises and virtual

manipulatives, encourage students to explore, experiment, and collaborate, leading to increased motivation and interest in mathematics.

Regarding the provision of differentiated instructional materials to cater to diverse learning needs and preferences among students, 31% agreed and 29% strongly agreed. Conversely, 25% disagreed, and 15% strongly disagreed, indicating varied opinions among teachers on the implementation of differentiated instruction. These findings aligned with studies done by Hernandez and Martinez (2017) and Gupta et al. (2022), which highlighted the adaptability of instructional materials in providing multiple entry points and pathways for learning. Teachers can leverage a variety of materials, such as leveled texts, adaptive software, and flexible assignments, to accommodate varying readiness levels, learning styles, and language proficiencies among students.

5.1.3 Discussion of the Findings on the Influence of Utilization of Mathematics Instructional Materials on the Development of Mathematical Competencies in Upper Primary

Regarding the belief that the use of concrete manipulatives enhances students' conceptual understanding of mathematical concepts, 33% of respondents agreed and 26% strongly agreed. Conversely, 21% disagreed, 14% strongly disagreed, and 6% were unsure. The majority of the respondents agreed, which was consistent with studies conducted by Smith and Jones (2017) and Chen and Lee (2019), who highlighted the positive impact of concrete manipulatives on the development of mathematical competencies among students. Concrete materials, such as counting blocks, geometric shapes, and measuring tools, provide tangible representations that facilitate conceptual understanding and problem-solving skills.

When asked about the observed improvement in students' problem-solving skills due to the use of digital tools such as interactive whiteboards and educational apps during mathematics instruction, 11% agreed and 46% strongly agreed. In contrast, 19% disagreed, 13% strongly disagreed, and 11% were unsure. The majority of the respondents agreed with this statement, which aligned with a study conducted by Miller and Smith (2016), which found that digital

technologies promote mathematical reasoning, problem-solving, and computational skills among students.

In terms of whether printed materials such as textbooks and workbooks effectively support the development of students' mathematical competencies, 38% of respondents agreed and 19% strongly agreed. On the other hand, 12% disagreed, 12% strongly disagreed, and 19% were unsure. The majority agreed, and these findings were consistent with studies done by Adams and Clark (2019) and Kim and Park (2020), who stated that printed materials offer structured content, practice exercises, and reference materials aligned with curriculum standards. However, research suggests the need for careful selection and adaptation of printed materials to ensure relevance, accessibility, and engagement for all students.

5.2 Conclusion

Based on the findings regarding the types of instructional materials available for teaching mathematics, the study concluded that there was a higher representation of female respondents than males in the study. A significant proportion of respondents acknowledged the use of concrete manipulatives such as counting blocks and geometric shapes in their lessons. Audiovisual materials, such as educational videos, were widely supported, with the majority agreeing that they enhance mathematical learning by catering to diverse learning styles.

Regarding the utilization of instructional materials during mathematics instruction in upper primary, the study concluded that digital simulations and interactive multimedia resources are being incorporated, though there are mixed opinions on their effectiveness. The use of interactive whiteboards and virtual manipulatives received strong support, indicating that these tools are recognized for their ability to engage students in active learning.

On the influence of instructional materials on the development of mathematical competencies, The study concluded that concrete manipulatives were viewed as effective in enhancing students' conceptual understanding. Additionally, digital tools, such as interactive whiteboards and educational apps, were seen as beneficial for improving students' problem-solving skills, with most respondents acknowledging their positive impact. Finally, printed materials were recognized for their role in supporting mathematical competencies, though there was some

disagreement and uncertainty about their effectiveness, underscoring the need for careful selection and adaptation to meet diverse student needs.

5.3 Recommendations

Teachers should receive ongoing professional development on effectively integrating various instructional materials, including digital tools and audiovisual aids, to maximize their impact on student learning.

Schools should invest in providing a wider range of instructional materials, particularly digital simulations and interactive multimedia resources, to support differentiated instruction and address diverse learning needs.

Implementing formative assessment practices and timely feedback mechanisms can enhance the effectiveness of instructional materials and help teachers adjust their strategies to improve student outcomes.

Establishing a platform for teachers to share their experiences and best practices regarding the use of different instructional materials can foster a collaborative learning environment and improve instructional quality.

Regularly evaluating the effectiveness of instructional materials and making necessary adjustments based on student performance and feedback will ensure that teaching methods remain relevant and effective

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APPENDIX I: QUESTIONNAIRE FOR HEADTEACHERS AND TEACHERS

Dear Sir/Madam,

I am a student of Busitema University pursuing a degree in Primary Education .Iam conducting a research about the “ instructional materials usage and learners acquisition of mathematics competencies . as my case study. Findings from this research will hereafter be submitted to Busitema University as a partial fulfillment of the award of a degree in Primary Education

The information required is purely for academic purpose and will be treated with strict confidentiality . I therefore request you to spare some of your valuable time to fill this questionnaire.

Thank you.

.....

SECTION A: Bio Data of Respondent

Please tick the appropriate response below:-

1. Gender Male Female
2. Age A. 18-30 B. 31-40 C. 41-50 D. Above 50
3. Education qualification (tick the appropriate response)

| Level .of education | Response |
|---------------------|----------|
| a) Certificate | |
| b) Diploma | |
| c) Graduate | |
| d) Others (specify) | |

4. How long have you served this school ?

- A. Below 5 years B. 6-10 years C. 11- 15 years D. Above 15 years

SECTION B: The types of instructional materials available for teaching mathematics

5. Do you use concrete manipulatives such as counting blocks or geometric shapes in your mathematics lessons?

1 Strongly Agree

2. Agree

3. Disagree

4. Strongly disagree

5. Not sure

6. Are visual aids like charts, graphs, or diagrams regularly utilized to help students visualize mathematical concepts?

1. Strongly agree

2. Agree

3. Disagree

4. Strongly disagree

5. Not sure

7. Do you incorporate printed materials such as textbooks, workbooks, or flashcards into your mathematics instruction?

1. Strongly Agree

2. Agree

3. Disagree

4. Strongly disagree

5. Not sure

8. Do you integrate digital resources like educational websites or interactive multimedia programs in your mathematics lessons?

1. Strongly agree
2. Agree
3. Disagree
4. Strongly disagree
5. Not sure

9. Do you utilize audiovisual materials such as educational videos or podcasts to enhance mathematical learning?

1. Strongly agree
2. Agree
3. Disagree
4. Strongly disagree
5. Not sure

SECTION C: Instructional materials are utilized during mathematics instruction in upper primary.

10. Do you regularly use concrete manipulatives such as counting blocks or geometric shapes during your mathematics lessons?

1. Strongly agree
2. Agree
3. Disagree
4. Strongly disagree
5. Not sure

11. Are digital simulations or interactive multimedia resources integrated into your mathematics instruction?

1. Strongly agree

2 Agree

3. Disagree

4. Strongly disagree

5. Not sure

12. Do you incorporate visual aids like charts, graphs, or diagrams to help students visualize mathematical concepts?

1. Strongly agree

2 Agree

3. Disagree

4. Strongly disagree

5. Not sure

13. Do you utilize interactive whiteboards or virtual manipulatives to engage students in hands-on exploration during mathematics lessons?

1. Strongly agree

2. Agree

3. Disagree

4. Strongly disagree

5. Not sure

14. Do you provide differentiated instructional materials to cater to diverse learning needs and preferences among your students?

1. Strongly agree

2. Agree

3. Disagree

4. Strongly disagree

5. Not sure

15. Are assessment tasks embedded within instructional materials to monitor student progress and provide feedback?

1. Strongly agree

2. Agree

3. Disagree

4. Strongly disagree

5. Not sure

SECTION D: The influence of utilization of mathematics instructional materials on development of mathematical competencies in upper primary.

16. Do you believe that the use of concrete manipulatives, such as counting blocks and geometric shapes, enhances students' conceptual understanding of mathematical concepts?

1. Strongly agree

2. Agree

3. Disagree

4. Strongly disagree

5. Not sure

17. Have you observed an improvement in students' problem-solving skills as a result of using digital tools, such as interactive whiteboards and educational apps, during mathematics instruction?

1. Strongly agree

2. Agree

3. Disagree

4. Strongly disagree

5. Not sure

18. Do you think that printed materials, such as textbooks and workbooks, effectively support the development of students' mathematical competencies?

1 .Strongly agree

2. Agree

3. Disagree

4. Strongly disagree

5. Not sure

END

INTERVIEW GUIDE TO PUPILS

1.Which class are you.....

2.How old are you

.....

3.Can you please provide an overview of the types of instructional materials available for teaching mathematics in upper primary?

.....

.....

4.What specific types of instructional materials are commonly used in mathematics instruction at the upper primary level?

.....

.....

5.Could you describe some examples of concrete manipulatives that are frequently utilized in teaching mathematics to upper primary students?

.....

.....

6..In your experience, how prevalent are digital resources, such as educational apps and online tutorials, in mathematics instruction for upper primary students?

.....

.....

7 Are there any culturally relevant instructional materials used to teach mathematics in upper primary classrooms?

.....

.....

8.How do teachers decide which instructional materials to use for teaching specific mathematical concepts?

.....
.....
9. Have you observed any challenges or barriers to the effective utilization of instructional materials in mathematics instruction?

.....
.....

10. In your opinion, how does the utilization of instructional materials impact the development of mathematical competencies among upper primary students?

.....
.....

THANKS FOR SPARING YOUR TIME .