



**LOW ENROLLMENT OF GIRLS IN ADVANCED LEVEL
MATHEMATICS CLASSES IN TORORO DISTRICT**

BY

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Declaration

I **Khatete Sam** declare that this dissertation is my original work and to the best of my knowledge, it has never been submitted to any University or Institution for any academic award whatsoever.

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Approval

This research report titled: “Low enrollment of girls in advanced-level mathematics classes in Tororo district” has been submitted for the award of the Degree of Science and Education, Mathematics and Economics to Busitema University with my approval as supervisor.

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Date: 14/08/2024.....

Dr. Annet Kyomuhangi

Dedication

This study is dedicated to my family for the constant support and encouragement throughout my study. You were there for me each low and high moment of the entire period of the study, thank you very much. To my parents who always reminded and prayed for me to be strong and keep going when everything seemed to come to a standstill. I say thank you very much. To my siblings Annet, Ivan, Emily, Suzan and Emma for their constant encouragement and assistance.

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It is my desire and gift to acknowledge and thank the Almighty God for the life.

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Lastly my gratitude goes to my friends Khalayi Catherine, Waidah Julius, Ochom Isaac, Namugwere Sylvia, Wakibi Rahim, and MafabiNathan Wilson among others, my classmates of BSE, my discussion group mates not forgetting my roommate Watila Sam and all the head teachers in the schools where I collected my data.

However, despite the acknowledgement of the above mentioned contributions from different individuals in the production of this work, I remain solely responsible for errors and mistakes which might be found in this document.

May the Almighty God bless you all.

ACRONYMS AND ABBREVIATIONS

STEM: Science, Technology, Engineering, and Mathematics

Abstract

This study investigates the factors contributing to the low enrollment of the girl child in the advanced level in Mathematics classes in Tororo District in Eastern Uganda. Addressing the problem is crucial in order to reduce gender disparities in STEM fields and also increase the percentage of female students in the available career opportunities. Despite the efforts to promote gender equality, Tororo District has a persistent gender gap in the enrollment of the girl child in the advanced level specifically in the Mathematics classes. However, the findings are based on three specific objectives such as; To identify the causes of low enrollment of girls in advanced level mathematics, to evaluate current interventions and policies by Government, to propose solutions to increase girls' enrollment. The methodologies used in overcoming the challenge include; surveys, interviews, and focus group discussions with students, teachers, parents and other education stakeholders. Cultural norms and stereotypes, societal expectations and limited visibility of women in Mathematics fields were identified as key factors. A significant portion (60%) of the respondents noted the absence of extracurricular programs promoting awareness about advanced mathematics for girls. The low enrollment of girls in advanced mathematics is essential for gender equality and empowering young women particularly in Tororo District.

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CHAPTER ONE

INTRODUCTION

1.1 Background

The underrepresentation of girls in advanced level mathematics classes is a prevalent issue that has been identified in numerous studies globally. In Tororo District, this gender disparity is particularly alarming, as it not only affects the educational opportunities for girls but also hinders their future career prospects in science, technology, engineering, and mathematics (STEM) fields. This study aims to delve into the factors leading to the low enrollment of girls in advanced level mathematics classes in Tororo District, shedding light on this concerning issue and propose recommendations for intervention.

Socio-cultural norms and beliefs play a significant role in influencing girls' enrollment in advanced level mathematics classes in Tororo District. A study conducted by Akyeampong, Djangmah, and Oduro (2013) in Ghana found that cultural expectations and gender biases create barriers for girls pursuing mathematics education. Additionally, Kessels, Ruiter, and Nijhuis (2017) highlighted how gender stereotypes, societal expectations, and parental perceptions of gender roles limit girls' access to STEM education opportunities

The absence of visible female role models in mathematical professions is another crucial factor that influences girls' enrollment in advanced-level mathematics classes. Research by Baram-Tsabari and Yarden (2018) emphasized the positive impact of role models in encouraging girls to choose STEM-related fields. Moreover, a study by Eccles, Wigfield, Harold, and Blumenfeld (1993) revealed that having female mathematics teachers plays a significant role in inspiring girls' enrollment and success in mathematics.

Insufficient educational resources and opportunities can be a significant deterrent for girls' enrollment in advanced-level mathematics classes. Studies by Kessels et al. (2017) highlighted the lack of access to quality mathematics teaching, textbooks, and educational infrastructure. Additionally, Saniter and Gürbüz (2020) demonstrated the need for specialized STEM programs and opportunities targeted towards girls to foster their interest and motivation in mathematics.

Teachers play a critical role in shaping students' educational experiences and aspirations. However, research by Good, Aronson, and Inzlicht (2003) identified that teachers' stereotypical biases can unconsciously influence the opportunities given to girls in mathematics education. The underrepresentation of female teachers in mathematics may perpetuate these biases further.

Cultural perceptions of gender roles can strongly influence girls' enrollment in advanced level mathematics classes. In many societies, there is a traditional belief that certain subjects, like mathematics, are more suited for boys, while girls are expected to focus on subjects related to domesticity or the humanities. This perception can discourage girls from pursuing mathematics education and limit their opportunities in STEM fields. Research by Wille et al. (2018) highlighted the negative impact of cultural gender stereotypes on girls' performance and interest in mathematics.

Parents play a significant role in shaping their children's educational choices and career aspirations. Research by Rabenberg (2013) demonstrated that parental expectations and support for mathematics education positively influence girls' enrollment and achievement in mathematics. Conversely, parental stereotypes and biases against girls' abilities in mathematics can create barriers and discourage girls from pursuing advanced level mathematics classes.

Socioeconomic factors can also contribute to the low enrollment of girls in advanced level mathematics classes. Financial constraints, lack of access to quality education, and limited opportunities for extracurricular activities and enrichment programs can all negatively impact girls' interest and participation in mathematics. Research by Hammond, Rubiano Matulevich, Beegle, and Kumaraswamy (2020) underscored the importance of addressing socioeconomic barriers to promote gender equity in STEM education.

The lack of institutional support and gender-sensitive policies can be a significant barrier for girls' enrollment in advanced level mathematics classes. Research by UNICEF (2020) emphasized the importance of gender-responsive educational policies and supportive school environments in promoting girls' participation in STEM education.

This study aims to shed light on the factors contributing to the low enrollment of girls in advanced level mathematics classes in Tororo District. By thoroughly examining these factors, this research will provide valuable insights for educational policymakers and stakeholders to

address this gender disparity effectively. Interventions based on these findings can help create an inclusive and equitable learning environment that encourages and supports girls' enrollment and success in advanced level mathematics classes, thereby empowering them to pursue future opportunities in STEM fields.

1.2 Problem Statement

Performance of learners in mathematics at advanced level has generally improved Nationwide in the recent years and is now leading among the other subjects. This has made most learners at Advanced level opt for combinations with mathematics. However, the enrollment of girls in mathematics is still low. This is seen through comparing the enrollment of girls with boys as evidenced in (Kuloba, 2019; Nikwenseri Abel, 2011; Okello, 2017)'s report, there is low turn up of girls in advanced level in mathematics classes in Tororo District. Despite efforts to promote gender equality in education, there is a persistent disparity in the enrollment rates of girls compared to boys in advanced level in mathematics classes. This situation not only hampers the potential of girls to excel in this crucial subject but also perpetuates gender inequalities in higher education and career opportunities. It is therefore essential to identify the key factors that contribute to the underrepresentation of girls in advanced-level mathematics classes in Tororo District. This study will explore various potential factors, including cultural and sociocultural influences, parental attitudes and expectations, teacher biasness, lack of role models, and limited access to resources.

1.3 Objectives

1.3.1 General objective

To investigate factors leading to the low enrollment of girls in advanced level mathematics classes in Tororo District and identify innovative solutions to increase their enrollment.

1.3.2 Specific Objectives

1. To find out the causes of low enrollment of girls in advanced level mathematics classes in Tororo District.

2. To evaluate the effectiveness of current interventions and policies aimed at increasing girls' enrollment in advanced level mathematics.
3. To identify potential solutions to increase the enrollment of girls in advanced level mathematics classes in Tororo District.

1.4 Research questions

1. What are the causes of low enrollment of girls in advanced level mathematics classes in Tororo District?
2. How effective are the current interventions and policies aimed at increasing girls' enrollment in advanced level mathematics?
3. What are the potential solutions to increase the enrollment of girls in advanced level mathematics classes in Tororo District?

1.5 Significance and justifications of the study

1.5.1 Significance

The study is significant as it aims to investigate and potentially address any gender disparities in the enrollment of girls in advanced level mathematics classes. By understanding and tackling these disparities, the study can contribute to promoting gender equality in education.

By focusing on increasing the enrollment of girls in advanced mathematics classes, the study can help create a more inclusive and equitable educational environment where all students have equal opportunities to excel in STEM fields.

Encouraging more girls to enroll in advanced mathematics classes can empower them to pursue careers in STEM (Science, Technology, Engineering, and Mathematics) fields, where women are traditionally underrepresented. This can lead to greater diversity and innovation in these fields.

1.5.2 Justifications

The study has the potential to bring about positive social change by breaking down barriers that prevent girls from accessing advanced mathematics education. This can lead to a more diverse and skilled workforce in the future.

Economic Benefits: Increasing the enrollment of girls in advanced mathematics classes can contribute to building a more skilled workforce in STEM-related industries, which can drive economic growth and innovation in the region.

By focusing on improving the enrollment of girls in advanced mathematics classes, the study can contribute to the overall educational development of Tororo District, fostering a culture of academic excellence and achievement.

Overall, the study on the Enrollment of Girls in Advanced Level Mathematics Classes in Tororo District holds significant potential to promote gender equality, empower girls in STEM fields, and contribute to the social, economic, and educational development of the region

1.6 Theoretical framework

The theoretical framework that best informs this study is the Gender and Education framework. This framework focuses on understanding the unequal access and outcomes in education based on gender.

Various studies have been conducted in the past to understand the factors contributing to the low enrollment of girls in advanced level mathematics classes. One such study by Jones, Mendick, and Drury (2010) found that societal stereotypes and gender biases play a significant role in deterring girls from pursuing advanced mathematics courses. Another study by Smith (2012) highlighted the influence of teachers' attitudes and classroom dynamics in shaping girls' subject choices in mathematics.

To address this issue, previous studies have focused on interventions such as providing mentorship programs, promoting gender equality in school curriculum, and implementing affirmative action to increase the enrollment of girls in advanced level mathematics classes.

However, despite these efforts, there is still a gap in the literature regarding the low enrollment of girls in advanced level mathematics classes in Tororo district specifically. This study aims to fill this gap by exploring the unique factors that contribute to this issue in the context of Tororo district.

1.7 Scope of the study

This study investigates the various socio-cultural factors that influence the low enrollment of girls in advanced level mathematics classes in Tororo District. These factors may include societal norms, gender roles and stereotypes, cultural beliefs, and family expectations.

The study assesses the availability of resources for advanced level mathematics education in Tororo District and how they might contribute to the low enrollment of girls. Resources can include textbooks, teaching materials, technological tools, and infrastructure in schools.

The study also explores the attitudes of teachers, parents, and students towards girls' participation in advanced level mathematics education. This will include understanding the perceptions, biases, and expectations that these stakeholders may have towards girls' abilities and interests in mathematics.

The study specifically focuses on Tororo District as the research site, ensuring that data collected and findings are contextually relevant to the local area. The scope will involve collecting data from stakeholders including teachers, parents, and students through surveys, interviews, and observations. The study will also review existing literature on gender and mathematics education to provide a comprehensive understanding of the issue. The timeframe for the study will be determined based on the availability of data and resources.

CHAPTER TWO

LITERATURE REVIEW

In this chapter, an extensive review of the existing literature on the factors leading to the low enrollment of girls in advanced level mathematics classes in Tororo District will be presented. The focus of this literature review is based on the three study objectives; 1) To find out the causes of low enrollment of girls in advanced level mathematics classes in Tororo District. 2) To evaluate the effectiveness of current interventions and policies aimed at increasing girls' enrollment in advanced level mathematics. 3) To identify potential solutions to increase the enrollment of girls in advanced level mathematics classes in Tororo District. This review aims to provide a comprehensive understanding of the key factors affecting girls' enrollment in advanced level mathematics classes and to highlight potential areas for intervention and improvement.

2.1 Causes of low enrollment of girls in advanced level mathematics classes in Tororo District

The Causes of low enrollment of Girls in advanced level Mathematics classes in Tororo District has been studied by several scholars. According to the study conducted by Nikwenseri Abel (2011), found that gender stereotypes that associate mathematics with masculinity continue to prevail in many societies, influencing parents' decisions regarding their daughters' educational trajectories. Awino (2019) also found that parents often perceive mathematics as a more suitable subject for boys and may discourage their daughters from pursuing advanced level mathematics courses. Moreover, parents' own beliefs and experiences in mathematics also shape their attitudes towards their daughters' involvement in the subject (Gunderson, Ramirez, Levine, & Beilock, 2012).

Teachers play a significant role in influencing students' subject choices and self-perceptions. However, studies have highlighted the presence of teacher bias against girls in mathematics classrooms (Becker, 1981; Beilock, Gunderson, Ramirez, & Levine, 2010; Riegler-Crumb & Humphries, 2012). Hand, Rice, and Greenlee (2017) revealed that biased expectations and stereotypes held by teachers can adversely affect girls' confidence and beliefs in their mathematical abilities. Furthermore, classroom environments that lack gender diversity or perpetuate a male-dominated culture may discourage girls from actively participating in advanced-level mathematics classes (Muizelaar, 2013).

Adolescence is a critical period during which peers exert significant influence on individuals' attitudes and behaviors, including subject choices. Research by Jaremus (2020) suggests that girls' low enrollment in advanced level mathematics classes can be influenced by peer pressure, social norms, and the perception that mathematics is not a subject that aligns with their social identity. Another study by Dennehy and Dasgupta (2017) found that peer support and role models who challenge traditional gender norms in mathematics can help mitigate these negative influence factors.

Cultural beliefs and traditional gender roles can contribute to the low enrollment of girls in advanced level mathematics classes. A study by Teixeira, Galvao, Mota-Santos, and Carmo (2021) reported that in societies where domestic responsibilities are attributed mainly to females,

parents may prioritize girls' involvement in subjects that are considered more relevant to familial responsibilities. Another research by Reilly (2012) reported that cultural beliefs that associate mathematics and science with male domains also hinder girls' access to advanced-level mathematics education.

Socio-economic factors, such as limited financial resources and accessibility to educational opportunities, can also contribute to the low enrollment of girls in advanced level mathematics classes. A research by Nomaguchi and Milkie (2020) found that families facing economic challenges may prioritize spending on male children's education, perceiving it as a better return on investment. Also Aturupane, Shojo, and Ebenezer (2018) reported that limited access to resources, including textbooks, computers, and internet connectivity, can further disadvantage girls in pursuing advanced-level mathematics education.

2.2 Effectiveness of current interventions and policies aimed at increasing girls' enrollment in advanced level mathematics classes in Tororo District

Effectiveness of Current Interventions and Policies Aimed at Increasing Girls' Enrollment in Advanced Level Mathematics has been explored by some studies. A study conducted by Kafuko and Mukasa, (2020) on gender mainstreaming in education policies and practices: A case study of Uganda, explored the effectiveness of gender mainstreaming initiatives in education policies in Uganda, providing insights into how government interventions can impact girls' enrollment in advanced level mathematics. According Ministry of Education and Sports (Uganda). (2019). National Strategy for Girls' Education 2019-2024. The National Strategy for Girls' Education outlines specific goals and strategies to promote girls' participation and achievement in STEM subjects, including mathematics, offering valuable information on government efforts to address the enrollment gap. Nakabugo, M & Ntinda (2021)'s research paper investigated gender disparities in secondary school enrollment within Tororo District, shedding light on the local context and informing potential government interventions to increase girls' participation in advanced level mathematics. According to (UNESCO)(2022), Gender Equality in Education provides a comprehensive overview of gender equality issues in education in Uganda, including discussions on policy frameworks and initiatives aimed at promoting girls' access to STEM education. World Bank Group. (2023) also evaluated the impact of the project aimed at

improving girls' access to education in Uganda, highlighting key strategies implemented by the government to enhance girls' enrollment in STEM subjects like mathematics.

Adeyemo and Okeke-Uzodike, (2022), reviewed various school-based interventions designed to increase girls' participation in mathematics education, offering insights into effective approaches that can be implemented at the school level. Another study by Mugabi, C., and Nampijja, (2023)'s study examined specific strategies employed by secondary schools in Tororo District to promote girls' interest and participation in mathematics classes. This research paper assessed the impact of mentoring programs on girls' enrollment and performance in mathematics within Ugandan schools, highlighting the role of mentorship as a school-based intervention strategy. Tororo District Education Department Report (2024). The official report from the Tororo District Education Department provides insights into existing school-based interventions aimed at addressing gender disparities in advanced level mathematics classes within the district. Uganda Mathematics Teachers Association (UMTA) conference (2023), The proceedings offer valuable information on innovative teaching methods and practices discussed by educators to enhance girls' engagement and success in mathematics at the school level.

A study by Kabengele and Namutebi, (2022) explored the effectiveness of community-based initiatives aimed at supporting girls' mathematics learning through community engagement strategies. A study by the Uganda Ministry of Gender Labour and Social Development Community Sensitization Manual (2020), The manual provides guidelines for community sensitization programs aimed at promoting gender equality and empowering girls through increased participation in educational opportunities such as advanced-level mathematics classes.

2.3 Potential Solutions to the challenges leading to low enrollment of girls in advanced level mathematics classes in Tororo District

Potential solutions to Increase Enrollment of Girls in Advanced Level Mathematics Classes in Tororo District, has been undergone by some studies. Textbooks and curriculum resources are vital components for effective mathematics instruction. According to Schmoker (2018), high-quality textbooks are critical in supporting student learning by providing clear explanations, step-by-step solutions, and numerous practice problems. Additionally, Baker and Galanti

(2017) emphasized the need for curricula aligned with state and national standards, addressing advanced mathematical concepts and skills in an engaging and accessible manner.

The proliferation of online and digital resources has expanded the availability and accessibility of materials for advanced level mathematics education. Gunduz and Sillem (2021) highlighted the benefits of online platforms, such as interactive simulations, virtual manipulative and interactive textbooks, which enhance students' conceptual understanding and problem-solving abilities. Digital resources also offer personalized learning experiences, immediate feedback, and adaptive assessment, as mentioned by (Taylor, Yeung, and Basset, 2021).

To effectively teach advanced level mathematics, teachers require appropriate professional development and access to resources. Stearns (2019) emphasized the importance of ongoing professional development opportunities that enhance teachers' content knowledge and pedagogical approaches in advanced mathematics instruction. Additionally, Ko and Rossen (2017) highlighted the significance of teacher resources, such as lesson plans, activity guides, and online communities, in supporting teachers' instructional practices.

Incorporating technology, such as graphing calculators, computer software, and online tools, into mathematics instruction has proven to be beneficial. McCulloch, Hollebrands, Lee, Harrison, and Mutlu (2018) showcased how graphing calculators enhanced students' understanding of complex functions, equations, and mathematical modeling. Similarly, the integration of computer software and online tools, as highlighted by Al Mamun and Lawrie (2023), can provide interactive experiences, visual representations, and simulation-based activities, fostering deeper conceptual understanding.

Ensuring equitable access to resources for advanced level mathematics education is crucial to bridge the achievement gap. Navaneeth and Siddiqui (2022) outlined the need for addressing socioeconomic disparities, providing equal opportunities for all students, and implementing inclusive practices to enhance resource availability. This involves supporting schools in low-income areas and promoting open educational resources (OER) to reduce barriers and enhance access to quality materials.

Educators and policymakers should prioritize investing in high-quality resources and ensure equitable distribution to promote student success in advanced-level mathematics education.

CHAPTER THREE

METHODOLOGY

This chapter presents the methodology employed in the proposed study to examine the factors contributing to the low enrollment of girls in advanced level mathematics classes in Tororo District. The chapter outlines the research design, population and sample, data collection methods, and data analysis techniques used to investigate the research questions and achieve the study's objectives: 1) To find out the causes of low enrollment of girls in advanced level mathematics classes in Tororo District. 2) To evaluate the effectiveness of current interventions and policies aimed at increasing girls' enrollment in advanced level mathematics. 3) To identify potential solutions to increase the enrollment of girls in advanced level mathematics classes in Tororo District.

3.1 Research Design

The study adopted a mixed-methods research design, which combines both qualitative and quantitative approaches. This approach allows for a comprehensive examination of the factors influencing girls' low enrollment in advanced level mathematics classes, ensuring a deep understanding of the complex issue at hand. The qualitative approach provides insights into the girls' perspectives and experiences, whereas the quantitative approach tends to offer statistical evidence and numerical representations.

3.2 Population and Sample

The target population for this study consists of girls enrolled in secondary schools offering advanced-level mathematics classes in Tororo District, along with their mathematics teachers, school administrators, and parents. Due to logistical constraints, a sample of schools has been selected using stratified random sampling technique. Within each selected school, purposive sampling has been used to select participants based on their relevance and expertise in the study area.

3.3 Data Collection Methods

To collect data, this study utilizes a combination of surveys, interviews and focus groups. Firstly, a structured questionnaire was distributed to girls, mathematics teachers, school administrators, and parents to capture quantitative data on various factors contributing to the low enrollment of girls in advanced level mathematics classes. Secondly, semi-structured interviews were also conducted with selected participants to gather in-depth qualitative insights into their experiences and perspectives. Lastly, focus group discussions were held with groups of girls and teachers to encourage an interactive exploration of the factors influencing girls' enrollment in mathematics classes.

3.4 Data Analysis Techniques

The collected data is being analyzed using both quantitative and qualitative data analysis techniques. For the quantitative data obtained from the survey, descriptive statistics such as frequencies and percentages are used to summarize the data. Additionally, inferential statistics, such as chi-square tests and regression analysis, has been employed to examine the relationships between different variables. For the qualitative data from interviews and focus group discussions, thematic analysis was conducted to identify recurring patterns, themes, and emerging concepts.

3.5 Validity and Reliability

To ensure the validity of the study, multiple data collection methods were employed, allowing for the triangulation of data from different sources. The researchers also established trustworthiness by member checking, where participants were given the opportunity to review and validate the findings. Additionally, expert review and peer debriefing was utilized to enhance the credibility and rigor of the study. Measures to enhance reliability include pre-testing of instruments, conducting pilot studies, and establishing intercoder agreement for the qualitative data analysis.

3.5 Ethical Considerations

Ethical approval was sought from the relevant research ethics committee before commencing the study. Informed consent was obtained from all participants, ensuring their voluntary

participation, confidentiality, and anonymity. Participants were made aware of their rights to withdraw from the study without any negative consequences.

CHAPTER FOUR

RESULTS AND INTERPRETATION

This chapter presents the results and interpretation of the research conducted to address the objectives of 1) determining the causes of low enrollment of girls in advanced level mathematics classes, 2) evaluating the effectiveness of current interventions and policies, and 3) identifying potential solutions to increase girls' enrollment in advanced level mathematics in Tororo District. Through the analysis of data collected from questionnaires and interviews, this chapter aims to provide insights into the factors influencing girl' enrollment in mathematics education and the strategies necessary to address the challenges faced in Tororo District.

4.1 Causes of Low Enrollment of Girls in Mathematics in Tororo Schools

4.1.1 Cultural Norms and Stereotype

Factors Contributing to Cultural Norms and Stereotypes	Frequency of Mention (n=50)	Percentage (%)
Societal Expectations	30	30
Perceived Gender Roles	25	25
Cultural Beliefs	20	20

Table 4. 1: Showing Cultural Norms and Stereotypes as a possible Causes of Low Enrollment of Girls in Mathematics in Tororo Schools

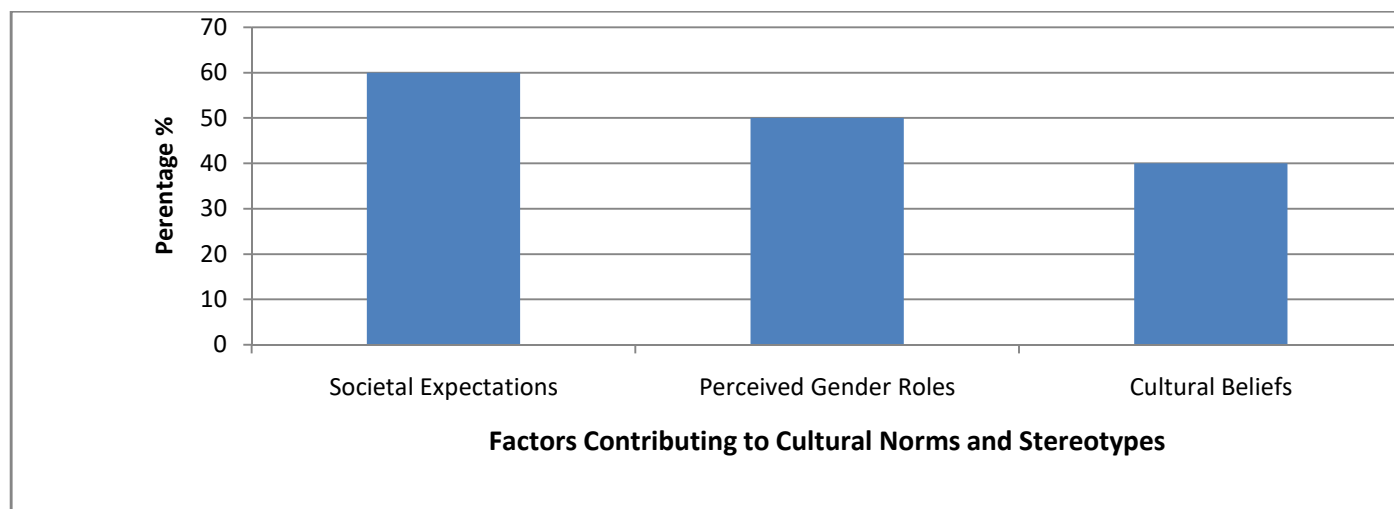


Figure 1: Showing Causes of low enrollment of Girls in Tororo District

Based on the survey responses from 50 respondents, cultural norms and stereotypes were identified as significant factors contributing to the low enrollment of girls in advanced-level mathematics classes in Tororo District. Societal expectations, perceived gender roles, and cultural beliefs emerged as the most commonly mentioned barriers impacting girls' pursuit of mathematics education.

4.1.2 Lack of Female Role Models in Mathematics

Challenges Related to Lack of Female Role Models	Frequency of Mention (n=50)	Percentage (%)
Limited Visibility of Women in Math Fields	28	56%
Lack of Mentorship Opportunities	22	44%
Underrepresentation in STEM Careers	18	36%

Table 4. 2: Showing Lack of Female Role Models in Mathematics as a possible Causes of Low Enrollment of Girls in Mathematics in Tororo Schools

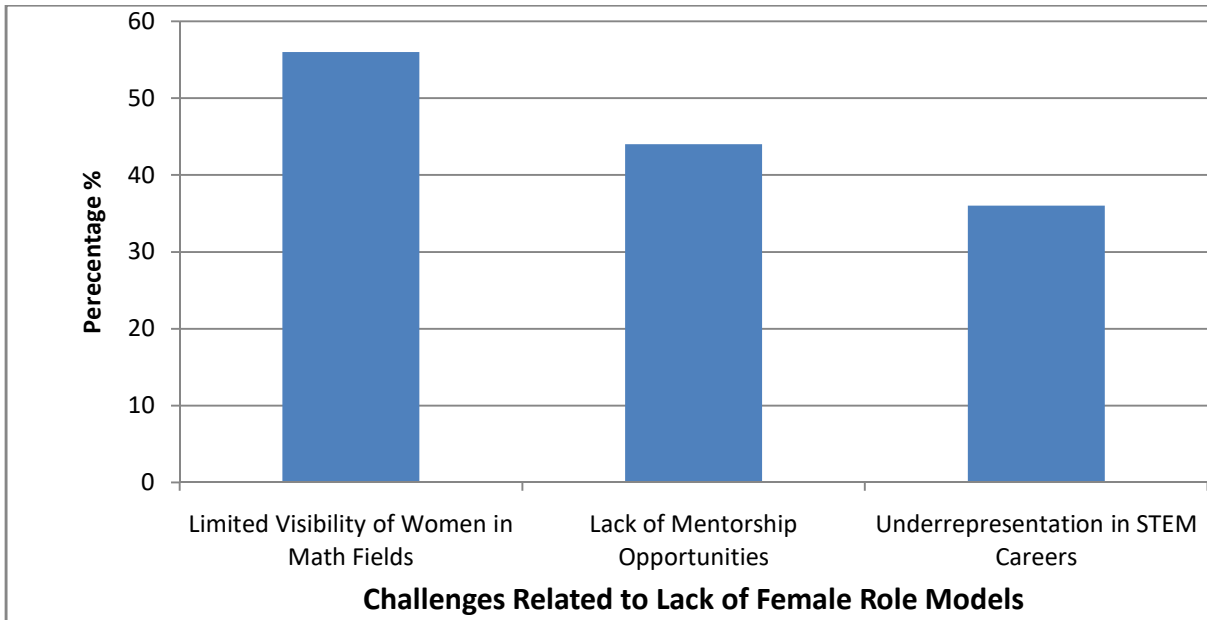


Figure 2: showing Lack of Female Role Models in Mathematics

The data highlights the lack of female role models in mathematics as a prominent issue affecting girls' interest in advanced-level math classes. The majority of respondents cited limited visibility of women in math fields as the primary challenge, followed by inadequate mentorship opportunities and underrepresentation in STEM careers.

4.1.3 Gender Bias in Teaching Methods

Identified Gender Bias in Teaching Methods	Frequency of Mention (n=50)	Percentage (%)
Differential Attention in Classrooms	20	40%
Lack of Inclusive Teaching Strategies	25	50%
Stereotyping by Educators	15	30%

Table 4. 3: Showing Gender Bias in Teaching Methods as a possible Causes of Low Enrollment of Girls in Mathematics in Tororo Schools

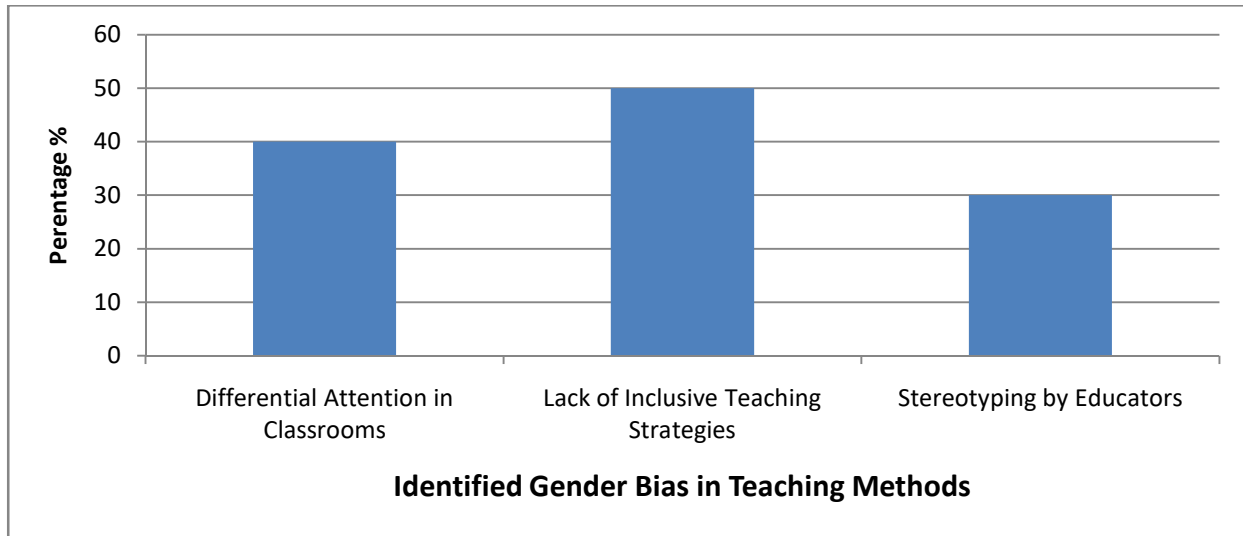


Figure 2: Showing Gender Bias in Teaching Methods

Gender bias in teaching methods was identified as another significant factor impacting girls' enrollment in mathematics. Respondents highlighted issues such as differential attention in classrooms, lack of inclusive teaching strategies, and educator stereotyping as obstacles that hinder girls' participation in advanced level mathematics classes.

4.2 Effectiveness of Current Interventions to Enhance Girls Enrollment in Advanced Mathematics

4.2.1 Government Programs to Encourage Girls' Enrollment

Government Programs to Encourage Girls' Enrollment	Frequency of Responses	Percentage (%)
Yes	25	50
No	25	50

Table 4. 3: Showing Government Programs to Encourage Girls' Enrollment

The data shows a split in responses regarding the presence of government programs encouraging girls' enrollment in advanced level mathematics. This suggests that there might be a need for more targeted interventions from authorities to promote equal participation in advanced mathematics education.

4.2.2 Encouragement from Teachers and Parents

Encouragement by Teachers and Parents	Frequency of Responses	Percentage (%)
Yes, always	15	30
Yes, sometimes	20	40
No, rarely	10	20
No, never	5	10

Table 4. 4: Showing Encouragement from Teachers and Parents

The results indicate that while a significant number of respondents perceive encouragement from teachers and parents for girls to pursue advanced level mathematics education, there is still a portion of respondents who report limited support. This suggests a need for increased efforts from educators and parents to motivate girls in their mathematical pursuits.

4.2.3 School-Based and Community-Based Interventions

School-Based Interventions	Frequency of Responses	Percentage (%)
Yes	18	36
No	32	64

Community-Based Initiatives	Frequency of Responses	Percentage (%)
Yes	10	20
No	40	80

Table 4. 5: Showing School-Based and Community-Based Interventions

The findings highlight a lack of school-based and community-based interventions aimed at supporting girls' mathematics education in Tororo District. This gap indicates a potential area for

improvement through the introduction of targeted programs and initiatives to enhance girls' enrollment in advanced mathematics classes.

4.2.4 Initiatives to Encourage Girls to Enroll in Advanced-Level Mathematics

Initiatives to Encourage Girls' Enrollment	Frequency of Responses	Percentage (%)
Yes	15	30
No	35	70

Table 4. 6: Showing Initiatives to Encourage Girls to Enroll in Advanced-Level Mathematics

The respondents largely indicated a lack of specific measures or initiatives in place to encourage girls to enroll in advanced level mathematics classes in Tororo District. This lack of targeted efforts emphasizes the need for the implementation of strategies that aim to increase girls' participation and interest in advanced mathematics education.

4.3 Potential Solutions to Enhance Enrollment of Girls in Tororo Schools

4.3.1 Availability of Textbooks and Learning Materials

Availability of Textbooks and Learning Materials	Frequency of Responses	Percentage (%)
Yes, more than enough	10	20
Yes, just enough	15	30
No, but there's a reasonable amount	20	40
No, very limited availability	5	10

Table 4. 8: Showing Availability of Textbooks and Learning Materials

The data suggests that a significant proportion of respondents perceive a reasonable availability of textbooks and learning materials for advanced level mathematics classes in Tororo District.

However, there are concerns raised by a minority regarding the limited availability of these resources, which may impact girls' enrollment in such courses.

4.3.2 Qualification of Mathematics Teachers

Availability of Qualified Teachers	Frequency of Responses (n=50)	Percentage (%)
Yes, more than enough	8	16
Yes, just enough	12	24
No, but there's a reasonable number	18	36
No, very limited availability	12	24

Table 4. 9: Showing Qualification of Mathematics Teachers

The responses indicate mixed views on the availability of qualified mathematics teachers in Tororo District. While majority believe that there is a reasonable number of qualified teachers, a significant portion of respondents expressed concerns about limited availability. This could potentially impact girls' enrollment in advanced mathematics classes.

4.3.3 Extracurricular Programs for Girls in Mathematics

Availability of Extracurricular Programs	Frequency of Responses (n=50)	Percentage (%)
Yes	20	40
No	30	60

Table 4. 7: Showing Extracurricular Programs for Girls in Mathematics

The findings reveal that a majority of respondents do not perceive the existence of extracurricular programs or initiatives specifically promoting advanced level mathematics for girls in Tororo District. This lack of supplementary activities may hinder girls' interest and engagement in mathematics education at an advanced level. Additional efforts may be needed to provide such opportunities for female students.

CHAPTER FIVE

DISCUSSION OF RESULTS

This study aimed to address the following key research questions; 1) what are the causes of low enrollment of girls in advanced level mathematics classes in Tororo District? 2) How effective are the current interventions and policies aimed at increasing girls' enrollment in advanced level mathematics? 3) What are the potential solutions to increase the enrollment of girls in advanced-level mathematics classes in Tororo District?

In this section, we will analyze the results obtained from the survey conducted among 50 respondents in Tororo District to gain insights into the factors influencing the low enrollment of girls in advanced mathematics classes, evaluate the effectiveness of existing interventions, and explore potential solutions to enhance girls' participation in advanced mathematics education.

5.1 Causes of low enrollment of girls in advanced level mathematics classes in Tororo District?

Table 1 highlights that among the factors contributing to cultural norms and stereotypes affecting girls' enrollment in mathematics in Tororo schools, societal expectations were mentioned most frequently (60%), followed by perceived gender roles (40%) and cultural beliefs (40%). These findings indicate a strong societal influence on girls' participation in advanced level mathematics classes. The high percentage of responses citing societal expectations underscores the need to address ingrained cultural norms to promote gender equality in mathematics education.

In the context of the lack of female role models in mathematics, table 2 reveals that limited visibility of women in math fields was the most commonly mentioned challenge (56%), followed by the lack of mentorship opportunities (44%) and underrepresentation in STEM careers (36%). These results emphasize the importance of increasing visibility and support for women in mathematics to inspire girls' interest in pursuing advanced level math classes. Addressing the lack of role models and mentorship opportunities could encourage more girls to engage with mathematics.

The data presented in the table 3 on gender bias in teaching methods shows that respondents identified various issues, with lack of inclusive teaching strategies being mentioned most frequently (50%), followed by differential attention in classrooms (40%) and educator stereotyping (30%). These results highlight the significant impact of biased teaching practices on girls' enrollment in mathematics education. Addressing these issues by promoting inclusive teaching strategies and raising awareness about gender bias can help create a more equitable learning environment for all students.

In summary, the tables 1,2 and 3 provide valuable insights into the factors contributing to the low enrollment of girls in advanced level mathematics classes in Tororo District. By examining cultural norms and stereotypes, the lack of female role models in mathematics, and gender bias in teaching methods, the research report identifies critical areas for intervention to improve girls' participation and success in mathematics education. Addressing these issues is essential for promoting gender equality and diversity in the field of mathematics.

5.2 Effectiveness of the current interventions and policies aimed at increasing girls' enrollment in advancedlevel mathematics?

Table 4 reveals an equal split among respondents regarding the presence of government programs aimed at encouraging girls' enrollment in advanced level mathematics. This result suggests a lack of consensus on the effectiveness of current government initiatives in promoting gender equality in mathematics education. The data indicates a potential opportunity for policymakers to review and enhance existing programs or introduce new initiatives tailored to address the specific challenges hindering girls' enrollment in advanced math classes.

In Table 5, the data shows that while a significant number of respondents perceive encouragement from teachers and parents for girls to pursue advanced level mathematics education, there is still a notable portion reporting limited support. This highlights the crucial role that educators and parents play in shaping girls' attitudes towards mathematics. It underscores the importance of continuous support, encouragement, and mentorship from teachers and parents to motivate and empower girls to excel in advanced mathematics courses.

Table 6 indicates a deficiency in school-based and community-based interventions supporting girls' mathematics education in Tororo District. With a majority of respondents reporting the absence of such programs, there is a clear opportunity to implement targeted initiatives at both school and community levels to facilitate girls' enrollment and success in advanced mathematics classes. Strengthening partnerships between schools, communities, and relevant stakeholders could help create a more conducive environment for girls to thrive in mathematics education.

Table 7 demonstrates that a significant proportion of respondents indicated a lack of specific measures or initiatives to encourage girls' enrollment in advanced-level mathematics classes. This data underscores the need for proactive strategies and interventions to address the barriers that prevent girls from pursuing advanced math education. By implementing tailored initiatives that promote girls' interest, confidence, and participation in mathematics, educational institutions and policymakers can work towards achieving greater gender parity in advanced mathematics classes.

In conclusion, the findings from the tables 4, 5, 6 and 7 on government programs, encouragement from teachers and parents, school-based and community-based interventions, and initiatives to encourage girls' enrollment highlight the existing gaps and opportunities to enhance girls' participation in advanced level mathematics classes in Tororo District. By addressing these areas through targeted interventions, policy reforms, and community engagement, stakeholders can work towards creating a more inclusive and supportive environment that empowers girls to excel in mathematics education.

5.3 Potential solutions to increase the enrollment of girls in advanced-level mathematics classes in Tororo District?

The data from Table 8 suggests that while a significant portion of respondents believe there is a reasonable amount of textbooks and learning materials available for advanced level mathematics classes in Tororo District, there is still a minority (10%) expressing concerns about very limited availability. The perceived adequacy or inadequacy of these resources could impact girls' enrollment in advanced math classes. Ensuring equitable access to high-quality textbooks and learning materials is essential to support girls' education and interest in mathematics.

Table 9 presents mixed views on the availability of qualified mathematics teachers in Tororo District. While a majority of respondents believe there is a reasonable number of qualified teachers, a significant portion (24%) express concerns about limited availability. The qualifications of teachers play a crucial role in shaping students' learning experiences, especially in subjects like mathematics. Addressing any shortages or gaps in teacher qualifications is important to enhance the quality of education and encourage girls to pursue advanced mathematics courses.

The data in Table 10 reveals that a majority of respondents (60%) do not perceive the existence of extracurricular programs or initiatives specifically designed to promote advanced level mathematics for girls in Tororo District. This lack of supplementary activities tailored to girls' interests in mathematics could potentially limit their opportunities for further exploration and engagement in the subject. Introducing extracurricular programs focused on math for girls can help spark interest, provide support, and foster a sense of community among female students interested in advanced mathematics.

In conclusion, the tables 8, 9 and 10 on availability of textbooks and learning materials, qualification of mathematics teachers, and extracurricular programs for girls in mathematics shed light on the existing challenges and opportunities to enhance the enrollment of girls in advanced level mathematics classes in Tororo District. Addressing issues such as resource availability, teacher qualifications, and providing tailored extracurricular support can contribute to creating a more inclusive and supportive environment for girls to excel in mathematics education. Additional interventions and policies may be required to support and encourage girls to pursue advanced mathematics courses effectively.

CONCLUSION AND RECOMMENDATIONS

Conclusion

The research study has provided valuable insights into the challenges and opportunities in promoting gender equity in mathematics education. Through the analysis of causes, effectiveness of current interventions, and potential solutions, it is evident that concerted efforts are required to address the barriers hindering girls' enrollment and success in advanced math courses.

By implementing targeted interventions, fostering collaboration among stakeholders, and promoting a supportive learning environment, it is possible to improve girls' participation and performance in advanced-level mathematics in Tororo District. Empowering girls through education not only benefits individuals but also contributes to the overall socio-economic development of the community.

Addressing the low enrollment of girls in advanced mathematics classes requires a multi-faceted approach that addresses systemic challenges, empowers stakeholders, and advocates for gender equality in education. By working together towards these objectives, Tororo District can create a more inclusive and diverse educational landscape that ensures equal opportunities for all students to excel in mathematics.

Recommendations

Based on the findings and analysis conducted for each of this study's three objectives, the following recommendations were proposed.

Conduct a comprehensive review to identify the underlying causes of low enrollment of girls in advanced level mathematics classes in Tororo District. This should involve analyzing factors such as societal norms, educational policies, teacher attitudes, and student perceptions to develop targeted interventions.

Strengthen collaboration between educational institutions, government agencies, and community stakeholders to enhance the effectiveness of current interventions aimed at increasing girls'

enrollment in advanced mathematics. This can be achieved through regular monitoring and evaluation of existing programs to identify areas for improvement and adaptation.

Implement initiatives to promote gender equality in mathematics education, focusing on fostering a supportive and inclusive learning environment for girls in Tororo District. This may involve training teachers on gender-sensitive teaching approaches, providing mentorship programs for female students, and raising awareness about the importance of girls' participation in advanced mathematics.

Enhance teacher and parent engagement in supporting girls' mathematical pursuits by organizing workshops, seminars, and outreach programs to promote the value of girls' education in mathematics. Encouraging positive role models and creating opportunities for mentorship can help inspire and motivate girls to enroll in advanced level mathematics classes.

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APPENDIX

Questionnaire

BUSITEMA UNIVERSITY

FACULTY OF SCIENCE AND EDUCATION

NAGONGERA CAMPUS

DEPARTMENT OF MATHEMATICS

Introduction

I am KHATETE SAM, third year student at Busitema University pursuing a Bachelors Degree in Science Education (MATH & ECON) carrying out a study:LOW ENROLLMENT OF GIRLS IN ADVANCED-LEVEL MATHEMATICS CLASSES IN TORORO DISTRICT

Thank you for participating in this research. The purpose of this questionnaire is to gather information about your knowledge, attitudes, and practices regarding the factors leading to the low enrollment of girls in advanced level mathematics classes in Tororo district. Your participation in this study is greatly appreciated. Please answer the following questions to the best of your ability.

Section 1: causes of low enrollment of girls in mathematics in Tororo schools

1. Which of the following factors do you believe contribute to the low enrollment of girls in advanced level mathematics classes?
 - a) Cultural norms and stereotypes
 - b) Lack of female role models in mathematics
 - c) Gender bias in teaching methods

d) Pressure to focus on domestic responsibilities

e) Other (please specify) _____

2. In your opinion, how influential are cultural norms and stereotypes in discouraging girls from pursuing advanced level mathematics education?

a) Not influential at all

b) Slightly influential

c) Moderately influential

d) Highly influential

e) Extremely influential

3. Are there any cultural beliefs or traditions in your community that discourage girls from studying advanced level mathematics?

a) Yes

b) No

4. Do you think the lack of female role models in mathematics affects girls' interest in advanced level mathematics education?

a) Yes

b) No

5. How do you perceive the gender bias in teaching methods in advanced level mathematics classes?

a) Non-existent

b) Very minimal

c) Moderate

d) Significant

e) Very significant

Section 2: Potential solutions to enhance enrollment of girls in Tororo schools

6. Are there sufficient textbooks and learning materials available for advanced level mathematics classes in Tororo District?
 - a) Yes, more than enough
 - b) Yes, just enough
 - c) No, but there's a reasonable amount
 - d) No, very limited availability

7. Are there enough qualified mathematics teachers in Tororo District to support advanced level mathematics education?
 - a) Yes, more than enough
 - b) Yes, just enough
 - c) No, but there's a reasonable number
 - d) No, very limited availability

8. Are there any extracurricular programs or initiatives promoting advanced level mathematics for girls in Tororo District?
 - a) Yes
 - b) No

9. Is there sufficient number of computers or other technology resources available for advanced level mathematics education?
 - a) Yes, more than enough
 - b) Yes, just enough

c) No, but there's a reasonable amount

d) No, very limited availability

10. Do you think the lack of resources for advanced level mathematics education contributes to the low enrollment of girls?

a) Yes

b) No

Section 3: Effectiveness of the current interventions to enhance girls enrolment in advanced mathematics.

11. Are there government programs encouraging girl's enrollment in advanced level mathematics as boys in your school?

a) Yes

b) No

12. Are girls encouraged by teachers and parents to pursue advanced level mathematics education?

a) Yes, always

b) Yes, sometimes

c) No, rarely

d) No, never

13. Are there school-based interventions designed to increase girls' participation in mathematics education, at your school level in Tororo District?

a) Yes

b) No

14. Are there any Community-based initiatives aimed at supporting girls' mathematics learning through community engagement strategies in Tororo District?

a) Yes

b) No

15. Are there any specific measures or initiatives in place to encourage girls to enroll in advanced level mathematics classes in Tororo District?

a) Yes

b) No

Thanks for your participation and time