

Gender and Education: Evaluating Gender Mainstreaming Practices in Curriculum Implementation in Kenya

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Protocol for Evaluating Gender Mainstreaming Practices in Curriculum Implementation in Kenya

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List of acronyms

APHRC	African Population and Health Research Center
CGD	Center for Global Development
CSOs	Civil Society Organizations
EFA	Education for All
EMIS	Education Management Information System
FAWE	Forum for African Women Educationalists
FGDs	Focus Group Discussions
GIC	Gender Integration Continuum
KIIs	Key Informant Interviews
KNBS	Kenya National Bureau of Statistics
KNEC	Kenya National Examinations Council
MoE	Ministry of Education
NER	Net Enrollment Ratio
NGEC	National Gender Equality Commission
QCA	Qualitative Comparative Analysis
SAGAs	Semi-Autonomous Government Agencies
TPD	Teacher Professional Development
UNESCO	United Nations Educational, Scientific and Cultural Organization

Abstract

Over the years, Kenya has made progress in promoting gender access, equality, and equity in education through policy and legislative reforms that target empowerment for effective participation and contribution to national development. The overall outcome of this is increased representation of women in various institutions. However, evidence indicates that women continue to face systemic barriers and challenges that inhibit fair access, equality, and equity in education. Some of these challenges emanate from shortcomings in the education system; such as the curriculum, teacher training, and ineffective pedagogical approaches that consequently exacerbate the systemic barriers and challenges faced by women and girls. There is a dearth of empirical evidence on gender mainstreaming practices being implemented in classrooms in Kenya as part of efforts to promote gender access, equality, and equity in education. Therefore to address the research gap, this exploratory study seeks to examine three issues: 1) how gender mainstreaming practices are implemented in the teacher training programs; 2) how gender mainstreaming is practiced in primary and secondary classrooms in Kenya (pedagogy, instruction, and interactions), and 3) to explore how the basic education curriculum implementation promotes gender equity. We will utilize a mixed-methods sequential exploratory design to explore the effect of observed gender mainstreaming practices in classrooms, teacher-training programs, and in the basic education curriculum as well as the relationships between the aspects. Data for the study will consist of both qualitative (focus group discussion, key informant interviews) and quantitative (institutional questionnaire, assessments, classroom observations). The data will be collected at the school level (250), as well as among education managers at both county and national education offices. The data analysis is expected to generate evidence on the impact of gender mainstreaming practices on learners' outcomes in Math, English, and Sciences as well as a deep understanding of the nature of the gender mainstreaming practices. The study will provide implications and recommendations for effective gender mainstreaming policies and practice responses.

This study has a budget of USD 466,626.

1. Introduction

Global policies and education interventions implemented to achieve the Education For All (EFA) goals, Millennium Development Goals (MDG 2 and 3 and the Sustainable Development Goals 4 have been more focused on achieving gender parity in access to education and attainment (Aikman & Rao, 2012; United Nations, 2015). These education policies and interventions have consequently resulted in improved access to education. For instance, the primary school net enrolment rate in the developing regions improved from 83% in 2000 to 91% in 2015, with Sub-Saharan Africa (SSA) recording the highest improvement of 20 percentage points from 60% in 2000 to 80% in 2015 (UN, 2015). The literacy rates among youth aged 15-24 have continued to increase with a marked decrease in the literacy gender gap as a result of improved school attendance (UN, 2015). Kenya has also recorded improvements in school enrollment for both girls and boys attributed to the policies and strategies initiated by the Ministry of Education (Mumiukha et al., 2015). The primary school Net Enrollment Ratio (NER), the proportion of pupils completing primary education, and literacy levels among 15-24-year-olds have all registered remarkable improvements from 67.8%, 57.7%, and 78.5% in 2000 to 88.2%, 80.3%, and 94.4% in 2014 respectively, as a result of policies such as the free primary education (Government of Kenya, 2016).

Since independence, policy and legislative reforms have been implemented in Kenya as the Government seeks to promote gender access, equality, and equity in education, for example, the Education and Training Sector Gender Policy (Republic of Kenya, 2015). The goal of the policy is to promote gender equality issues concerning access, equity, and equality in the education sector and to enhance empowerment for effective participation and contribution to national development by all. The National Gender and Equality Commission (2011) is an Act of Parliament that was constituted in August 2011 and tasked with the responsibility of reducing gender inequalities, coordinating, and facilitating the mainstreaming of gender issues, persons living with disability, and other marginalized groups in the national development agenda. The Ministry of Education has established a gender in education unit to coordinate and ensure gender responsiveness in its activities (Government of Kenya, 2016). Currently, the State Department for Gender in the Ministry of Public Service and Gender is tasked with promoting gender mainstreaming in national development processes and championing the socio-economic empowerment of women. The State Department's mandate is guided by the National Policy on Gender and Development (NPDG). The NPDG's main objective is to achieve gender equality and women's empowerment in national development thus increasing the participation of women and men, boys, and girls, vulnerable and marginalized groups hence contributing to the attainment of sustainable development (Republic of Kenya, 2019). The Government of Kenya has also implemented policies and laws such as affirmative action that have led to an increase in the number of women in wage employment from 29.5% in 2000 to 36.5% in 2014 and enhanced representation in parliament (Kaimenyi, Kinya, & Chege, 2013). In addition to policy and legislative reforms, the Government has rolled out several interventions such as low-cost boarding schools and mobile schools in Arid and Semi-Arid Lands

(ASALs), in addition to Free Primary Education (FPE) in 2003, and Free Day Secondary Education (FDSE) in 2008. Other interventions include the re-entry for girls who drop out of school due to pregnancy among other reasons, affirmative action in bursary allocation, and the appointment of qualified female administrators. All these efforts seek to promote equal access to education for both boys and girls. An evaluation of the 2019 gender policy highlights gaps in the promotion of gender equality in Kenya that are attributable to disparities in education and economic opportunities, representation, and adequate access to health (Muigua, 2020).

2. Problem Statement

The implementation of the legislative and policy intervention in Kenya to promote gender parity, access, equity, quality, and equality in education has mainly focused on the representation of women in various institutions. These are key steps towards attaining the SDGs 4 and 5 on quality education and gender equality respectively, as well as the Agenda 2063¹ of the Africa Union (UNDP, 2016). The intended outcome of the policy interventions in Kenya is greater representation of women and an increase in opportunities for boys and girls in schools and colleges. The government continues to grapple with challenges to address gender equality in the education sector. Therefore, many women and girls continue to face systemic barriers and challenges in access, equity, and equality in education, as the available policy guidelines are less clear on the implementation strategies that could best achieve gender equality in education. Gender parity in education cannot be realized fully if the home environments, communities, policy contexts, school settings, teaching, and learning processes do not promote inclusivity, fairness, and equal opportunities for both boys and girls. The common barriers to gender equality include socio-cultural and religious beliefs, attitudes and practices, poverty, child labor, poor learning environment, lack of role models, the prevalence of HIV and AIDS infection and lack to access to care and treatment, curriculum deficiencies, pedagogical approaches, and learner's attitudes (Ministry of Education Science and Technology, [MoEST], 2015). The education sector has a major role to play as it is at the intersection of the various segments of society and utilizes a standardized curriculum that reaches the majority of learners at different levels in society. It is important that educational practices including; pedagogical practices utilized by teachers, curriculum materials, teaching and learning materials, and teacher training curriculum reflect practices that promote and encourage gender parity.

It is imperative to develop models that enable both girls and boys to participate equally in the learning process (Akpakwu & Bua, 2014). Examples of successful models include the ongoing efforts of gender mainstreaming in education through initiatives such as gender-responsive education toolkits that are being implemented in Ethiopia and Ghana by UNESCO to improve adolescent girls' overall educational attainment, access, participation, and achievement in upper primary and lower secondary schools (UNESCO, 2020). Another initiative is the gender-

¹ [Agenda 2063](#) is a shared framework for Inclusive growth and sustainable Development for Africa

responsive tool kit by Forum for African Women Educationalists [FAWE] (2018) which has been referenced by in-service teachers in teacher training institutions and schools in Burkina Faso, Chad, Ethiopia, The Gambia, Guinea, Kenya, Malawi, Namibia, Rwanda, Senegal, Tanzania, Uganda, and Zambia.

The Education and Training Sector Gender Policy goal aims to eliminate gender inequalities through the provision of quality education and training (Republic of Kenya, 2015). The three policy objectives for this goal include i) institutionalizing a gender-responsive quality curriculum in the sector strategies; ii) institutionalizing a gender-responsive and inclusive quality curriculum for teacher education and development strategies, and iii) mainstreaming gender in teacher education and development strategies. Our study is aligned with this policy and seeks to shed light on gender mainstreaming in basic education in Kenya. The findings of the study will provide pedagogical and policy recommendations on gender mainstreaming in the basic education and teacher training curriculum.

3. Literature Review

Research reports indicate that Kenya has attained national gender parity in enrollment at the primary school level. However, there are persistent regional disparities across the country due to challenges of access, retention, completion, performance, and transition. It is noted that the gender gap widens as learners advance in the academic ladder, particularly for access and academic achievements in Science, Technology, Engineering, and Mathematics (STEM) (Ministry of Education Science and Technology, [MoEST], Kenya, 2015). A scan of the available literature shows that evaluation of the implementation of the gender mainstreaming policy has mainly focused on the representation of women in various institutions and less on whether and how the mainstreaming is being implemented in the classroom settings (Kaimenyi et al., 2013; Republic of Kenya, 2016). In most cases, these studies highlight implementation hiccups as a major challenge. Gender mainstreaming encompasses the consistent and systematic integration of gender equality issues into the development and implementation of policies, plans, programs, and projects at all levels, including national, community, school, and classroom (Forum for African Women Educationalist [FAWE], 2018). The ultimate goal of mainstreaming is to achieve gender equality and equity.

According to Omukhulu et.al (2016) only about 71% of Technical and Vocational Education and Training (TVET) officials in charge of gender mainstreaming activities in their institutions agreed that the policy was being implemented as intended, especially in providing bursaries to female students joining STEM-related courses. Further evaluation revealed that despite a 43% increase in enrollment rates from 2009 to 2011, the gender parity index had reduced from 0.957 in 2009 to 0.804 in 2011. Further, the study showed that course choices were still heavily dependent on gender with more males enrolled in engineering and related courses and more female students in business-related courses.

The lack of involving policy users in the development, review, and evaluation of the gender mainstreaming policies is also highlighted as a challenge to the successful implementation of the same (Ochieng, 2014). For instance, the study found that 70% of respondents in higher education institutions were unsure of whether the gender mainstreaming policy had been implemented fully or not. Similarly, **Combat (2014) showed that despite there being more female teachers in municipal primary schools in Kenya, they tend to hold fewer administrative positions, with the main barriers being a lack of role models and mentors, male-centered attitudes about leadership, family responsibilities, gender socialization, the influence of patriarchy and belief in meritocracy.**

There is limited research evidence from Kenya on the guidelines for implementing gender-responsive and sensitive curricular, pre-service and in-service teacher training as part of efforts to promote gender equity and equality in education. Findings of the study by FAWE (2009) indicated that teachers who utilized the gender-responsive tools and strategies in their teaching felt empowered and demonstrated more control in their instructional strategies as well as their ability to create a more open and safe learning environment for their students. Furthermore, the Child-Friendly School concept implemented by the government in partnership with UNICEF supports the use of inclusive strategies to cater to the learning needs of every child and address their vulnerabilities. Research further denotes that beyond the personal transformation, teachers noted that the use of gender-responsive practices resulted in improved academic outcomes for girls, change in student behaviors and attitudes, greater participation of girls in the classroom processes, school committees and leadership roles, higher gender awareness among boys (Bever, 2014). While Kenya has made significant progress towards gender equality, there remain institutional, structural, and cultural barriers to the participation of women in higher levels of education, entering the workforce, and attaining high-level management or decision-making roles (Frosina & Mwaura, 2016). Gender-based violence in form of rape, assault, defilement, sexual harassment, emotional abuse, and female genital mutilation disproportionately affects women and is a major public health and human rights crisis in Kenya. The government has instituted policies - Sexual Offences Act 2006, Protection against Domestic Violence Bill 2015, Family Protection Bill 2001 - that target eliminating GBV and has made GBV a criminal offense. Sexual harassment of girls is also prevalent in schools settings with perpetrators being male teachers and students and impacts girls' attendance and participation in the learning activities effectively (Elimu Yetu Coalition, 2003).

In addition, the Kenya Institute of Curriculum Development (KICD) has attempted to address gender issues through curriculum development and curriculum support materials. Despite these efforts, there are persistent challenges that call for attention in the Education and Training Sector Gender Policy in the education sector to address pedagogy, teaching/learning processes, and the entire student-teacher interaction in schools. Current practices typically reflect gender biases, stereotypes, and insensitivity. The learning outcomes of boys and girls are influenced by the hidden curriculum presented through the school practices, behaviors of teachers and students, and the school community which influences a student's worldview and decision making (Kiptoo-Tarus,

2016). Evidence from various studies conducted in Kenyan primary and secondary schools reported that teachers pay more attention to boys than girls do which accounts for the individual differences in learning outcomes (Skelton et al., 2007; Ngware et al., 2012). According to Skelton et al (2007), teachers have different behavioral expectations for boys and girls within the schools. On the one hand, girls are expected to be appreciative, calm, conscientious, cooperative, mannerly, and dependable. While on the other hand, boys are expected to be active, adventurous, aggressive, assertive, curious, energetic, inventive, enterprising, and independent. These behavioral expectations may inhibit student engagement in the learning process.

Kiptoo-Taurus (2016) examined the effect of gender mainstreaming in secondary education on the psychological adjustment and career aspirations of girls in four counties (Turkana, Narok, West Pokot, and Elgeyo Marakwet) in Kenya. The study also examined the extent of implementation of the gender mainstreaming policy in girls-only schools in select counties in Kenya. The findings revealed that the head teachers had a significantly high level of awareness of gender mainstreaming in education. Students' level of awareness of gender mainstreaming in education was moderate and their knowledge low. The head teachers noted that the gender policy documents/manuals were circulated by the Ministry of Education to all schools in the counties and headteachers were mandated to oversee the implementation of the policy. However, the headteachers acknowledged that they did not receive professional development training or sensitization on gender mainstreaming. Additionally, the findings indicated that gender mainstreaming was positively correlated with the girl's psychological adjustment and career aspirations. In another study, Forssman and Jacobsson (2016), examined the implementation of gender mainstreaming strategic plans in secondary education in Kisumu County through a qualitative field study. The gender mainstreaming strategic plan sought to reduce disparities in enrollment and retention of boys and girls in school and to promote increased access of women and men to life management education. The findings of this study indicated that in Kisumu county secondary schools, the implementation of the gender mainstreaming strategic plan was lacking. Moreover, teachers were unaware of the details of the plan. Notably, there was high inequality between boys and girls in Kisumu County, which was attributable to high levels of poverty. Lastly, family factors, including household responsibilities, affected girls more than boys. Several people including parents, career advisors, and teachers influenced the choice of subjects among these students. Even though career advice was generally provided to all students, the career aspirations of girls were not well guided. The available research evidence shows that there are gaps in knowledge on the extent of implementation of the gender mainstreaming policy and practices in the basic education setting. This thus calls for multifaceted approaches that not only include gender-responsive policies but also community engagement to change retrogressive gender norms.

It is worth noting that teacher shortage is a big challenge across Kenya's public schools and more so in marginalized and hardship communities due to deployment imbalances, insecurity concerns in certain regions, and teacher preferences (Abdi, 2019; Odhiambo et al., 2015; Scott-Villiers et al., 2015; TSC 2019; Uwezo, 211). More recent TSC data projected

a teacher shortage of 97 214 in 2022 and 96, 612 in 2023 for primary and secondary schools (The Teacher Service Commission [TSC], 2015). Consequently, coverage of curriculum content is not adequate and contributes to low academic achievement. Some of the coping strategies that schools employ to mitigate the trained teacher shortage include recruiting trained and untrained temporary teachers under the board of management, existing teachers taking teaching overloads, merging classes per grade, or congesting classrooms (Joyce et al., 2014; Kasau, 2012; Ruto et al., 2010). To illustrate, Abdi (2019) reported that in Garrisa, Mandera, and Wajir, there is a heavy reliance on teachers from other country regions because of a high shortage of teachers from the area. This then presents the challenge of the high turnover of teachers, which negatively influences student-learning outcomes. Therefore, these dynamics of class sizes, teacher shortage, and teacher training may affect how gender issues are mainstreamed in the classrooms in primary education. In addition to this, the distribution of gender of teachers may influence gender-mainstreaming practices. For instance, research reports a high ratio of female teachers in urban areas vs rural areas (Ministry of Education Science and Technology, 2000). Moreover, female teachers predominantly teach the lower primary classrooms. The present study will capture these dynamics and will ensure to get data from both male and female teachers to ensure that the data is representative and can be generalizable to issues of gender mainstreaming by both male and female teachers.

This research aligns with fundamental principles of the Gender Integration Continuum (GIC) theoretical work and allows for the categorization of how the policies and practices treat gender norms and equality in their design and implementation (IGWG, 2017). Specifically, GIC focuses on gender ‘blind’ – implying that the teacher training policies and practices ignore gender norms; and gender ‘aware’ – implying that the policies and practices deliberately address both unforeseen and anticipated gender-related effects because of implementation. The gender aware dimension will further be categorized into transformative, accommodating, or exploitative.

4. Objectives of the Study

General objective

The overall objective of this study is to provide policy-relevant evidence for action on how well gender issues are mainstreamed during curriculum implementation in basic education in Kenya.

Specific objectives

The specific objectives will be to:

1. Examine how the teacher-training curriculum is preparing teachers to implement gender-mainstreaming strategies (such as actual training skills and processes) within the basic education sector policies and guidelines.

2. Examine how gender mainstreaming is practiced inside the classroom during the teaching and learning process.
3. Assess the relationship between effective pedagogical practices that mainstream gender issues and students' school attendance, choice of subjects, and academic performance.
4. Explore the extent to which key school programs and strategies put in place by the government and/or private sector promote gender equity in basic education.

5. Research Questions

This study seeks to answer the following questions:

1. How does the teacher-training curriculum in Kenya respond to the basic education sector gender policies with regard to gender mainstreaming in teaching and learning?
2. Does the gender policy in education (as viewed from the lens of teacher pedagogical strategies and practices inside the classroom) enhance gender mainstreaming, and how do the observed strategies relate to students' (boys/girls) school attendance, choice/preferred subjects, and academic performance?
3. What strategies (policies, practices, guidelines, decrees, curriculum) have been put in place by both government and/or private sector to mainstream gender issues in the curriculum, and to what extent do such strategies interact with the ecosystem (political, social, and economic systems within the context in which they are implemented) to promote gender mainstreaming in basic education?

6. Conceptual Framework

Converging evidence indicates that for gender access, equity, and equality to be attained fully and to break the systemic barriers and challenges that women continually face, government systems need to make concerted efforts to address pre-existing challenges, and find solutions to overcome these challenges, and establish mechanisms for breaking barriers. Gender mainstreaming practices in basic education settings are directly correlated with several factors including, students' school attendance, choice of subjects, and academic performance. In addition, it is reflected in the gender representativeness of the leadership in the education settings (leadership in the classrooms, administration - teaching and non-teaching staff); stakeholders' competence or knowledge in gender mainstreaming; availability and implementation of policies, practices, guidelines, decrees, curriculum to support gender mainstreaming in education. Curriculum, teaching, and learning practices play a critical role in influencing the learning process. The education sector particularly needs to equip pre-service and in-service teachers with knowledge of the content on pedagogy and gender mainstreaming practices. More so, teachers ought to promote access, equity, and equality through inclusive pedagogical practices, for instance in social interactions with students. This could be through teacher evaluation tools that assess classroom quality through teacher-student interactions. The Gender Integration Continuum (GIC) framework will guide data analysis. This will allow us to examine how policies and practices treat gender norms and equality in their design and implementation (IGWG, 2017). In particular, GIC will help us use a framework that focuses on gender 'blind' – implying that the teacher training policies and practices ignore gender norms;

and gender ‘aware’ – implying that the policies and practices deliberately address both unforeseen and anticipated gender-related effects because of implementation.

In addition to this, schools and surrounding communities need sensitization and awareness of intentional programs and practices that enhance gender mainstreaming. These programs need to be examined and vetted periodically to ensure that they attain the desired outcomes. Lastly, it is important to have collective support through initiatives, policies, and programs that seek to mainstream gender through curriculum design and implementation. Gender mainstreaming practices and teacher training are highly interconnected as the quality of teacher training influences teaching practices hence it indirectly influences learning outcomes. Similarly, effective school, government, and private sector gender mainstreaming contribute to student learning outcomes.

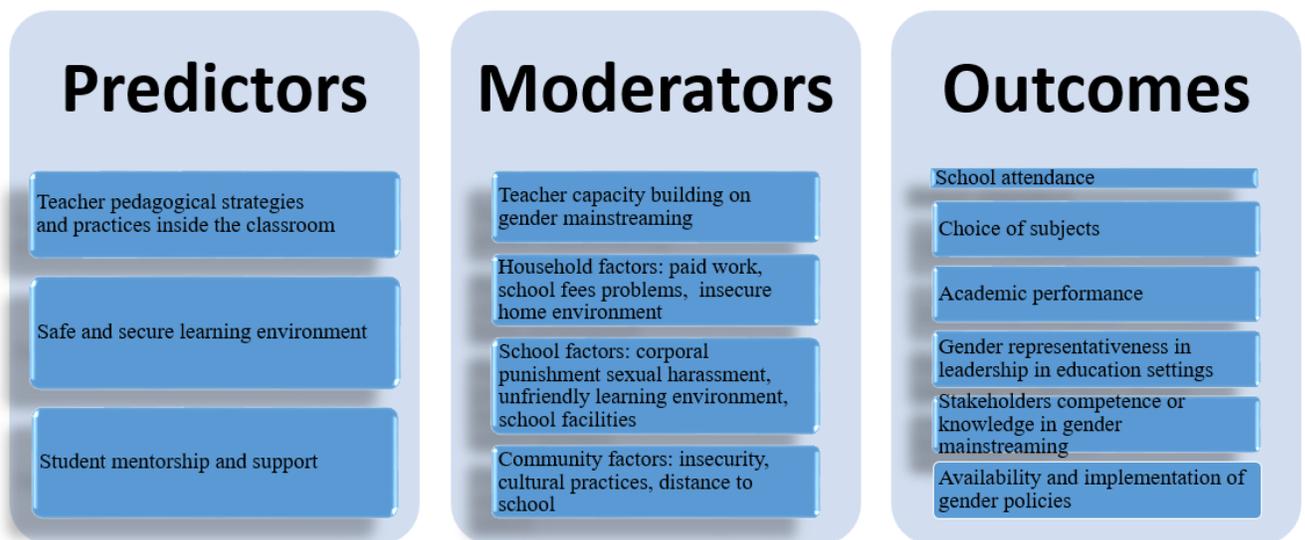


Figure 1: Conceptual Framework for Gender Mainstreaming in Basic Education

Predictors/Independent variables assess the strength and direction of their association with an outcome, criterion, or dependent variable. In the present study predictors such as teacher pedagogical practices, a safe and secure learning environment may be used to estimate the outcome variables that include student learning outcomes, school attendance, and choice of subjects, stakeholder’s competence or knowledge in gender mainstreaming. On the other hand, moderators are the variables that affect the relationship between a dependent and independent variable.

7. Methods

The present study will utilize a mixed-methods approach structured as a sequential exploratory. We will explore the relationships between observed measures such as gender-equitable pedagogical approaches, teacher-student interactions during lessons time, and gender equity measures in basic education settings and students’ school attendance, academic outcomes, and choice of subjects. The sequential exploratory approach will provide an opportunity to collect

qualitative data that will inform the quantitative data, and allow descriptive and inferential analyses to be done in a more meaningful way.

7.1 Sampling Procedures and Participants

Primary data will be collected from students in pre-primary, primary, and secondary schools (mixed gender day schools) (primary grade 6, and secondary form), in-service teachers, headteachers and principals, pre-service teachers, teacher training tutors/lecturers, county/national education curriculum support officers, and quality assurance officers, and officials at the Ministry of Education and the Teacher Service Commission. We will target 250² schools (125 primary and 125 secondary) spread in 10 counties in Kenya with the highest rates of child poverty - above 60% (KNBS, 2018). The counties include (Busia, Garissa, Mandera, Marsabit, Tana River, Turkana, Samburu, Wajir, Nairobi, and West Pokot). We chose these counties because children, girls in particular girls in these areas, encounter some form of marginalization, due to child poverty levels. Additionally, vulnerable boys and girls have diminished chances of access to inclusive education because they belong to schools that serve poor households in a low-resource context. Hence may require targeted actions in mainstreaming gender issues in education.

Our overall sampling strategy takes into consideration school performance in the most recent national examinations - the Kenya Certificate for Primary Education (KCPE) for primary schools and Kenya Certificate for Secondary Education (KCSE) for secondary schools. In particular, we shall group schools into three categories based on their performance - low, medium, and high performing. In each of the 10 counties, primary, and secondary schools will be listed according to the league tables (best performing to worst performer). Thereafter, we shall create quintiles with schools falling in the lower two (40%) quintiles constituting low performing schools; those in the 3rd quintile forming the middle performing schools; while those in the upper two quintiles (top 40%) forming the best performing category. A similar procedure will be followed to identify day secondary schools - day secondary schools admit the majority of students and are located in almost all parts of the country/county). Once our sample size is identified, it will be proportionately distributed in the three groupings taking the number of schools in a county into consideration.

Out of the 250 schools sampled for the study, 125 schools will be sampled for classroom observations, that is, 62 primary and 63 secondary schools. At the primary school level, 21 observations in mathematics, 21 in science, and 20 in English will be made. An equal distribution of 21 observations for mathematics, English, and science will be made for secondary schools. **We will observe a total of 147 teachers.** A further random selection will be employed to distribute the science classroom observations at the secondary school level, translating to 7 observations each for physics, chemistry, and biology. An illustration of the classroom observation distribution is provided below. The grade to be observed in a subject will be randomly selected, such that we

² This is based on optimal design software using the following assumptions: alpha=0.05, an effect size of=0.40 and, a cluster reliability = 0.8. Based on this we need 180, but considering the need for adequate sub-analyses and possible incomplete data that may arise due to schools being in hardship areas, and rural-urban differences we round off to 250 schools.

shall have only one subject observed per school. In the case of secondary school where there are several science subjects, we will focus on physics, biology, and chemistry. The subject to be observed in a particular school will be randomly selected. Once a subject has been observed in a selected school, it cannot be observed in a subsequently selected school until all the other subjects in question have been observed. It is worth noting that in Kenya, traditionally, girls perform better in English while boys perform better in Math). KNEC assessment data will be collected from the school head teacher/principal for each of the observed grades. All head teachers and principals of selected schools will respond to an institutional questionnaire. The questionnaire will collect information on the school background, facilities, enrollment, schooling charges, staffing, and governance. **Twenty (20) students from all selected schools and from the targeted grade (except in PP2) will complete a student questionnaire that gathers information on individual student's background, homework engagement, school background, and subject choices.**

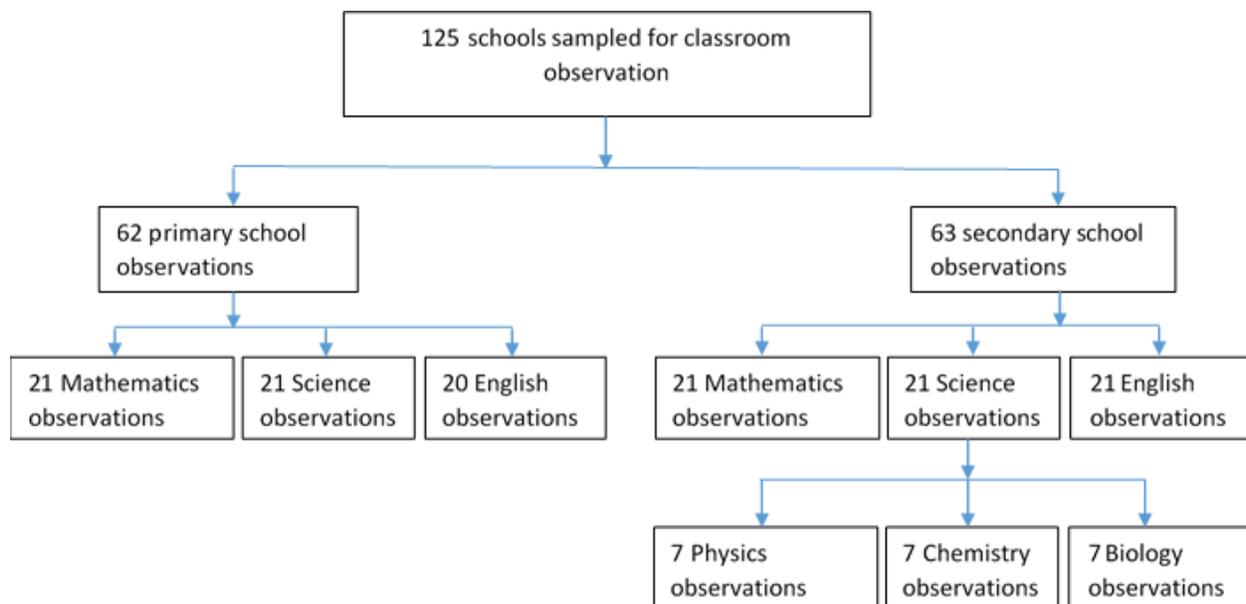


Figure 2: Tabulation of classroom observations

We will conduct qualitative interviews that will shed light on how the teacher-training curriculum responds to gender mainstreaming policies, gender-inclusive teaching practices inside the classroom, and strategies implemented by the Government and private sector to mainstream and promote gender issues in the curriculum. The KIIs will target a total of **40** in-service teachers - 4 teachers in each county - categorized by type of school (public, private, day, boarding, primary, secondary, single/mixed gender; 6 pre-service tutors from 4 teacher training colleges (TTCs) and 2 Universities; **10 curriculum support officers and 10 quality assurance officers** from each county; 2 officials from the Ministry of Education (Directorate for basic education and gender officer); and 1 official from the Teacher Service Commission (in-charge of teacher training). In addition, we will conduct 6 FGDs with pre-service teachers from 4 TTCs and 2 Universities. **10** FGDs will also be conducted with students - one in each county; five in primary schools (3 with girls and 2

with boys), and five in secondary schools (3 with boys and 2 with girls). Each FGD will be held with 6 participants. The KII guides and FGD guides will be pilot tested and revised accordingly to ensure the reliability and clarity of the tools. The KII and FGD guides will be sent to the selected respondents before the interviews for familiarity purposes and adequate preparation for the actual interviews. The KIIs will last a duration of up to 1 hour whereas the FGDs up to 2 hours.

7.2 Analytical procedures for estimating the effects of gender policy in basic education

We will compute a gender policy compliance score for each school in the sample based on the indicators highlighted in Box 1. The compliance level will be categorized as high, medium, and low since the schools in the middle can move in either direction, using only the high compliance category as the treated group, and the low compliance as the comparison group (untreated). This will mimic a posttest comparison group design. The objective of the evaluation will be to establish the effect size of the treatment for policy compliance. We will run a regression equation to establish the effect of the policy compliance on attendance, subject choice (proportion of students/girls that choose or will choose biology, chemistry, or physics; in case of primary school use proportion of girls that score above a cut-off in science), school means score for the grade in last KNEC-based examination, rating on best-gender practices inside the classroom, and rating on gender-friendly school for the treatment and comparison groups. The regression equation will adjust for the key covariates that could also drive the outcome measures, e.g. county, type of school (private/public, mixed/single-sex) year of establishment, school size, gender of head teacher/principal, level of equipment of science laboratory, etc. One limitation of this exploratory study is that the sample is not scientifically generated but is rather based on logistics, cost, and overall design considerations.

Specification of regression framework for estimating the effects of the gender mainstreaming policy in basic education

A multivariate analytical approach will be adopted by fitting a regression model of the form (Tarling, 2009):

$$Y_{(i,j)} = \alpha + \beta_1 treatment_{(j)} + \beta_2 X(j) + \varepsilon_{(i,j)} \dots\dots\dots Eq1$$

Eq1 takes into account the ‘treatment’ group and the comparison group after the implementation of the gender policy, where $Y_{(i,j)}$ denotes the value of the outcome variable in school i in group j (treatment or comparison); α , β_1 and β_2 are fixed parameters to be estimated; $treatment_{(j)}$ is a binary variable taking the value of 1 if the school belongs to the treatment group and 0 if the school belongs to the comparison group. In this equation, we introduce a vector of variables/covariates, $X(j)$, and associated with specific exposures that could influence the outcome of interest. The β_2 is an adjustment estimate, i.e. the average effect of exposure to the covariate; and, ε is the random error term.

7.3 Data Collection Procedures

Our methods and analysis will follow mixed-methods structured as a sequential exploratory, utilizing both qualitative and quantitative primary data that will be collected at the school level, as well as among education managers at both county and national education offices. We will complement primary data with secondary data from the MoE EMIS system.

For the first research question, we will conduct a document analysis of the pre-service teacher training curriculum materials including curriculum, syllabus, course outlines, training modules, gender frameworks, and assessments materials. Results from this exercise will shed light on whether and how the teacher-training curriculum in Kenya responds to the basic education sector gender policies with regard to gender mainstreaming in teaching and learning. In addition, classroom observations will be conducted within the 6 teacher training colleges and universities to assess whether and how gender and inclusion equitable practices are imparted to teacher trainees and practiced by tutors within the lecture halls. Qualitative interviews with pre-service teachers and tutors, in-service teachers, curriculum support, and quality assurance officers will also be utilized to provide more information on their gender mainstreaming practices in teacher training institutions, lessons learned, challenges, and opportunities for mainstreaming gender issues in teacher training. Further, a knowledge assessment survey will be administered to the teacher training tutors and pre-service trainees to assess their knowledge of gender mainstreaming. The assessment instrument will be a 5 point Likert scale ranging from 1=Strongly Disagree, 2=Disagree, 3=Undecided, 4=Agree, and 5=Strongly Agree.

The second research question seeks to examine whether pedagogical strategies and practices used in classrooms by teachers enhance gender mainstreaming and how this influences students' (boys/girls) school attendance, choice/preferred subjects, and academic performance. We will conduct classroom observations in middle primary grade 6 and lower secondary form 2). The class sessions will be video recorded. The classroom observation rubric is based on rubrics from previous tools used by APHRC, CGD, MoE, Gender mainstreaming toolkits i.e. (Gender Responsive Pedagogy: A Toolkit for Teachers and Schools (FAWE), Gender Mainstreaming Toolkit for Teachers and Teacher Educators - Commonwealth of Learning, Gender Mainstreaming Toolkit for Teachers and Teacher Educators) and other validated instruments. The items on the classroom observation protocol are grouped into four main categories gender-responsive lesson planning, language use, teaching and learning materials, gender-equitable practices, and classroom setup and environment. They will include items on teacher-student (boy/girl) interactions, the nature of questions asked to various students and feedback provided by classroom management, and how gender issues are dealt with during instruction. The protocol will also attempt to capture teacher biases, different expectations for boys/girls, assignments/learning tasks, elements of stereotyping, and reflection of norms during instructions. We will focus the observation on three subjects – math, one science subject (or science from primary), and one language subject (English/Kiswahili).

Video classroom observation will provide an opportunity to zero in on specific student and teacher behavior that the research team could watch carefully and deeply over time for deeper analyses. The timeline analysis of the video recording will help us isolate teacher and student behaviors as a lesson progresses. The observations will be complemented by data collected using a class observation checklist to contextualize the classroom setting. Data collected will include the number of students present and absent during the observation, gender of the teacher, pre-lesson preparation - from the lesson plans and schemes of work, available classroom resources, classroom environment, and sitting arrangement. Additional data will also be collected from students in the sampled classes including general background information, household socioeconomic status, homework support, motivation to undertake optional subjects in secondary school, school attendance, and school environment. Student academic performance data will be accessed from the most recent KNEC assessment scores in the schools as well as the assessment records provided by the school. We are aware that this may not apply to all grades and hence linking pedagogical practices to student performance will be limited to the assessment scores that will be provided by the schools. To answer the third research question, we will use a systematic approach that will include a desk review to identify, synthesize, and analyze gender-related policies and practices at national, school, and classroom levels. Additionally, we will extract information from strategic plans and policy documents from the Ministry of Education, Semi-Autonomous Government Agencies such as the TSC and KICD, research institutions, and CSOs that support the implementation of the basic education curriculum. In the synthesis and analysis, we will examine how various policies and practices are related to the mainstreaming of gender issues in the teacher-training curriculum for basic education. The review will address how past and emerging policies and practices in teacher training programs ensure teacher trainees are equipped with the knowledge and skills required to integrate gender issues during instruction. The qualitative study will also provide key insights on the implementation of the policies and practices, as well as any glaring gaps and emerging issues.

In this question, we will rate the schools' compliance with the Ministry of Education gender policy. A compliance score will be generated using information gathered from student and institutional questionnaires. The rating will be based on the 6 focus areas highlighted in Box 1 below, of the education sector gender policy. For instance, when checking the school's compliance on reducing gender inequalities in access, the score will be computed based on items on enrollment of students and attendance records. For compliance in supporting equal participation of men/boys and women/girls in decision-making, we shall generate a score based on items such as the number of students, teachers, and schooling staff by gender that are in leadership and decision making positions e.g heads of departments, student councils, etc. Under each focus area, we will develop at least two to three items that will be rated on a 1-5 point (Likert-type scale), with 1=low compliance, and 5=high compliance. Each school will have a computed gender compliance score (SGCS).

Box 1: Areas of Focus of the Education Sector Gender Policy

1. Reduce gender inequalities in access, participation, and achievement at all levels of education.
2. Support equal participation of women and men as decision-makers in shaping the educational policies and practices for sustainable development.
3. Increase participation in education for disadvantaged girls and boys, orphans and vulnerable children (OVC), students with special needs,
4. Ensure a gender-responsive implementation;
5. Improve participation in SMT subjects through the provision of mentoring programs to all learners.
6. Ensure a safe and secure learning and work environment that is free of any form of sexual harassment and gender-based violence.

To examine if the compliance enhances gender-sensitive teaching behavior and learning outcomes (the outcomes of interest), we shall collect data that will allow for the adoption of a quasi-experimental approach in the analysis of RQ3. For instance, schools with high compliance will be matched (using a propensity score matching approach) with low compliant schools based on known factors that influence the outcomes of interest. This approach will enable us to mimic an experimental design to establish the impact of the gender policy in schools.

7.4 Study Tools

Researchers at APHRC will spearhead the process of developing the study tools in consultation with the partners from the Center for Global Development (CGD) and the liaison at the Ministry of Education, Kenya. Table 1 provides a detailed description of the type of tools that target respondents and the data to be collected.

Table.1: Description of study tools

Study tool	Target respondents	Data collected
Institutional questionnaire	School heads/administrators	School background information, school facilities, enrolment for the current school year, school charges, staffing, and governance,
Student questionnaires	Students in primary school grade 6 and secondary school form 2	Student background information, social-economic status, homework and homework support, choice of subjects, school environment, absenteeism, and extra tuition.

Classroom observation rubric	<ul style="list-style-type: none"> • Primary and secondary school teachers • Tutors in teacher training colleges (TTCs) 	Gender and inclusion equitable practices in the classroom: language use, lesson planning, teaching and learning materials, asking questions, group work, demonstration or practical lessons, feedback to students, classroom set up and environment
TTC tutor knowledge survey assessment	Tutors in TTCs/University	Level of knowledge of gender mainstreaming practices by tutors (Likert scale)
Teacher trainee knowledge survey assessment	Teacher trainees in TTCs/University	Level of knowledge of gender mainstreaming practices by teacher trainees (Likert scale)
Qualitative guides (Key Informant Interviews)	<ul style="list-style-type: none"> • In-service teachers • Curriculum Support Officers • Quality Assurance Officers • Pre-service tutors (TTCs and Universities) • Ministry of Education – Director of teacher education, Kenya Institute of Curriculum Development, • Teacher Service Commission 	In-depth understanding of gender mainstreaming practices, policy implementation (successes, challenges, and opportunities)
Qualitative guides (Focus Group Discussions)	<ul style="list-style-type: none"> • Pre-service teachers (TTCs and Universities) • Students in primary school • Students in secondary school 	In-depth understanding of gender mainstreaming practices, policy implementation (successes, challenges, and opportunities)

7.5 Hiring and Training of Research Assistants and Interrater Reliability

Field interviewers will be recruited from the 9 counties where the study will be conducted. The field interviewers will undergo rigorous training on the overview of the study, study instruments, qualitative and quantitative data collection procedures, and ethical guidelines. In addition, consultants will be engaged to code the classroom observation videos. The consultants will practice coding several videos together until they achieve high consistency and high interrater reliability. During the training, mock interviews will also be conducted to gauge the research assistants' knowledge of the tools to be used for data collection. During the training, adjustments will be made to the study tools should there be any corrections. During fieldwork, the research team will hold regular meetings with field research assistants to deliberate on issues arising from the field, exchange notes, and share experiences. The lead researchers will also conduct random spot checks to ensure high fidelity of implementation and data quality.

7.6 Data Management

Data for the study will be collected by rigorously trained and experienced researchers and data entry clerks. Data from the KII interviews and focus group discussions will be stored in specifically assigned recorders. Immediately after the interviews and focus group discussions, the data will be transferred to a password-protected computer, which will be only accessible to the selected research team. The transferred data (from recorders to secure computers) will then be transcribed verbatim by transcribers. In the transcripts, any respondent identifying information will be deleted and in its place, pseudo names or anonymizing names will be used instead. All the identifiers from the knowledge survey assessment tool will be removed. The data which will be initially recorded on paper will be anonymized, entered, and stored in password-protected computers. The hard copies of the data will be stored in secure password-protected cabinets accessible only to the research team. Similarly, data from the classroom observation video recordings will be transferred to password-protected computers. All the identifiers will be removed during the coding process. The student learning outcomes will also be anonymized. All the questionnaires administered will be thoroughly examined for validity as well as completeness.

7.7 Data Analysis

For the first research question that examines how the teacher-training curriculum in Kenya responds to the basic education sector policies through gender mainstreaming in teaching and learning at the pre-service institutions, we will conduct a document analysis. The document analysis will include a review of the teacher-training curriculum, course syllabi, gender frameworks, lesson plans, and training modules as well as the assessment frameworks used to gauge the requisite skills acquired and the extent of engendering instructional practices. A synthesis will follow to come up with trends and conclusions that are representative of how teacher professional development mainstream gender issues in their practices. For the KII with tutors and the FGDs with trainees, we will employ a thematic analysis strategy taking both deductive and

inductive approaches. The NVivo software will be used in the management of qualitative data. Specifically, the thematic analysis will be conducted by examining the interviews based on developed interview guidelines (deductive) as well as emerging themes (inductive) to tease out the commonalities and nuances to inform policy and practices. We will utilize descriptive and inferential statistics of the pre-service training classroom observation data and the tutor and trainees' knowledge survey assessments to examine the extent to which gender pedagogical practices are implemented within lecture halls and how knowledgeable about gender mainstreaming.

The second research question examines the associations between gender mainstreaming practices in basic education settings and how they influence school attendance, academic achievement, and choice of subjects. To address this research question, multiple methods and data sources will be triangulated to enhance the reliability and validity of the findings. We will conduct a descriptive analysis of the four domains of gender-equitable practices. To follow this we will conduct a correlation analysis to associate pedagogical strategies to learning achievement, school attendance, and choice of subjects analyses will be disaggregated by boy/girl students. Inferential statistics will be followed by a series of hierarchical linear modeling analyses to examine the extent to which gender-equitable practices influence school attendance, academic achievement, and choice of subjects. This data analysis method was selected because it takes into account the nested structure of data; students nested within classrooms and classrooms nested within schools. The models will also incorporate other variables including student characteristics, school characteristics, age, gender, and SES among others. Additionally, we shall use the qualitative comparative analysis (QCA)³ in the sub-analysis to understand how the perspective of various education stakeholders - including students, in-service teachers, curriculum support staff, and TSC and MOE staff - perspectives on gender-equitable practices in basic education and pedagogical strategies lead to observed outcomes of interest (Legewie, 2013). We will utilize QCA to bridge the qualitative and quantitative data and make a deeper dive into the causal complexity and conditions that influence gender-related outcomes inside the classroom. Gender equality and gender equity inside the classroom can drive student performance, school attendance, and choice of subjects hence the need to understand the dynamics to implement gender-specific interventions (Nishimura, 2017).

The third research question examining the strategies put in place by the government and private sector to mainstream gender in education will utilize qualitative and quantitative. Specifically, we will examine the perceptions and contextual explanations of gender-related practices in schools and classrooms. A thematic analysis will be employed, taking both deductive and inductive approaches. We will also triangulate the different sources and types of evidence and deduce the key shreds of evidence. Using a matching approach to create 'treatment' and 'control' groups in a

³ We will use it to examine and link selected variables to causal conditions expected to contribute to the outcome under study.

quasi-experimental approach, a regression model will be estimated to establish the impact of the education sector gender policy in improving the outcomes of interest.

8. Ethical Considerations

This ethical protocol will first be submitted to the APHRC's Ethics Review Committee for review to ensure it meets the scientific soundness and adherence to ethical principles. Final ethical approval will be obtained from all African Medical and Research Foundation's Ethics and Scientific Review Committee (AMREF-ESRC). We will also obtain a research permit from National Commission for Science Technology and Innovation [NACOSTI]. We will also ensure that all the investigators have completed the - National Institute of Health (NIH) web-based course on protecting human research participants. Furthermore, all the field staff will receive training on research ethics and the APHRC guidelines on working with children. Written informed consent and/or assent will be sought; participation will be voluntary and no coercion will be used. In addition, the risks and benefits of the study will be described to the study participants.

The following considerations will also be taken into account:

Informed consent process: All study participants will be requested to sign a consent form or verbally assent after full disclosure about the purpose of the study, research procedures, benefits, risks, voluntary participation, confidentiality, and redress mechanisms have been communicated by the field staff. Considering that school-going children are study respondents, assent will also be sought for children below 18 years in addition to the school heads consenting for them to participate. Consenting will be done in both English and Swahili to ensure that respondents have an accurate and clear description of the study before agreeing to participate. Respondents will also be left with a copy of the consent form for future reference. A verbal assent script will be read to minors. They will be requested to verbally accept or decline participation in the study.

Recruitment of participants: Recruitment of participants will be transparent to ensure equal opportunity for participation. For instance, the sampled schools and classes that fit the inclusion criteria will be randomly sampled for the classroom observation and institutional surveys.

Confidentiality: Interviews will be conducted in private thereby ensuring confidentiality. During the study, the names of participants will be collected but will only be used for tracking and follow-up purposes by the research team. Final data sets including the classroom observations will also be stripped of all personal identifiers.

Voluntary Participation: Participation in the study will be voluntary and even after giving consent; participants will be allowed to decide whether to continue with the study without any risk of victimization.

Potential risks: During the study, we anticipate minimum risk to study participants. However, to minimize the risk of feeling inconvenienced, interviews will be kept brief and conducted at the convenience of the respondents. In addition, all project team members will be trained on research ethics and the protection of human research participants to ensure that they uphold ethical principles.

Potential benefits: There will be no monetary incentives provided to study participants. However, in the long term, it is expected that the evidence from this study will benefit all Kenyan students and teachers through effective policies and decision-making around gender mainstreaming in basic education.

Questions and contacts: Study participants will be given the chance to seek clarifications about the study. To facilitate this, the contacts of the principal investigator, APHRC and AMREF ESRC will be included in the reference copy of the consent form that will be left with each study participant.

9. Study limitations and risks, and mitigation of the risks

As highlighted by Halim, Wahid, and Halim (2018) two study risks are likely to occur from the classroom observation approaches. Firstly, there is a risk of the observer effect where teachers and students may alter their usual behavior, more often in a positive manner, due to the presence of the observer in the classroom. Secondly, the presence of an observer may also result in teacher anxiety and thus the risk of the teacher performing less well than usual. To mitigate against these risks, the observers will introduce themselves earlier to the teachers and students before initiating the classroom observations to reduce anxiety or behavior changes. They will also be assured that there will be no consequences for any teacher or school that is observed and that the data collected will remain anonymous.

10. Plan for communicating findings of the study

The main intended users of the research evidence are the Ministry of Education and relevant institutions such as TSC, KICD, and CSOs who are at the forefront of promoting gender equity. At all stages of the study, key findings and updates of the study will be relayed to the stakeholders through dialogues, validation and dissemination meetings, research report, policy briefs, blogs, tweets, and media engagements. The Ministry of Education and selected institutions will be co-opted to participate in all stages of the study from conceptualization to dissemination. An inception meeting will be convened with all the relevant stakeholders identified to share the study objectives and ensure buy-in. Some of these stakeholders will also be part of the steering committee that will provide advice, and ensure the delivery of the project outputs and the achievement of project outcomes. A strategic policy engagement plan will also be developed to guide the policy engagement process.

11. Policy Implications

Evidence from the study will enable the Ministry of Education, KICD, and the Teachers Service Commission to understand what strategies they can put in place to align the teacher-training curriculum to the aspirations of the gender in education policy.

Policymakers and actors will also be informed on whether the policy enhances gender mainstreaming, what good practices can be cascaded, what gaps exist, and how this influences students' school attendance and academic performance among others. The education planners will also be informed on how best to plan for the capacity building of teachers to ensure gender mainstreaming in teaching and learning.

The study also assesses how effective the strategies, policies, and guidelines are by both Government and private sectors. This is important in informing the Ministry of Education interventions and programs and also in contextualizing these within the social, political, and economic spheres.

12. Management and organization of the study

The project leadership team will consist of the Principal Investigator (PI), Dr. Moses Ngware, who will provide oversight and the intellectual guidance of the project. He will receive institutional support from the Director of Research for the smooth running of the project. The Co-PIs will support the implementation of project activities including tool development, recruitment of field staff, training, quantitative and qualitative data collection, report writing, mobilization of stakeholders, validation, and dissemination of study findings. The Co-PIs include Dr. Rita Perakis, Dr. Brenda Wawire, Nelson Muhia, Catherine Asego, and Zipporah Kawira.

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