



**Gender Stereotyping and Academic Performance in Science Subjects among Female Students in Secondary Schools in Baitambogwe Sub-County, Mayuge District, Uganda**

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**A Dissertation Submitted to the Directorate of Graduate Studies, Research and Innovations in Partial Fulfilment of the Requirements for the Award of the Degree of Master of Educational Leadership and Management of Busitema University**

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## Declaration

I, Catherine Birungi (Reg. no. BU/GS17/EDM1/3), hereby declare that this dissertation is my original work, and to the best of my knowledge, has not been presented, published or submitted for any award in any other institution of learning.

Signature: 


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## Approval

This Dissertation titled “Gender Stereotyping and Academic Performance in Science Subjects among Female Students in Secondary Schools in Baitambogwe Sub-County, Mayuge District, Uganda” was written by Catherine Birungi under our guidance and supervision, and meets the requirements set by Busitema University for the award of Master of Educational Leadership and Management. It has been submitted with our approval as the research supervisors.

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### Supervisor

## **Dedication**

I dedicate this work to my beloved mother Ms. Nabirye Magaret for her boundless love and belief in me, and for all the sacrifices she made towards my education and general wellbeing; to my children Balaba Gilbert, Nambi Immaculate, my siblings' nephews, and nieces for lighting up my world, and giving me a reason to smile.

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## **List of Acronyms**

APFS	Academic Performance Female Students
GS	Gender Stereotyping
DV	Dependent Variable
IV	Independent Variable
SESEMAT	Secondary Science and Mathematics Teachers
NDP	National Development Plan
UNEB	Uganda National Examinations Board
NCDC	National Curriculum Development Centre
STEI	Science, Technology, Engineering and Innovation
STEM	Science, Technology, Engineering and Mathematics
MOES	Ministry of Education and Sports
UNCST	Uganda National Council for Science and Technology
NCHE	National Council of Higher Education
FAWE	Forum for Africa Women Educationalists
SDGs	Sustainable Development Goals

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## Abstract

The Study examined the influence of gender stereotyping (GS) on Academic Performance in science subjects (APFS) among female students' performance in selected secondary schools in Baitambogwe Sub-County, Mayuge District, Uganda. Specifically, the study assessed the level of gender stereotyping; established the level of academic performance; examined the influence of gender stereotyping on academic performance; and established other factors that influence academic performance in science subjects among female students in secondary schools. The study adopted a cross-sectional survey research design with both quantitative and qualitative approaches. The study was done in 3 government-aided and 6 private secondary schools in the sub-county with a population of 2202 students of S3 and 30 science teachers. A sample size of 327 was determined according to Krejcie & Morgan (1970) which included 318 students of senior three and 9 science teachers. The teachers were selected purposively while the students were selected by stratified random sampling. The questionnaires returned were 310 while the interviews administered were nine. The instruments were found valid using a content validity index of 0.846 and 0.875 for GS and APFS respectively and Cronbach Alpha reliability of 0.867 and 0.786 for GS & APFS respectively. Pearson product moment correlation coefficient were first determined for the relationship between GS and APFS at a 0.01 level of significance while the qualitative data from open-ended responses from teachers and students was analyzed thematically. It was found that; 1) GS was moderate ( $M = 3.38, S.D = 10.10$ ) in secondary schools; 2) the APFS was also moderate ( $M = 3.83, S.D$ ); 3) there was a statistically significant regression effect of GS on APFS ( $\beta = -.271, t = -10.304, p < 0.01$ ). The study concluded that; a) the moderate level of GS is an indicator of improved the perception of female students towards academics; b) the moderate level of academic performance implies that females can do better in science subjects when the limiting factors of academic performance are low; c) reducing GS is crucial for improved female students' performance d) school environment, career guidance and family income also influence academic performance of female students. The study recommends that there should be close monitoring of gender-sensitive programmes in school, monitoring of gender policy and parental involvement. Similar studies should be done in other education levels and also in urban areas.

## **Chapter One: Introduction**

### **Chapter Overview**

This chapter focused on the study's background, problem statement, purpose, objectives, research questions, hypothesis, scope, significance, and conceptual framework.

### **Background**

#### ***Historical Background***

Gender stereotyping has a long and complex history that is rooted in cultural, religious, and social systems all over the world. Historically, societies globally have assigned distinct roles to men and women based on biological differences, leading to deeply ingrained gender roles. In ancient civilizations, like Egypt and Greece, women were often confined to domestic roles like cooking, while men were positioned as leaders and decision-makers in public life. These early gender divisions were reinforced by religion, philosophy, and law, shaping societal norms that persisted up to date. By the time of the Industrial Revolution in the 18th and 19th centuries, gender roles became more rigid in the Europe and US. Men were seen as the breadwinners, working in factories and public spheres, while women were relegated to the home, raising children and managing domestic tasks (Hoffman & Hurst, 1990) and this period reinforced the binary view of gender, associating men with strength, rationality, and leadership, and women with nurturing, emotionality, and submission.

The early 20th century saw the rise of feminist movements that began challenging these long-standing gender roles. The suffrage movement, fought for women's right to vote, challenging the stereotype that women were less capable of political thought or leadership. This era marked the beginning of a shift in societal perceptions of gender, although stereotypes remained deeply entrenched in many cultures (Lips, 2001). The second feminist movement in the 1960s and 1970s brought more focus to gender stereotyping in several aspects of life including

education, employment, and media representation. Feminists like Betty Friedan and Simone de Beauvoir argued that stereotypes of women as housewives and caretakers limited their potential and reinforced inequality (Friedan, 1963). Despite progress, these stereotypes persisted, affecting the way both men and women were socialized, viewed, and treated in society.

Today, gender stereotyping continues to influence various aspects of life, but there is growing recognition of its harmful effects. Educational institutions, workplaces, and governments are increasingly adopting policies to promote gender equality while reducing the effects of stereotypes. This includes encouraging girls to pursue careers in traditionally male-dominated fields and challenging harmful stereotypes about masculinity that affect men's mental health and well-being (Correll, 2004). Despite progress, deeply ingrained cultural norms and beliefs about gender still perpetuate inequality in many parts of the world. Efforts to promote gender equality must therefore address not only structural barriers but also the social and cultural forces that sustain gender stereotypes.

Gender stereotyping in Uganda has deep cultural and historical roots. Traditional norms have often dictated that men and boys pursue roles that involve leadership, physical strength, and public decision-making, while women and girls have been viewed as caregivers and homemakers (Bantebya et al, 2014). These stereotypes have extended into Uganda's education system, where boys are often encouraged to pursue science, technology, engineering, and mathematics (STEM) subjects, while girls are frequently directed toward more traditionally "feminine" subjects, such as arts and social sciences (Mirembe & Davies, 2001).

The Ugandan government has made several efforts to address gender stereotyping in education and promote gender equality through various policies and initiatives. The country's commitment to gender equality is enshrined in its Constitution of Uganda of 1995, which guarantees equal opportunities for all citizens, regardless of gender and one of the key policies is

the Gender in Education Policy of 2009 which aims to eliminate gender inequalities in education and also to ensure that both boys and girls have equal access to quality education. It addresses the need to challenge gender stereotypes that hinder girls' academic achievements, particularly in science and technology. The policy calls for gender-responsive teaching methods, curriculum development, and teacher training to counteract the biases that reinforce gender roles in the classroom (Ministry of Education and Sports, 2009).

### ***Contextual Perspective***

Science is a fundamental element of industrial development and serves as a connection between technology and socioeconomic progress, thereby enabling national growth (Bichi et al., 2019; Gonzalez et al., 2020; Oladejo et al., 2011). Thus, it helps in producing higherlevel skills, competencies and promoting innovation at the same time facilitating rapid growth in job opportunities (Akinyemi & Bassey, 2012; Gonzalez et al., 2020). It is widely accepted that science education is crucial for the development of human resource which is essential for utilizing natural resources to drive economic and social development (Akuaku, 2015). Therefore, one can confidently say that no nation can progress without embracing science education. Over the year's studies have revealed that home, school and society play crucial roles in influencing female participation in science and technology. According to Skelton and Francis (2016) there has been great amount of gender bias that placed women in the kitchen and a few who were educated were in lower administrative positions in education sector compared to their male counterparts. Globally, gender stereotyping and female academic performance in science is mainly determined by school administrators, teachers of science, students and parents (Trowbrige et al, 2004).

The number of females in science fields remains low both as students and professionals worldwide as noted by numerous studies, leading to a very wide gender gap. For instance,

Maries et al., (2018) note that only approximately 30% of the students that were offering algebra- focused and calculus-focused introductory physics courses at the university of Pittsburgh in the united States had female students. In Japan, women makeup12.4% of scientists in academia, and are often passed over for senior positions due to their gender, continuing to face marginalization (Eagly and Karau, 2020).

The situation is similar in the African context, where female students remain underrepresented in science-related fields (Bichi et al., 2019; Grace, 2021; Olasehinde & Olatoye, 2014; Pinias & Matswetu, 2013). Bichi et al. (2019) further note that in Nigeria, in the year 2018 only 28% of students passed biology at credit level with about half of the students scoring below average mark out of 100%. Similarly, Pinias and Matswetu (2013) in Zimbabwe highlight that females remain significantly under-represented in science arena despite the various interventions implemented. The findings by and Bichi et al. (2019) show that low levels of participation of girls in science courses is attributed to factors that affect girls. For example, Baker and LeTendre (2017) assert that girls' performance in sciences in Nigera is affected by the fact that they are saddled with lots of domestic chores and often suffer intimidation from boys when they perform well in science classes. Igbo and Onu (2015) assert in their study stereotyping, and a scarcity of female role models are significant issues in science and technology fields.

In Uganda, the problem is more pronounced where the number of students taking Science related subjects and courses among lower and higher educational institutions is too small compared to their counterparts in the humanities (Asiimwe, 2013; Grace, 2021; Nabbuye, 2018; Tizikara et al., 2019). In addition, Nakemeya (2018) identified several factors that she suspects contribute to poor handling of science education, which in turn leads to fear and poor performance among many students in Ugandan school factors such as lack of teacher

motivation, inadequate provision of relevant instructional materials, poor methodologies, teacher indifference, insufficient counseling, and ineffective questioning habits among the students.

This problem persists despite the numerous interventions put in place by government and non-government development partners such as Forum for Africa Women Educationalists (FAWE) and Japan International Cooperation Agency (JICA) (Ampaire et al., 2021). These interventions include affirmative action of 1.5 additional points for girls at university entry, compulsory science policy among others. All these strategies aim to enhance teaching and learning of science subjects with the goal of improving performance in science.

Baitambogwe Sub-County, Mayuge District is not an exception to this issue as reported by Uganda National Examinations Board (UNEB) which shows persistently poor performance trends in the science subjects and mathematics among secondary school female students in the District, a trend that has persisted to the present day (UNEB, 2020). These high cases of poor academic performance of girls exist in form of low grades in external examinations, low female students' attendance, poor skills attained, and low class participations by female students.

### ***Conceptual Perspective***

The main concepts in the study are gender stereotyping and female students' performance in science. In this case, gender stereotyping means the attitudes and perceptions towards roles and occupations females and males are expected to hold as their career aspirations (Makarova et al., 2019). In addition, gender stereotyping is defined as the generalisations that have to do with the characteristics of boys and girls as perceived by society (Igbo et al., 2015). This study defines gender stereotyping as the formation of beliefs about individuals based solely on gender, without taking into account the actual diversity within and among different gender groups (Buchanan, 2021). It includes personality traits, behaviours, roles, attitudes and

skills. Gender stereotyping (GS) is broken into two components; teachers' perspectives about students' participation in science and students' perspectives about science subjects. Lee's (2017) assertion indicates that female students when taught by female teachers, tend to receive grades that are approximately 5%-10% above the standard deviation compared to their grades when taught by male teachers. This suggests that female students perform better in terms of grades under female teachers relative to their performance under male teachers. For example, sometimes females are taken to be inferior in offering science subjects compared to males.

Female students' performance in science: The degree to which a student performs on a science test is reflected in their grades or average scores as summarized in grades or mean scores in an examination (Mulandi, 2021). Similarly, female students' performance in science is defined as a female student's level of accomplishment or interpretation of test results in terms of class participation, attendance levels, obtained grades and skills attained in the science subjects of chemistry, physics, maths and biology as compared to results from another taken at a different point in time or with results from male students in the same examination.

According to Copper (1996), academic performance in science involves evaluating indicators or test results to compare and interpret changes in sample behaviour over time. This study adopts this definition by Fred, (2017) which suggests that academic performance reflects students' achievements in acquiring academic skills or knowledge, particularly in science.

Female science performance (FSP) is broken into class participation which means students' engagement in materials across a modality of the instructions given, grade scores emphasizing the number of points scored in a given test and lastly, attendance implying the concept of a student appearing to study in class.

### ***Theoretical Perspective***

The study was based on the Expectancy-value theory of achievement motivation (Eccles, 1987). The theory posits that choices related to achievements such as persistence, academic performance and other decision factors of individuals are contingent upon factors such as individuals' perceptions of gender roles, cultural norms, and beliefs, individual interpretation of past experiences, teacher's attitudes/ expectations, and parent's expectations, and attitude towards the gender roles (Eccles, 1987; Wigfield, 1994; Wigfield & Eccles, 2000). In this study, Expectancy-value achievement motivation theory connects gender stereotyping, that is teachers' perspectives about students' participation in science subjects and students' perspectives about science subjects with the female students' performance in secondary school science.

Numerous studies illustrate that gender stereotyping influences female students' performance and achievement in science-related fields by impacting their expectancy and value perceptions. According to expectancy-value achievement motivation theory, these stereotypes can lower female students' expectations of success and diminish their perceptions in value of science subjects, thereby affecting their motivation and academic outcomes. (Igbo et al., 2015; Maries et al., 2018; Pinias & Matswetu, 2013; Starr & Simpkins, 2021). The rationale is that gender stereotyping negatively influences of female students' performance in science subjects. The theory is based on the following principle's a) valence which measures the weight placed on an outcome; b) expectancy shows the faith that better efforts will result into good performance, and c) instrumentality: the belief that increased levels of performance will yield the expected outcome..

## **Statement of the Problem**

Promoting the participation of women in equal measure to men in Science, Technology, Engineering, and Mathematics (STEM), and Science, Technology and Innovation (STI) is critical to the global socioeconomic transformation agenda. The government of Uganda and non-government agencies such as FAWE, JICA among others have put in place interventions like building and maintenance of laboratories, supply of science textbooks, and chemicals, and capacity building of science teachers through programmes such as SESEMAT (Asiimwe, 2013). There is a gender in education policy, and gender mainstreaming policy 2015-2019 in place (Nabbuye, 2018). Despite the interventions, the performance of female students in science continues to be poor (UNEB 2020).

However, no specific study has established the academic performance of S3 students in Baitambogwe Sub-County, Mayuge District. Besides no study has linked female students' performance in science to gender stereotyping, particularly in the study area. Yet gender stereotyping affects female performance leading to drops, and absenteeism, among others. Moreover, despite the existence of policies like the Gender and Education Policy, and the National Educational Policy, there are gaps in implementing them. If the situation continues, the females will lag in performance in sciences, there will be no participation of women in the achievement of development goals such as Uganda's Vision 2030 and Sustainable Development Goals; SDG 4 (Quality education for all), and SDG 5 (Gender equality). It is against this background that the study sought to examine the influence of gender stereotyping on the academic performance of female students in science subjects in secondary schools in Baitambogwe Sub-County, Mayuge District-Uganda.

## **Purpose of the Study**

The purpose of the study was to examine the influence of gender stereotyping on the academic performance of female students in science subjects in secondary schools in Baitambogwe Sub-County, Mayuge District, Uganda.

## **Objectives of the Study**

The study was guided by the following specific objectives:

1. To assess the level of gender stereotyping in Secondary Schools in Baitambogwe Sub-County, Mayuge District.
2. To establish the level of academic performance in science subjects among female students in secondary schools in Baitambogwe Sub-County, Mayuge District.
3. To examine the influence of gender stereotyping on academic performance in science subjects among female students in Secondary Schools in Baitambogwe Sub-County, Mayuge District.
4. To establish other factors that influence academic performance in science subjects among female students in secondary schools in Baitambogwe Sub-County, Mayuge District.

## **Research Questions**

The study sought to answer the following research questions;

1. What is the level of gender stereotyping in Secondary Schools of Baitambogwe Sub-County, Mayuge District?
2. What is the level of academic performance in science subjects among female students in Secondary Schools of Baitambogwe Sub-County, Mayuge District?
3. What is the influence of gender stereotyping on the academic performance in science subjects among female students in science in Secondary Schools of Baitambogwe Sub-County, Mayuge District, Uganda?

4. What are the other factors that influence academic performance in science subjects among female students in secondary schools in Baitambogwe Sub-County, Mayuge District?

### **Hypothesis**

The study tested the following hypothesis to achieve objective three:

H<sub>A</sub>: There is a statistically significant regression effect of gender stereotyping on the academic performance of female students in science subjects.

### **Scope of the Study**

#### ***Time Scope***

The time scope of the study was four years from 2019 to 2022. This period was considered because it is when the academic performance of female students was generally poor partly because of the effect of Covid-19. The time frame of the study was 6 months from July to December 2022. This was ample time to enable data collection, analysis and compiling of the dissertation.

#### ***Geographical Scope***

The study was carried out in nine Secondary schools of Baitambogwe Sub-County, Mayuge District which is found in Eastern Uganda and is about 120 km from Kampala Capital Cital. Baitambogwe Sub-County, Mayuge District was selected because of the poor academic performance compared to other sub-counties in the district.

#### ***Content Scope***

The study aimed to examine the influence of gender stereotyping (independent variable) on academic performance (dependent variable) in science subjects among female students in secondary schools in Baitambogwe Sub-County, Mayuge District.

## **Significance of the Study**

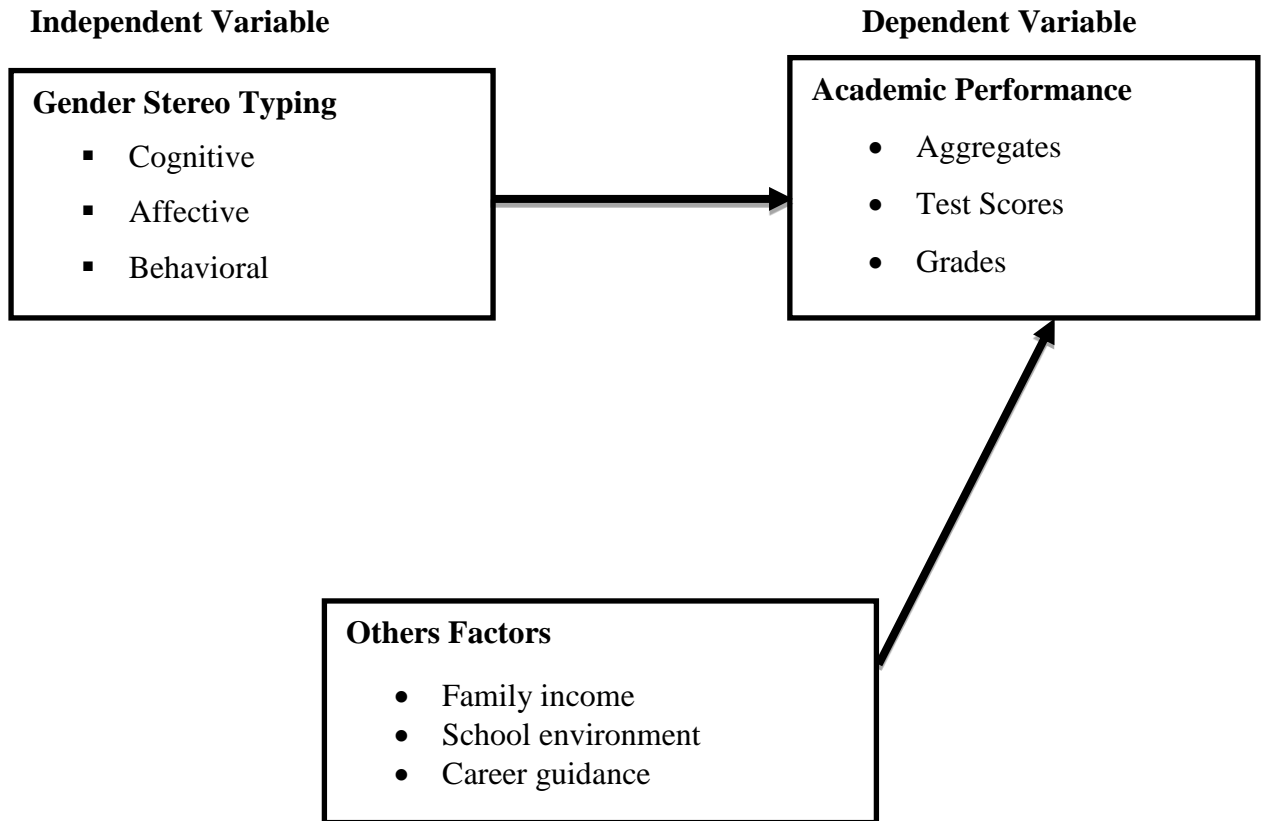
The findings of the study may help the management of secondary schools in redefining effective strategies, mechanisms, and implementation procedures such as mentorship strategies for both students and teachers to overcome gender biases.

The information gathered could also be utilized to alert school administrators, and others in secondary school educational institutions on classroom dynamics, psychology of gender relations, and attitudes in order to provide a balanced friendly learning environment.

The study is hoped to make a significant contribution to different policymakers like the National Council for Higher Education (NCHE), Ministry of Education, and Sports among others to formulate and implement appropriate science teaching policies, and interventions to create gender-responsive pedagogy in order to improve female students' performance in science.

Also, the findings may help other scholars and researchers as reference to generate additional knowledge on numerous perspectives.

## Conceptual Framework



*Figure 1.* Conceptual framework showing the links between the independent, dependent, and ‘other’ extraneous variables.

**Source:** Adopted from Kabira and Masinjila (2009)

Figure 1 presents the influence of Gender Stereotyping (IV) on Female Students’ performance in science subjects (DV). In the frame work, Gender stereotyping is indicated by cognitive, affective and behavioral dimensions. Female students Performance in science subjects is represented by grades, aggregates, and scores. Other factors such as family income, school environment, and career guidance may influence academic performance.

The expectancy value achievement motivation theory emphasises that the female students motivation and behaviour determined by their expectations of success and value put

on achieving a goal will influence their performance in terms of grades, aggregates and scores attained.

## **Chapter Two: Review of Related Literature**

### **Introduction**

The chapter focuses on the theoretical review which underpins the study, the review of concepts and review of literature related to the objectives, and study gaps. in the reviewed studies.

### **Theoretical Review**

The study was anchored on the expectancy-value achievement motivation theory by Eccles (1987). This theory stresses the significance of the relationship between female students' academic choices, decisions, the achievements, persistence, and performance with gender stereotyping that is students', teachers' and parents' beliefs of the roles of female students, interpretation of the past experiences, and psychological factors such as social support. Therefore, Expectancy-value theory helps in broadening the view of academic achievement beyond school environment factors such as career guidance, and effective teaching among others, which target only the learners but also incorporate strategies to minimise gender stereotyping by teachers and parents because it equally impacts the academic achievement of female students.

Several studies agree with this argument that gender stereotyping influences female students' performance in science-related subjects (Alipio, 2020; Fong et al, 2021; Starr & Simpkins, 2021; Steegh et al, 2019). For instance, secondary schools where gender stereotyping was high experienced low levels of female participation rates in mathematics and science competitions more especially in chemistry and physics (Steegh et al., 2019). Previous studies from Alexander (2020), Dunlap, and Barth (2019), and Master, (2021) were anchored on the Balanced Identity theory by Greenwald et al., (2002) which contends that societal gender stereotyping shapes an individual's identity which in turn influences science

related academic achievement by self -assessment of one ability to perform in science subjects. Koul et al., 2016) assert that positive self-assessment of ability in quantitative domains is critical for student participation in science, technology, engineering, and mathematics field studies. However, the theory is limited by its narrow focus on self-assessment of the ability of students about science ignoring the perceptions, and beliefs of teachers, and parents which are also critical in career-related choices.

The expectancy-value motivation theory was selected because it helps teachers, and parents to understand students' motivation and behaviours which further proved to be important in understanding the cognitive process used by the students as well as their performance. In addition, achievements like successful completion of the task, and future aspirations are influenced by perceived expectancies' regarding the outcome, and value of tasks. Therefore, the Expectancy-value motivation theory enabled the researcher to achieve the intended purpose of examining the influence of gender stereotyping (students' and teachers' perspectives) on female students' academic performance in science subjects.

### **Conceptual Review**

This study was on gender stereotyping, and academic performance in science subjects among female students in secondary schools in Baitambogwe Sub-County, Mayuge District, Uganda. Gender stereotyping was conceived as the independent variable while secondary school female students' performance in science was the dependent variable.

*Gender Stereotyping:* There is a lack of consensus regarding the concept of gender stereotyping as various scholars have defined it differently depending on the context of investigation. Mhango and Elias (2014) define gender stereotyping as structured sets of beliefs and perceptions about the personal attributes, behaviours, and roles of a specific social group for example, males are more likely to want to be engineers in comparison to their female

counterparts. In addition, teachers are said to instruct boys and girls to treat success and failure dissimilarly, by encouraging boys to overcome difficulties while allowing female students to give up. According to Igbo et al, (2015) argue that these are generalisations that have to do with the characteristics of boys and girls as perceived by society. For example, some say that females are quieter than males when it comes to calculating numbers in maths.

Accordingly, Knoll et al., (2011) consent that gender stereotypes are those role behaviours, physical characteristics, and occupational status relating to each of the male and female genders in this scenario, men are considered to be physically stronger, and it is assumed that the technical jobs that require physical strength are chosen for males than females. Nseluka (2021) describes gender stereotyping as ideas, perceptions, and beliefs which are developed by the society about males, and females, regarded to be true but are not necessarily true.

These gender stereotypes were classified into students', teachers', and parents' perspectives of gender which can influence the academic performance of students in sciences (Mhango & Elias, 2014; Sekhar & Parameswari, 2020; Starr & Simpkins, 2021; Wigfield & Eccles, 2000). Regarding the above, schools can organise career talks for both the students and parents to influence them to love science.

This study adopts teachers' and students' perceptions of sciences as dimensions of gender stereotyping. Teachers' perceptions about sciences means the teachers' attitude towards the female students' participation in science subjects. According to Sekhar and Parameswar (2020), teachers take the parents' position in the lives of the students at school and are considered to be perfect role models. Therefore, teachers influence classroom experience, choice of subject and academic performance of students. The students' perception of science is the belief about the ability of female students themselves as regards academic performance in science subjects.

*Academic Performance:* Mohammed et al., (2022) define academic performance in science as indicators or interpretation of the sample test result in comparison with a result taken at different points in time or with that from another student or group of students in science for example, teachers measure performance in science using classroom performance, test results, final exam results. The term academic performance was described as the degree to which a student accomplishes science assessments as summarized in grades or mean scores in an examination (Mulandi, 2021). Therefore, based on the above conceptualization, female students' performance in science has been defined as female students' level of accomplishment or interpretation of test results in terms of class participation, attendance levels, obtained grades, and skills attained in the science subjects of chemistry, physics, maths, and biology as compared to results from another taken at a different point in time or with results from male students in the same examination. The indicators of female secondary school students' performance in the above science subjects include class attendance, class participation, skill attainment and scored grade (Debacker & Nelson, 1999). Whereas Narad and Abdullah (2016) defined academic performance in science as the knowledge and skills acquired which is assessed by the marks of a teacher or educational goals set by students and teachers to be achieved over a specific period. For instance, schools usually set strategies or targets that must be achieved in the different science subjects for either a year or a term for learners with teacher's guidance

## **Empirical Review**

### ***Gender Stereotyping in Secondary Schools***

Gender stereotyping in educational institutions is one of the causes of few female students in STEM-related careers (Martino and Pallota, 2016). According to Sekhar, and Parameswari (2020), gender stereotyping is key in shaping female students' perceptions, and

attitudes towards performance in science-related subjects as the teachers, and parents can influence the students' classroom experiences, choice of subjects, and academic achievement. Therefore, the misconceptions of teachers and parents must be dealt with to improve female students' achievement in sciences. All educational institutions should therefore incorporate mechanisms in the daily affairs to boost the academic performance of the female students in science subjects. This can be done through counselling programs for the stakeholders associated with gender stereotyping such as students, parents, and teachers as they are key in influencing performance (Bart et al., 2017).

UENZA (2021) found that male students substantially demonstrated more positive attitudes towards mathematics and a higher level of participation in non-mandatory levels of mathematics than female students. In Uganda, several surveys revealed the imbalance in representation between men and women in science-related fields regarding gender stereotyping (Ampaire et al., 2021; Grace, 2021). In addition, Mackatiani and Mackatiani (2020) indicate that pupil attitudes, socioeconomic status of the family, and culture influence gender disparity as regards the performance of students in science subjects in Kenyan secondary schools. The study encouraged the development of appropriate career guidelines that motivate both girls and boys to pursue science subjects. Findings by Tukahabwa (2022) in Rwanda found that young women were lagging behind their male counterparts in terms of opportunities and access, especially in science-related fields and among the factors discouraging these female students from taking up science subjects in secondary school is gender stereotyping.

Similarly, Mwihi (2020) had earlier indicated a serious academic performance, and achievement gap between the boys, and girls in Nyandarua County, Kenya as a result of gender stereotypes despite various interventions put in place to arrest the inequality situation. The

findings of both Tukahabwa (2022), and Catherine (2020) showed that the level of performance of female students in sciences at the secondary level was influenced by gender stereotyping.

More literature shows that gender stereotyping such as students' beliefs, parents', and teachers' perspectives significantly affect boys' and girls' academic motivation, achievement and performance in science-related subjects (Dinkelmann & Buff, 2016; Sekhar & Parameswari, 2020; Starr & Simpkins, 2021; Thomas & Strunk, 2016). However, this study adopts students', and teachers' perceptions as the dimensions of gender stereotyping.

Gender stereotyping in Ugandan secondary schools was found to be persistent, and continuously influencing science career choice decisions of students despite the numerous interventions by both government and non-government organizations (Ampaire et al., 2021). This was consistent with the earlier findings by Ogawa, and Wokadala (2011) who note the existence of stereotypes against the girl child in secondary schools in eastern Uganda. This led to low female student enrollment in science just being at 20% of the total enrolment only at upper secondary level (Tizikara et al., 2019). To eliminate these misconceptions, among the students, teachers, and parents, school administrators should embrace career guidance programs in the form of class counselling involving subject choices, and other stakeholder counselling into the termly activities to enable learners to make sound career choices (Mudulia et al., 2017).

### ***Academic Performance in science subjects among Female Students in Secondary Schools***

Among the key stakeholders like parents or guardians, teachers and the students themselves have an interest in knowing the academic performance of female students. While at school teachers take the place of parents away from home and have a high influence on the students' performance as students take them to be perfect, and role models (Sekhar & Parameswari, 2020). In this equation, students are the pivot as regards academic achievement

therefore their perceptions regarding science subjects have to be monitored keenly if improved performance in science is to be attained.

Academic performance is a critical measure of student achievement and is influenced by a variety of factors, including socioeconomic status, teaching quality, student engagement, and learning environments. Understanding these dynamics is essential for educators, policymakers, and stakeholders aiming to improve educational outcomes. The following literature highlights significant research findings on the factors affecting academic performance in schools.

Research consistently shows that socioeconomic status is a strong determinant of academic performance. Sirin (2014) conducted a meta-analysis demonstrating that students from higher Socioeconomic Status backgrounds tend to achieve better academic outcomes compared to their lower Socioeconomic Status counterparts. The study highlights the impact of family resources, parental education, and environmental factors on students' learning experiences.

The quality of teachers and the effectiveness of teaching methods play an important role in shaping academic performance. Goldhaber and Brewer (2018) examined the relationship between teacher qualifications and student performance and the results show that that effective teaching methods significantly enhance student learning outcomes. The study underscores the need for ongoing professional development for educators.

Student engagement is another critical factor influencing academic performance. Fredricks, Blumenfeld, and Paris (2016) defined student engagement as a multifaceted construct that includes behavioural, emotional, and cognitive dimensions. Their study showed that higher levels of engagement are associated with improved academic outcomes, emphasizing the importance of fostering a supportive school environment.

The level of parental involvement in a child's education is a major determinant of academic success. Hill and Tyson (2016) reviewed studies on parental involvement and indicated

that high parental engagement positively influences their children's academic performance by fostering a supportive home environment and encouraging educational aspirations.

The school environment, including factors such as school climate and resources, significantly impacts academic performance. Thapa, Cohen, Guffey, and Higgins-D'Alessandro (2015) explored how positive school climates promote student achievement, highlighting the importance of safety, relationships, and teaching practices that foster a sense of belonging.

Research continuously indicates that several initiatives have been put in place to encourage female students to perform better in science subjects to increase the number of females pursuing science-related courses ( Ampaire et al., 2021; Kim & Alghamdi, 2019; Nabbuye, 2018). These interventions included; gender mainstreaming policies, professional development of teachers, affirmative action for female access to university, and career guidance among others. Despite the above-mentioned initiatives, females are not fairly represented in the science related fields (Lubaale, 2021; Mbanjo & Nolan, 2017; Nabbuye, 2018; Nakayiwa et al., 2020; Tizikara et al., 2019). Bichi et al (2019) in a Nigerian context indicate persistent low levels of academic achievement in biology at the secondary level.

The continuous decline in students passing at the credit level was noted and drew attention among major stakeholders in the education sector. A study conducted by Fong et al., (2021) revealed that learners' interest, achievement, choices, persistence, and performance in STEM-related fields were a function of both the students' perceived value and expectations about the content. This meant that students' perception towards sciences in secondary schools is one of the influences on students' performance in science subjects. Therefore, teachers, school administrators, and parents should identify the negative perceptions among the students to deal with them appropriately if performance in science subjects is to be improved.

Conclusively in many schools, teachers, and students determine the female students' performance in sciences because of the contact time between the two parties. This therefore implies that if the gender biases, prejudice, and misconceptions regarding sciences among teachers and students are addressed then possibly female students' performance in science may improve in secondary schools (Mhango & Elias, 2014). The literature also indicates that academic performance in schools is influenced by a complex interplay of factors, including socioeconomic status, teacher quality, student engagement, parental involvement, and school environment. Addressing these factors through targeted interventions can lead to a high level of educational outcomes and a more equitable educational system.

### ***Gender Stereotyping and Academic Performance***

The available literature in the education profession indicates that gender stereotyping predicts female students' academic performance in science-related subjects (Igbo et al., 2015; Nabunya et al., 2021; Starr & Simpkins, 2021). The rationale is that reducing gender stereotyping increases female students' class participation, and development of skills in science subjects (Nabbuye, 2018). This poor performance in science-related subjects was caused by gender stereotyping (Ampaire et al., 2021; Rosenzweig et al., 2019). This is in agreement with Gonzalez et al. (2020) who acknowledged that the under-representation of females in the STEM fields is due to the prevalence of gender stereotyping.

In addition, literature demonstrates that gender stereotyping persists, and continues to influence the career choices, and decisions of students globally (Ampaire et al., 2021). Therefore, it was highlighted as a potential barrier to female students' performance in sciences limiting their opportunities in the science-related fields (Hausmann, 2014). According to Brodish & Devine, (2018), female students withdraw from choosing science and mathematics due to their fear of risks and their lack of confidence in their academic abilities. The differences

in university courses majored in between male students and female students were majorly influenced by the differences in tastes and attitudes between male students and females (Cyencek et al, 2021).

Gender stereotypes in society determine women's career choices and indeed influence employers' attitudes towards employing women (Lubaale, 2021). To attain equal proportions of male and female students, there is a need for change in societal norms, employers' attitudes, and the educational system from gender stereotyping (Lubaale, 2021). This constitutes some of the causes of gender inequalities in science disciplines. Cympian et al (2019), noted that success in sciences might conflict with the gender identity of girls thus misleading them to believe that sciences were all for men, and therefore they lost confidence in pursuing science-related studies.

Gender stereotyping refers to the societal beliefs and expectations regarding the behaviours, characteristics, and roles of males and females. In educational settings, these stereotypes can significantly influence students' academic achievement, self-concept, and career aspirations. Steele and Aronson (2016) found that the threat of stereotypes negatively influences the academic performance of individuals belonging to negatively stereotyped classes. This situation occurs when individuals fear confirming negative stereotypes about their social group, leading to anxiety and decreased performance. Their study emphasizes how stereotype threats can hinder students' ability to perform optimally, particularly in high-stakes testing environments.

A study by Wang and Degol (2017) about gender stereotypes in mathematics and Science explored how gender stereotypes in subjects like mathematics and science can lead to self-fulfilling prophecies that impact academic achievement. The research found that girls who internalize stereotypes about their abilities in these subjects tend to underperform compared to

boys, emphasizing the need for interventions to counteract these stereotypes. Harris (2015) examined the role of peer influence and gender identity in shaping academic performance. The study found that students who adhered to traditional gender roles were more likely to experience negative academic achievement, suggesting that reinforcing gender stereotypes within peer groups can hinder academic achievement.

Buchmann and Diprete (2016) discussed how gender stereotypes shape students' academic trajectories and career aspirations. Their research revealed that societal expectations regarding gender roles can lead to a deviation in academic interests and achievements, ultimately influencing career choices and opportunities for both genders. Rattan and Dweck (2016) investigated how implicit theories of intelligence contribute to the persistence of gender stereotypes in schools. The study findings showed that teachers' perceptions about gender and intelligence can influence their expectations and treatment of students, which in turn affects students' academic performance and motivation.

In conclusion, the literature indicates a strong relationship between gender stereotyping and academic achievement. Stereotype threat, peer influences, and implicit biases contribute to the persistence of gender disparities in educational outcomes. Addressing these stereotypes through targeted interventions is crucial for promoting equitable academic achievement across males and females

### **Other Factors that influence Female students' performance in sciences.**

The performance literature has unveiled other factors besides gender stereotyping that have a profound effect on female students' performance in science. According to Chizimba et al., (2021), the factors that affect female students' performance in science include; the availability of quality teachers, school environment, students' attitudes towards science subjects, parental support and availability of the necessary science-related infrastructure such as

laboratories. The findings are in agreement with Samaila, and Alhassan (2022) who acknowledged the importance of qualified teachers of biology, and supervision of teachers to ensure that they are at school to improve female students' performance in biology.

A study by Yohanna, and Muhammad (2022) on determinants of female students' academic performance found that location and gender significantly affected female students' academic achievement in agricultural science. The low female students' performance was also attributed to other factors such as child early marriages, poverty, and custom beliefs which are a stumbling block to gender equality at the secondary school level as girls are observed to enrol last and drop out first. In addition, factors such as parent's level of education and occupation, domestic workloads, school environment, and distance from home were identified as some of the key parameters that influence female students' academic performance (Osman, 2021). These findings emphasize the need for the involvement of all relevant stakeholders such as the teachers, school administration, and parents to enhance female students' academic performance in science subjects.

Some scholars report of school, and learner-related factors that influence female students' performance in science subjects. Musengimana et al., (2021) found that gender, teaching methods and grade level positively affected students' attitudes towards learning science subjects among secondary school students. Similarly, Kankpi, and Graham (2022) assert that female students' academic performance can be enhanced through students' ambitions, efforts, self-discipline, quality of teaching and learning. The duo added that the encouragement of students by teachers, a friendly learning environment and school culture can greatly influence academic performance in science.

Silva et al., (2018) are of the view that secondary school students' performance in science especially in underdeveloped countries was affected by socio-economic status, parents'

involvement, school resources, and the quality of the teachers. The study stresses the need for key stakeholders such as school administrators, and parents among others to find possible ways of addressing those factors influencing female' academic performance. Having the female students being mentored by women scientists was also found to have a substantial increment in the likelihood of female students enrolling for science related courses in institutions of higher learning (Canaan & Mouganie, 2020). Additionally, Mudulia et al., 2017) noted that provision of career guidance to female students was found to a significant effect on academic performance, and career choices of high school girls. The study further emphasized that the ministry, school administrators should endeavour to incorporate career guidance in form of counseling sessions, group counseling involving subject choices, and filling of joint admission board forms into mainstream curricular to enable learners make sound career choices.

Findings by Quansah et al., (2020) seem to categorize all the fore mentioned factors affecting female students' performance in science into three categories. These are school-related factors, parents' level of education, socio-economic status, learner's self-confidence, career decisions, having a role model in STEM and locus of control. These findings are upheld by Almukhambetova and Kuzhabekova (2020) who found that female students' decision to enrol in science-related courses was determined by factors relating to individual students, school, family, and societal culture.

Finally, Clementina et al., (2020) found that female students' academic achievement and performance in science subjects was a function of factors relating to the key stakeholders of educational institutions such as students, parents, teachers, and the whole community at large. Therefore, all these stakeholders need to be managed appropriately in order to encourage more female students to take science subjects.

## **Gaps in Literature**

The review of related literature has highlighted many studies on gender stereotyping and the academic performance of female students in science subjects. However, many of these studies (such as Gonzalez et al., 2020); Ampaire et al., 2021) have been limited to teachers' perspectives about students' participation in science, and students' perspectives on science subjects. The studies did not reveal the gender stereotypes on the performance of female students in secondary schools. Martino and Pallota, (2016) and Mwihia (2020) indicated that the threat of gender stereotyping is a predicate to students' engagement and choices in their courses and subject combinations while Ampaire et al., (2021); Kim & Alghamdi, (2019) and Nabbuye, (2018) have looked at Patriarchy as a rule of the father which keeps women dominated by men in all spheres of life, including education, occupation and leadership, hence portraying the high gender imbalance. Therefore, since most studies were carried out in Universities and institutions outside Uganda do not show an association between gender stereotyping and academic achievement in secondary schools, there was need for this study to be done in secondary schools.

## **Chapter Three: Methodology**

### **Introduction**

The chapter presents the research design, study population, sample size determination, sampling techniques, instruments for data collection, data quality control, procedure of data collection, data management, data analysis, and presentation, and ethical considerations.

### **Research Design**

The study adopted a cross-sectional survey design with quantitative and qualitative approaches. The cross-sectional survey design was used because it provides a snapshot of the outcome and the characteristics associated with the study at a specific point in time (Quick & Hall, 2015). An approach involving both quantitative, and qualitative methods was chosen as it provides an in-depth understanding of the level of gender stereotyping, female students' performance in science, and the link between the two study variables in secondary schools in Baitambogwe Sub-County, Mayuge District.

### **Study Population**

The study population of 2,232 comprised of 30 teachers of science, and 2,202 ordinary level (S.3) students from 9 secondary schools in Baitambogwe Sub-County, Mayuge District. These respondents were from 9 registered secondary schools both private (6), and government-aided (3) from Baitambogwe Sub-County, Mayuge District (MOES, 2022). Ordinary-level students were chosen because career choices for students are in most cases made at this level (Onile-ere et al., 2021).

### **Determination of Sample Size**

A census of 9 schools was taken in Baitambogwe Sub-County, Mayuge District. This included 3 government schools and 6 private schools and were all selected. The sample size of

327 participants was determined based on Krejcie and Morgan's (1970) sampling table as indicated in Table 1 below.

**Table 1: Sampling technics**

Category	Population	Sample Size	Sampling technique
Teachers	30	09	Purposive
Students	2,202	318	Stratified random sampling
Total	2,232	327	

*Source: Researcher (2022)*

### 3.4 Sampling Techniques

#### Purposive Sampling

A purposive sampling method was used to select 9 teachers of science from the 30 teachers and each school was represented by one science teacher. This was because they had enough information, and experience in teaching sciences and students' performance science.

#### 3.4.2. Stratified Random Sampling

A stratified random sampling method was adopted to select 318 students from 2,202 students because it was necessary to have a fair representation of students' numbers according to the size of the school and gender percentage. Simkus (2022) emphasized that each member has an equal chance to be selected through the use of an unbiased selection method.

### Data Collection Instruments

#### *Self-administered Questionnaire*

A semi-structured questionnaire was used to collect data from the students (See Appendix C). The questionnaire was used because the respondent gets time to ponder upon the questions, and can answer in adequate depth and clarity (Ronald & Rathi, 2022). This questionnaire solicited quantitative data from the respondents consisting of closed-ended items in three sections. That's to say, Section A consisted of the Demographic profile of respondents;

Section **B**: Gender stereotyping comprised **11** items and, Section C: had Academic performance in Science Subjects among Female students' having **7** items being adopted from Ampaire et al., (2021); Brew et al., (2022); Mwangi et al., (2013), and Piatek-jimenez et al., (2018), and from Brew et al., (2022), Forgasz et al., (2004), and, Mhango, and Elias (2014). These were measured on a 5-point Likert scale ranging from strongly disagree, disagree, not sure, agree, and strongly agree. Section **D** of the questionnaire had open-ended questions to generate qualitative information on other factors apart from gender stereotyping that affect female students' performance in science subjects.

### ***Interview Guide***

An interview guide was used to collect qualitative data by probing with open-ended questions which elicited opinions from teachers of science who gave a deeper understanding of the subject matter. These were used to triangulate the quantitative data which helped to close the gaps left by the closed-ended responses in the questionnaire. The interview guide consisted of six (**6**) guiding questions on gender stereotyping, and female students' performance in sciences (See Appendix D).

### **Data quality control**

#### ***Validity of the Questionnaire***

Validity refers to the extent to which the instrument measures what it is intended to measure with accuracy (Kothari, 2004). Two supervisors evaluated the relevance of each item in the instrument to the stated research objectives, and these items were rated as either relevant or not relevant to measure the objectives. Then the validity of the instruments was arrived at using the content validity index

$$\frac{\text{Number of items rated relevant}}{\text{Total number of items}}$$

The CVI= Number of relevant items (11)/Total number of items (13) was calculated and found to be 0.846 for gender stereotyping and (7/8) for female student performance was 0.875. This is acceptable since it is greater than 0.70 as recommended by Newnan (2013).

***Reliability of the Questionnaire***

Reliability is the degree to which the research tool yields persistent results after being subjected to repeated trials (Mugenda & Mugenda, 2003). Reliability analysis was determined by data from a pilot study in an independent school that was not selected before actual data collection. The instruments were administered to **5** teachers, and **10** students and were administered again after a week’s interval. Then Cronbach’s Alpha coefficient was computed using SPSS. According to Nunnally (1978), any instrument with an Alpha coefficient value above 0.7 is considered reliable, and the reliability test results were tested for this threshold. The reliability, and validity results are as seen in Table 2 below.

**Table 2: Reliability of results**

Variable	Number of Items	Cronbach’s Alpha
Gender Stereotyping	11	0.867
Female Students’ Performance	07	0.786

*Source: Primary Data, (2022)*

From the Table 2 above, the Cronbach alpha for gender stereotyping is 0.867, and female students’ performance in science (0.786).

**Procedure of Data Collection**

The researcher obtained a letter of introduction from the Directorate of Graduate Studies, Research and Innovations, introducing me to the schools, and seeking permission to conduct research. The researcher then proceeded to seek permission from head teachers of the different secondary schools in Baitambogwe Sub-County, Mayuge District to allow me to

obtain data from students and one available science teacher. Thereafter, questionnaires were administered and interviews were carried out with the help of research assistants who were teachers in respective schools.

### **Measurement of the Study Variables**

The variables were measured using already established items for instance, gender stereotyping was measured by 11 items which were adopted from Ampaire et al., (2021); Brew et al.(2022); Mwangi et al., (2013), and Piatek-jimenez et al.,(2018) as seen in the closed-ended questionnaire in section B. Female students’ performance in science subject was measured by 7-item scale modified from Brew et al., (2022); Forgasz et al., (2004), and Mhango, and Elias(2014) as seen in section C of the questionnaire. The questionnaire anchored on a 5-point Likert scale (5 = strongly agree; 4 = agree; 3 = Not sure; 2 = disagree; 1 = strongly disagree) was used to collect quantitative data. In-depth information regarding the study variables was gathered using the interview guide (see Appendix D).

### **Data Management**

Data from questionnaires was collected from all the schools. Those that were filled were sorted, and coded. Quantitative data were thereafter entered into the statistical package for the Social Sciences (SPSS) System version 23 for analysis. The scores were presented in the form of a table for better interpretation, and management as shown in Table 3. Qualitative data was typed out and organized into themes for analysis.

**Table 3: Score ranges of variable results**

<b>Item Category</b>	<b>Low</b>	<b>Moderate</b>	<b>High</b>
Level of Gender Stereotyping	1.0-2.0	2.1-3.9	4.0-5.0
Level of Female Students' performance in science	1.0-2.0	2.1-3.9	4.0-5.0

*Source: Primary Data, 2022*

## **Data Analysis**

### ***Qualitative Data Analysis***

Qualitative data was analyzed using the thematic analysis technique. Responses were grouped according to five themes; gender stereotyping, academic performance, income, school environment and career guidance. This information was then triangulated with the quantitative data from the questionnaires.

### ***Quantitative Data Analysis***

Descriptive statistics like mean and standard deviation were used to determine the level of gender stereotyping and the level of academic performance in secondary schools. Pearson product-moment correlation coefficient ( $r$ ) was used to analyze the relationship between gender stereotyping and academic performance. Then a regression analysis was run to determine the regression effect of gender stereotyping on academic performance.

## **Ethical Considerations**

To obtain accurate and reliable data, the ethical issues were considered anonymity, confidentiality, voluntary consent, risk of harm, informed consent and pre-requisite permission. The researcher ensured that the identity of the participant was unknown because respondents were not required to indicate their names on the research tools. Similarly, respect for confidentiality was promoted in that the participants' identities were known to the researcher while the risk of harm was minimized by isolating and minimizing physical and emotional harm as well as informing the participants of the risk nature (Mugenda and Mugenda, 2003).

In order to obtain informed and voluntary consent, participants were made aware of what they were asked, the intended purpose of the data, the right to access information and withdraw at any point, and the effects of participation and in return they gave consent to participate.

## Chapter Four: Results

### Introduction

This section consists of the response rate, demographic characteristics, and findings on the level of gender stereotyping, level of academic performance, the influence of gender stereotyping on academic performance, and other factors influencing academic performance.

### Response Rate

Table 4 below shows the response rate of students' questionnaires and teachers' interviews.

**Table 4: Response Rate**

Rate	Frequency	Percentage (%)
Returned questionnaires out of 318	310	97.5
Teachers interviewed out of 9	09	100.0
<b>Overall return rate</b>	<b>319</b>	<b>97.6</b>

*Source: Primary Data, (2022)*

Out of the 318 administered questionnaires to the selected students from 9 selected secondary schools in Baitambogwe Sub-County, 310 questionnaires were returned indicating a 97.5% return rate while all the 9 selected science teachers were interviewed indicating a 100% response rate. This represented an overall successful response rate of 97.6%.

### Demographic characteristics

Demographic information was obtained on their gender, age, type of school, and school schedule. This was presented using frequencies, and percentages. The 9 teachers who responded included 5 male teachers and 4 female science teachers. Table 5 shows the demographic characteristics of students who responded.

**Table 5: Demographic characteristics of students who responded (N = 310)**

	Frequency	Percent	Total
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				<b>Frequency</b>	<b>Percentage</b>
<b>Gender</b>	Male	115	37.1		
	Female	195	62.9	<b>310</b>	<b>100.0</b>
<b>Age</b>	Below 20	295	95.2		
	21 – 30	15	4.8	<b>310</b>	<b>100.0</b>
<b>Type of school</b>	Government aided	139	45.0		
	Private school	171	55.0	<b>310</b>	<b>100.0</b>
<b>School schedule</b>	Day only	97	31.3		
	Day and Boarding	213	67.1	<b>310</b>	<b>100.0</b>

*Source: Primary Data, (2022)*

The results in Table 5 indicated that more females 195 (62.9%) participated in the study than their male counterparts 115 (37.1%). This reflects the accommodation of opinions of both genders demonstrating a fair gender balance in the secondary schools. The results further showed that the largest proportion 295 (95.2%) of the respondents were below 20 years, and 15 (4.8%) were between 21- 30 years, this is because participants below 20 years have younger brains which are eager to learn and with fewer responsibilities compared to the age bracket above twenty. As regards the type of school, the study results showed that the majority of the respondents 171 (55.0%) were from private schools while 139 (45.5%) were from government-aided schools. This revealed that most of these government-aided schools are more affordable compared to the private ones.

The findings for school schedule showed that the majority of the respondents attended day, and boarding schools with a representation of 213 (67.1%), and 97 (31.3%) were purely in day schools. These results indicated that many schools feel that including a boarding section increases their population and students' performance.

**Objective One: Level of Gender Stereotyping in Secondary Schools in Baitambogwe Sub-County, Mayuge District.**

Objective one sought to assess the level of gender stereotyping, and the information obtained was analyzed under the question “What is the level of gender stereotyping in secondary schools in Baitambogwe Sub-County, Mayuge District? Table 6 shows the descriptive characteristics of GS in secondary schools including the number & percentage of the students’ responses, their mean, standard deviation and level.

**Table 6: Descriptive statistics on gender stereotyping in secondary schools in Baitambogwe Sub-County, Mayuge District**

Item	SD	D	NS	A	SA	M	SD	Level
1. In our School, boys are seen more competent in sciences compared to girls.	59(19.0%)	29(9.4%)	82(26.5%)	79(25.5%)	54(17.4%)	3.17	1.37	Moderate
2. In this school, boys have higher intellectual abilities in science related subjects than girls.	56(18.1%)	44(14.2%)	72(23.2%)	84(27.1%)	43(13.9%)	3.12	1.35	Moderate
3. I feel that science related subject combination are fit for boys because they require a lot of time and hard work.	89(28.7%)	64(20.6%)	49(15.8%)	65(21.0%)	67(21.6%)	2.71	1.43	Moderate
4. Boys are more willing than girls to work in science related areas.	66(21.3%)	60(19.4%)	44(14.2%)	73(23.5%)	53(17.1%)	3.05	1.47	Moderate
5. Boys are more interested in careers which require science ability than girls are.	53(17.1%)	61(19.7%)	58(17.1%)	85(27.4%)	56(18.1%)	3.08	1.36	Moderate
6. Boys are more determined than girls and this is what science subjects require to have higher grade achievement.	54(17.4%)	55(17.7%)	70(22.6%)	75(24.5%)	68(21.9%)	3.08	1.36	Moderate
7. Boys have higher logical thinking that are needed in sciences than girls have.	73(23.5%)	55(17.7%)	53(17.1%)	61(19.7%)	33(10.6%)	2.99	1.48	Moderate
8. In this school, boys are more favoured than girls and thus endowed to take on more challenges and hard science subjects.	112(36.1%)	65(21.0%)	63(20.0%)	37(11.9%)	57(18.4%)	2.40	1.36	Moderate
9. Boys understand science related	63(20.3%)	54(17.4%)	66(21.3%)	70(22.6)	44(14.2%)	3.01	1.40	Moderate
10. concepts more easily than girls do.								
11. Boys have higher logical thinking abilities that are needed in STEM than girls have.	81(26.1%)	42(13.5%)	81(26.1%)	81(26.1%)	52(16.8%)	2.83	1.39	Moderate
12. In our school, boys are intelligent as far as sciences are concerned compared to girls	60(19.4%)	62(20.0%)	73(23.5%)	63.20.3%)	61(19.7%)	2.95	1.36	Moderate
<b>13. Overall gender stereotype score</b>						<b>3.38</b>	<b>10.10</b>	<b>Moderate</b>

Source: Primary data (2022)

The results in Table 6 show that there was generally a moderate level ( $M = 3.38$ ,  $SD = 10.10$ ) of overall gender stereotyping as well as for the individual items. The distribution of responses to whether boys are seen as more competent in sciences compared to girls was as follows: 88(28.4%) disagreed, 82(26.5%) were not sure, and 133(42.9%) agreed giving an overall moderate level of agreement ( $M = 3.17$ ,  $SD = 1.37$ ) implying the data was close to the mean value. The overall moderate level of GS implies that some of the students believed that boys were more likely to have a positive attitude in sciences than girls.

With responses concerning boys having a higher intellectual ability in science-related careers than girls reported: 100(32.3%) disagreed, 72(23.2%) were not sure, and 127(41%) agreed giving a moderate level of GS of ( $M = 3.12$ ,  $SD = 1.35$ ). The moderate level of GS reports that some of the students support the idea of boys being more intelligent than girls while others disagree and the responses were tightly clustered.

Findings about science-related subjects' combinations being fit for boys because they require a lot of time, and hard work were as follows: 153(49.3%) disagreed, 49(15.8%) not sure, 132(42.6%) agreed reporting an overall moderate level of GS of ( $M = 2.71$ ,  $SD = 1.43$ ) which is also close to the mean. This implies that students probably think that boys have a positive attitude towards sciences while most girls have a negative attitude in offering science combinations but all did not differ so much.

Responses whether boys are more willing than girls to work in science-related areas indicated 126(40.7%) disagreed, 44(14.2%) were not sure, 126(40.6%) agreed giving a moderate level of GS of ( $M = 3.05$ ,  $SD = 1.47$ ). There is an insignificant difference between boys, and girls towards willingness to work in science-related areas. Suggesting that both boys and girls work equally towards achievement in science-related areas

Responses that boys are more interested in careers that require science ability than girls are 114(36.8%) disagreed, 58(17.1%) not sure, 141(35.5%) agreed giving a moderate level of GS of ( $M = 3.08$ ,  $SD = 1.36$ ). Both girls and boys are interested in science-related careers. However, those who agree do it with bias related to the society that sciences are for boys but the differences were small.

Concerns that boys are more determined than girls, and this is what science subjects require to have higher grade achievement was as follows: 109(35.1%) disagreed, 70(22.6%) not sure, 143(46.4%) agreed indicating a moderate level of GS ( $M = 3.08$ ,  $SD = 1.36$ ). This implies that boys are physically stronger, and emotionally stable compared to girls. This gives them an advantage to be determined in pursuing science.

Findings that boys have higher logical thinking abilities that are needed in sciences than girls resulted in 128(41.2%) disagreeing, 53(17.1%), not sure, 94(30.3%) agreed indicating an overall moderate level of GS ( $M = 2.99$ ,  $SD = 1.48$ ) but did not differ so much. Society takes the male gender to be superior to the female gender therefore it boosts confidence in the boys when it comes to logical thinking compared to girls, and this is important for performance in science.

Findings that boys are more favored than girls, and thus endowed to take on more challenging, and hard science subjects were as follows: 177(53.5%) disagreed, 63(20.0%) were not sure, 94(30.3%) agreed indicating a moderate level GS ( $M = 2.40$ ,  $SD = 1.36$ ) with close responses suggesting that girls are favored, and endowed in challenging, and hard science subjects probably because they are given more privileges compared to boys, for instance, the extra 1.5 points for girls joining universities.

Responses to whether boys understand science-related concepts more easily than girls do resulted in 117(37.7%) disagreed, 66(21.3%) not sure, 114(36.8%) agreed giving a moderate level of GS ( $M = 3.01$ ,  $SD = 1.40$ ). There is a negligible difference in boys understanding science-related concepts compared to girls. This implies that the intelligent quotient of both boys and girls is similar.

Findings that boys have higher logical thinking abilities that are needed in STEM than girls resulted in 123(39.6%) disagreeing, 81(26.1%), not sure, 133(42.9%) agreed indicating an overall moderate level of GS ( $M = 2.83$ ,  $SD = 1.39$ ). Society takes the male gender to be superior to the female gender therefore it boosts confidence in the boys when it comes to logical thinking compared to girls, and this is important for performance in science but the differences are significant.

With responses concerning boys having a higher intellectual ability in science-related careers than girls reported: 122(39.4%) disagreed, 73(23.5%) were not sure, and 124(40%) agreed giving a moderate level of GS of ( $M=2.95$ ,  $SD=1.36$ ). The moderate level of GS reports that some of the students support the idea of boys being more intelligent than girls while others disagree but their differences are negligible.

The study results indicated a moderate level ( $M = 3.38$ ,  $SD = 10.10$ ) indicating that the data obtained was within the range of 10.1 from the mean of 3.38. This moderate level of gender stereotyping was also shown in findings from the interviews conducted in which one of the respondents said;

"Generally, boys understand science-related concepts more especially calculations than girls. However, we always encourage female students to offer science-related subject

combinations, and some have opted for sciences acting as role models to others more especially those in lower classes” (interviewee 08, 5<sup>th</sup> October 2022).

From such a response, the teacher seems to agree that there’s still a bias against female students that they can’t perform sciences in some schools. In addition, one of the teachers said, “I can say teachers have endeavoured to build confidence, and interest among female students as regards science subjects, yes, and the students’ perception towards science subjects is gradually increasing although girls appear to have low thinking abilities and less intelligent compared to boys as regards science, we congratulate ourselves in one way or another for the initiatives teachers have employed to build some kind of determination among the female students.” (Interviewee 02, 13<sup>th</sup> October 2022).

The response of the respondents is in line with the Expectancy-value achievement motivation theory which stresses that female students’ academic choices, decisions, achievements, persistence, and performance are dependent on the perception of the teachers, and students on the roles they can perform. Similarly, another participant interviewed had this to say,

“Boys are more endowed to take on more challenging, and hard science subjects like physics, chemistry, and biology, they are more determined and therefore, end up scoring high grades in these subjects. In this school, girls are less willing to work in science-related activities, especially during science fairs held in, and outside the school environment” (Interviewee 04, 18<sup>th</sup> October 2022).

Such a response from a teacher of science seems to suggest that to some extent gender stereotyping exists in a school environment. One of the participants, when asked to what extent the gender stereotyping manifests, responded that;

“Although girls in this school are weak, and less competent in sciences compared to their counterparts, we provide some female science role models that have boosted their interests, and attitude towards science subjects and now more try to do their best just like boys.” (Interviewee 01, 6th October 2022).

The responses of the teachers of science above indicate that there is a moderate level of gender stereotyping in secondary schools in Baitambogwe Sub-County, Mayuge District.

**Objective Two: The Level of Academic Performance in Science Subjects among Female Students in Secondary Schools, Baitambogwe Sub-County, Mayuge District**

The findings answered the research question “What is the level of academic performance in science subjects among female students in secondary schools in Baitambogwe Sub-County, Mayuge District? Descriptive statistics involving the mean and standard deviation were used to determine the level of female students’ performance in science.

**Table 7: Descriptive statistics on female students' performance in science.**

<b>Item</b>	<b>SD</b>	<b>D</b>	<b>NS</b>	<b>A</b>	<b>SA</b>	<b>M</b>	<b>SD</b>	<b>Level</b>
Female students actively participate in the science subjects during class lessons and get good results	14(4.5%)	32(10.3%)	31(10.0%)	111(35.8%)	122(39.4%)	3.95	1.147	Moderate
In this school, female students get good grades in science related subject.	24(7.7%)	38(12.3%)	69(22.3%)	111(35.8%)	68(21.9%)	3.52	1.184	Moderate
In this school, girls show high level skill attainment in sciences during science related competitions held.	15(4.8%)	37(11.9%)	82(26.5%)	87(28.1%)	87(28.1%)	3.64	1.157	Moderate
There is improvement in aggregates of female students in science subjects over last term.	17(5.5%)	41(13.2%)	59(19.0%)	106(34.2%)	87(28.1%)	3.66	1.176	Moderate
The academic performance of female students in science subjects is exceeds that of their male students, based on recent test scores.	12(3.9%)	21(6.8%)	34(11.0%)	73(23.5%)	170(54.8%)	4.19	1.116	High
Female students consistently achieve high scores in science subjects.	20(6.5%)	36(11.6%)	76(24.5%)	104(33.5%)	74(23.9%)	3.57	1.160	Moderate
In this school, girls pass science subjects highly.	31(10%)	44(14.2%)	74(23.9%)	85(27.4%)	76(24.5%)	3.42	1.274	Moderate
<b>Overall Female student's performance score</b>						<b>3.83</b>	<b>5.407</b>	<b>Moderate</b>

*Source: Primary data (2022)*

From Table 7, responses from female students actively participating in science subjects during lessons indicated as follows: 46(14.5%) disagreed, 31(10%) not sure, 233(75.2%) agreed giving a moderate level of APFS of ( $M = 3.95$ ,  $SD = 1.147$ ) with insignificant differences. This implies that probably a good classroom environment like forming groups, where every learner is given equal opportunity to participate, hence improving their performance.

Findings from female students getting good grades in science-related subjects resulted in; 62(20%) disagreeing, 69(22.3%) not sure, 179(57.7%) agreeing giving a moderate level of APFS of ( $M = 3.52$ ,  $SD = 1.184$ ). Suggesting that female students are allowed opportunities to engage in science assignments to improve their competence levels in science thus leading to good grades. However, there were insignificant differences in their responses.

Results from whether there is improvement in aggregates of female students in science subjects over last term showed; that 58 (18.7%) disagreed, 59(19.0%) were not sure, 193(62.3%) agreed leading to a moderate level APFS of ( $M = 3.66$ ,  $SD = 1.176$ ). This implies that there is an agreement on the increase in the scores attained in each science subject.

Findings from whether the academic performance of female students in science subjects exceeds that of their male students, based on recent test scores, show that 33(10.7%) disagreed, 34(11.0%) not sure, 243(78.3%) agreed giving a high level of APFS ( $M = 4.19$ ,  $SD = 1.116$ ) with minimal deviations. This implies that there was strong agreement that girls perform better than boys in school.

Results on whether girls show high level skill attainment in sciences during science-related competitions held were; 52(16,7%) disagreed, 82(26.5%) not sure, 174(56.2%) agreed giving a moderate level APFS of ( $M = 3.64$ ,  $SD = 1.157$ ). Implying that probably

when some girls are given tasks to perform during these science competitions perform better than others while doing the same task and their responses did not differ so much.

Findings from whether female students consistently achieve high scores in science subjects in tests were as follows; 56(18.1%) disagreed, 76(24.5%) were not sure, 178(57.4%) agreed leading to a moderate level APFS of ( $M = 3.57\%$ ,  $SD = 1.6$ ). This suggests that girls find sciences easy allowing them to practice regularly and excel every term and their responses differed slightly.

Results from girls passing science subjects highly indicated; 75(24.2%) disagreed, 74(23.9%) not sure, 161(51.9%) agreed giving a moderate level APFS of ( $M = 3.42$ ,  $SD = 1.274$ ). This probably means that some of these female students perform well because of the favourable environment within their schools like the availability of teachers of science, and well-equipped science laboratories among others which might not be in other schools and the responses did not differ so much.

The overall study findings ( $M = 3.83$ ,  $SD = 5.40$ ) indicated a moderated level of female students' performance in science in secondary schools in Baitambogwe Sub-County, Mayuge District and showed significant differences.

These statistics are consistent with the findings from the interviews carried out among the teachers of science who gave divergent views on female students' performance in science in secondary schools in Baitambogwe Sub-County, Mayuge District. One of them had this to say,

“Few female students score high grades in science subjects like chemistry, mathematics, and physics in both internal and external assessments. He also noted that, for the last five years, the school has not registered any candidate for UCE results who has scored a distinction in any of the science subjects.” (Interviewee 06, 18th October 2022).

The moderate levels of female students' performance in science can be partly supported by one teacher who said "The majority of the female students do not participate by doing the work in science subjects more especially in mathematics." (Interviewee 03, 17th October 2022).

On the contrary, another participant revealed that female students regularly attend to their lessons to some reasonable extent. This interviewee said: "They attend almost all lessons but maybe they are able to understand a few concepts in science subjects. I will say their attendance to lessons has not been bad." (Interviewee 05, 21st October 2022).

The moderate levels of female students' performance in science was attributed to some factors other than gender stereotyping for example in one interview, a teacher of science revealed that "Most of the science laboratories lack equipment for practical lessons, low initiative among teachers of science, and lack of role models among other factors" (Interviewee 07, 11th October 2022).

Drawing from the different responses of the above respondents, female students' performance in science subjects in Mayuge is moderate because in some schools the female students seemed to be performing relatively poorly than in others, which is in agreement with the quantitative results.

**To examine the influence of Gender Stereotyping on Academic Performance in Science Subjects among Female Students in Secondary Schools in Baitambogwe Sub-County, Mayuge District.**

First, the study tested for correlation analysis using the Pearson bi-variate correlation coefficient in order to determine the strength, and direction of the relationship between gender stereotyping, and academic performance in science subjects among female students. The results are shown in the Table 8.

**Table 8: Analysis Results of Correlation**

Correlations		Gender Stereotype Score	Female Students Performance Score
Gender Stereotype Score	Pearson Correlation	1	-.506**
	Sig. (2-tailed)		.000
	N	310	310
Female Students' Performance Score	Pearson Correlation	-.506**	1
	Sig. (2-tailed)	.000	
	N	310	310

**Correlation is significant at the 0.01 level (2-tailed).**

*Source: Primary Data, (2022).*

The results in Table 8 indicate a moderately strong negative relationship between gender stereotyping, and female students' performance in science ( $r = -0.506, p < 0.01$ ). The results mean that an improvement in female students' performance in science is associated with a reduction in gender stereotyping. This result correlates with one of the interviewees' responses;

“Once female students' attitude towards science subjects is raised by teachers through counselling sessions, they will be able to actively participate, attend science lessons, and score high grades in subjects such as mathematics, chemistry and physics” (Interviewee 09, 19th October 2022).

In other words, the respondent seemed to suggest that when teachers' attitude towards performance in science by females is positive, their performance in science is improved. Further analysis was done to determine the cause-effect relationship between gender stereotyping, and academic performance of female students in sciences. By doing this, a simple linear regression was done, and the results are summarized in Table 9 below.

**Table 9: Regression Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.506 <sup>a</sup>	.256	.254	4.67067

a. Predictors: (Constant), Gender Stereotype Score

*Source: Primary data (2022)*

The results in Table 9 indicate an Adjusted R Square value of .254 which implies that variations in GS account for 25.4% of the variance in Female Students' Performance in sciences in Secondary Schools in Baitambogwe Sub-County, Mayuge District.

The ANOVA test results are shown in Table 10.

**Table 10: ANOVA Test results**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2316.108	1	2316.108	106.170	.000 <sup>b</sup>
	Residual	6719.067	308	21.815		
	Total	9035.174	309			

A. Dependent Variable: Female Students' Performance Score

B. Predictors: (Constant), Gender Stereotype Score

*Source: Primary data, (2022)*

Results in Table 10 indicate that the data on the influence of GS on APFS fit the model ( $F = 106.170, p < 0.01$ ). The Regression coefficients are shown in Table 11.

**Table 11: Regression Coefficients of the influence of Gender Stereotyping on Academic Performance in science subjects among Female Students.**

Coefficient <sup>a</sup>						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	34.723	.892		38.929	.000
	Gender Stereotype Score	-.271	.026	-.506	-10.304	.000

a. Dependent Variable: Female Students Performance Score

Source: Primary Data (2022)

Table 11 shows a statistically significant Regression effect of APFS on GS ( $\beta = -.506$ ,  $t = -10.304$ ,  $p < 0.01$ ) implying that there is a negative weak relationship between GS and APFS. This implies that for every unit increase in GS, there was a 0.506 unit decrease in APFS. Thus, the hypothesis “There is a statistically significant regression effect of gender stereotyping on academic performance of females in science subjects” was accepted. In other words, gender stereotyping significantly influences female students’ performance in science.

#### **Other Factors that Influence Female Students’ Performance in Science Subjects.**

Apart from gender stereotyping, other factors influence female students’ performance in science. These are sought from both teachers and students as shown in Table 12.

**Table 12: The number of teachers and students who responded on other factors that influence female Students' Performance in Science Subjects**

<b>Thematic content</b>	<b>No of participants</b>	<b>Percentage</b>	<b>Ranking</b>
School environment	182	57	1
Career guidance	112	35	2
Family income	25	08	3
<b>Total</b>	<b>319</b>	<b>100</b>	

*Source, Primary Data (2022)*

The overall suggestions from both teachers' interviews, and students' questionnaires were ranked as below.

### **School environment factors**

There were 182 participants, accounting for 57% of those in support of school environment factors. This factor was ranked first. The school environment includes classrooms, school location, human resources, and learning materials like textbooks among others as noted by the participants. Some participants noted that the lack of enough teachers of science discourages females from performing well. In the interviews, some teachers observed the role of school environment as one of the factors influencing female performance while in some questionnaires, students said that lack of textbooks and laboratory materials contributed to poor academic performance. One student responded

“Our head teachers keep changing colleagues from one term to another who come with totally different teaching methods, which affects the students because they take long to adjust.” (Interviewee 08: 5th October 2022).

Other participants observed the congestion in their classrooms

“Emphasized that the students are too many in the classroom, and during the chemistry practicals, it's very difficult for you to move around supervising their

work. If a student is not aggressive, you might take the whole term without even marking the book.” (Interviewee 10, 6th October 2022).

Others cited the too much workload on the general school timetable which makes the female students not to concentrate fully on revising their books.

### **Career guidance factors**

These ranked, 2<sup>nd</sup>, with 112 participants, and a percentage of 35 who supported career guidance as a factor that influences female students’ performance in science. Some participants noted that the lack of enough female role models in the science field discourages females from offering science. This is because they lack someone to look up to. One teacher said that

“If one took a good look at our staffroom the number of female teachers is very small compared to their counterparts which leaves these female students to believe that sciences are for men only.” (Interviewee 3, 17<sup>th</sup> October 2022).

Also, some teachers highlighted that lack of parental support brings about poor female performance in science especially when these parents are uneducated. They leave their children to choose their combinations without any clear guidance.

### **Family income factors.**

These were ranked 3<sup>rd</sup>, with 25 participants, and a percentage of 08 supporting them. Participants cited that poverty affected their performance in science in terms of parents not paying school fees on time, and providing some scholastic materials like pens, and books. A teacher noted that

“Many parents don’t pay for their children money for feeding, and yet at times these students go without a meal at home so, they claim not to understand the afternoon lessons which are mostly practical lessons because of hunger”. (Interviewee 1, 6<sup>th</sup> October 2022).

Another issue noted under family income was the menstruation challenge. Some females were not given sanitary pads in time because their parents lacked money. So, they end up missing school which affects their performance in science.

## **Chapter Five: Discussion of Findings, Conclusions, and Recommendations**

### **Introduction**

The chapter comprises of discussion of findings, conclusion, recommendations, limitations, and areas for further research as guided by the study objectives.

### **Discussion of the Study Findings**

#### **Level of Gender Stereotyping in Secondary Schools in Baitambogwe Sub-County, Mayuge District**

Study objective one sought to assess the level of gender stereotyping in secondary schools in Baitambogwe Sub-County, Mayuge District. The findings revealed that there was generally a moderate level of gender stereotyping in secondary schools in Baitambogwe Sub-County, Mayuge District. The study results mean that teachers', and students' perception as regards female students' performance in science subjects is still poor. This is in agreement with Parameswari (2020) who notes that even though higher education was opened to females three hundred years ago, females are naturally not good at science This is because they are considered to have lower intellectual abilities compared to boys.

However, some teachers of science revealed that some girls understood, and conceptualized the science concepts better than even boys. It should be noted that teachers of science indicated that more girls are interested in offering biology as compared to boys. This is in agreement with Krueger (2017) who establishes that girls perceive biology as having fewer calculations, and more reading than physics, and chemistry hence the interest. The researcher noted that while some schools did their best to reduce gender stereotyping, others seemed not to get bothered. In some cases, the perceptions of both students, and teachers were better in those schools leading to low gender stereotyping while in others the perception of students, and teachers were found to be very poor, and high levels of gender stereotyping were experienced Therefore, the moderate levels of gender stereotyping could

be due to poor attitude towards female students' performance in science by both teachers and students in secondary schools in Baitambogwe Sub-County, Mayuge District.

***The Level of Academic Performance in Science Subjects among Female Students in Baitambogwe Sub-County, Mayuge District***

Study objective two sought to establish the level of academic performance in science subjects among female students in secondary schools in Baitambogwe Sub-County, Mayuge District. It was found that there was a moderate level of female students' performance in science in Baitambogwe Sub-County, Mayuge District. The results mean that the attendance, class Participation, skills Attainment as well, as grade Scores among the female students in the different secondary schools in Baitambogwe Sub-County, Mayuge District is moderate. Findings in Baitambogwe Sub-County, Mayuge District schools revealed that female students' performance is so poor simply because these students don't actively participate in mathematics as expected. Studies by Nakisinde (2010) cited by Eshiwani (2002) agreed that girls in Uganda generally have a negative attitude towards math, and these attitudes tend to depress participation, and academic performance. This implies that more of female students are underrepresented in the science fields because the bad performance continues.

In addition, these results could be because there are other factors other than gender stereotyping that influence performance in science subjects among female students in secondary schools meaning that even if the gender stereotyping is reduced to a minimal level, some of the female students would still perform poorly in science subjects. This is further reinforced by the findings of Gonzalez et al., (2020) who acknowledge that the status of female students' performance in science is poor resulting in few women taking a course in STEM fields.

It can therefore, be concluded that female students' performance in science in secondary schools in Baitambogwe Sub-County, Mayuge District is just moderate, and not only attributable to gender stereotyping but also other factors which may play a critical role in increasing female students' performance in science like school environment and career guidance among other factors.

***To examine the Influence of Gender Stereotyping on Academic Performance in Science Subjects among Female Students in Secondary Schools in Baitambogwe Sub-County, Mayuge District.***

The third objective was to examine the Influence of Gender Stereotyping on Academic Performance in Science Subjects among Female Students in Secondary Schools in Baitambogwe Sub-County, Mayuge District. The study results ( $\beta = -.271$ ,  $t = -10.304$ ,  $p < 0.01$ ) indicated a moderate negative, and statistically significant relationship between gender stereotyping, and female students' performance in science. The implication of the study results is that reduction in gender stereotyping through exhibition of positive attitudes by teachers, and students is key for improved female students' performance in science in secondary schools.

The above findings are supported by Ampaire et al., (2021) showed that teachers should enhance gender equality, and reduce gender classification in daily teaching. The study results support the earlier literature in the education profession which has argued that gender stereotyping predicts female students' academic performance in science-related subjects (Igbo et al., 2015; Nabunya, Curley, & Ssewamala, 2021; Starr & Simpkins, 2021). The rationale is that reducing gender stereotyping increases female students' class participation, and development of skills in science subjects (Nabbuye, 2018). This study bridges these gaps by being the first of its kind to be conducted in Uganda and demonstrated that gender stereotyping negatively, and statically predicted female students' performance in

science in secondary schools. These findings are in line with Wu (2022) who reveals that when stereotypes are not activated, individuals tend to rate the academic achievement of girls higher than boys. Therefore, this study established that reduced gender stereotyping through positive perception of teachers, and students towards female students is a key ingredient in improving female students' performance in science in secondary schools.

### ***Other Factors that Influence Female Students' Performance in Science Subjects***

The findings show that there are factors other than gender stereotyping that do predict female students' performance in science among secondary school students in Baitambogwe Sub-County, Mayuge District. These factors include school environment, career guidance, peer influence, family income, and parental involvement. The study revealed that the school environment affected female students' performance in science in that in those schools where the environment was observed to be conducive, female students' performance was better than those in secondary schools whose environment was not considered conducive. For instance, female students in secondary schools with adequate teachers of science, and infrastructures such as science laboratories, classrooms, and recreational facilities in place had better performance in science than those in secondary schools where the teachers, and infrastructure were not sufficiently provided and this is supported by Chizimba et al., (2021) who found that the factors that affect students' performance include availability of quality teachers, teaching methods and learning materials.

Another factor found to predict female students' performance in science was career guidance, and counselling as regards science-related career aspirations. career guidance influences female students' performance in science as it heightens self-esteem among the female students which improves their performance in science-related subjects. This agrees with Mudulia et al., (2017) who noted that the provision of career guidance to female

students provides a positive, and significant impact on the academic performance, and career choices of high school girls.

Family income was another factor that was found to influence female students' performance in science. For example, some parents don't have enough money to provide school to buy scholastic materials that are needed by the students like books, pens and sets among others which affects their performance. Maseraku et al (2022) are in support of the above when they found that low-income children showed lower verbal interactions, phonological awareness, and lower academic performance than their counterparts from high and middle-income families. Additionally, the menstruation challenge was another challenge observed where females were not provided with sanitary pads in time because their parents didn't have money. In support of the above, Sihag, and Poonam (2022) asserted that inadequate opportunities to practice healthy menstrual hygiene received attention as a barrier to education for girls in middle-income economies, hence leading to absenteeism affecting their performance in science.

## **Conclusions**

The study made the following conclusions in line with the objectives of the study.

### **Objective One**

Gender stereotyping moderately manifested in secondary schools in Baitambogwe Sub-County. It was concluded that a moderate level of gender stereotyping has improved the perception and attitudes of female students towards academics.

### **Objective two**

The level of female students' academic performance in science was moderate among the secondary schools in Baitambogwe Sub-County, Mayuge District and this is supported by Nakisinde (2010). Therefore, this moderate level of academic performance implies that

females can do better in science subjects when the limiting factors of academic performance are low.

### **Objective three**

There was a moderate, negative, and statistically significant influence of gender stereotyping on female students' performance in science in secondary schools in Baitambogwe Sub-County. The implication is that the lower the level of gender stereotyping in the school, the higher the level of female academic performance in secondary school. The study concluded that reducing gender stereotyping is crucial for improved female students' performance in science.

### **Objective Four**

Though reducing gender stereotyping enhances female students' performance in science, there are other factors which contribute to increased female students' performance in science like improving their self-esteem, confidence, and interest in science subjects. In conclusion, the study revealed that school environment, career guidance and family income are the other key factors that influence the academic performance of female students.

### **Recommendations**

The study recommends that the implementation of gender-sensitive programs should be closely monitored by government agencies to ensure appropriateness and consistency.

School administrators should endeavour to involve parents, non-government organizations, as well as the government in the pursuit to motivate female students to pick interest in science subjects.

The study recommends that government, non-government organizations, and school administrators should focus on the development of appropriate gender-related programs that foster positive attitudes in order to enhance female students' performance.

The Ministry of Education and Sports should monitor the effective implementation of some government policies like the Gender in Education Policy (2009).

### **Limitations to the Study**

The study adopted a cross-sectional survey design for a scope of four (2019-2022) years and thus did not capture the changes in gender stereotyping over the past decades.

The study was carried out in secondary schools in the Baitambogwe sub-county which is still rural thus the findings can't be generalized to other urban areas and also in other education institutions like primary and university.

### **Areas of further research**

Further studies should be carried out in other educational settings such as primary schools, tertiary institutions as well as universities.

Similar studies should be carried out in secondary schools in urban areas to generalize the findings.

## **References**

- Akinyemi, S., & Bassey, O. I. (2012). Planning and funding of higher education in Nigeria: The challenges. *International Education Studies*, 5(4), 86–95.
- Akuaku, J. (2015). Information communication technology and its impact on senior high school students in Ghana: A case study of Accra Metropolis, University of Ghana. <http://ugspace.ug.edu.gh>
- Alexander, V. B. (2020). Math-gender stereotypes and math self-concept – A cross-sectional study. *Chair of Learning Sciences and Higher Education*, 1–17.
- Alipio, M. M. (2020). Predicting academic performance of college freshmen in the philippines using psychological variables and expectancy-value beliefs to outcomes-based education: A Path Analysis. *Education & Administration*, 1–15.
- Almukhambetova, A., & Kuzhabekova, A. (2020). Factors Affecting the Decision of Female Students to Enroll in Undergraduate Science, Technology, Engineering and

- Mathematics majors in. *International Journal of Science Education ISSN*, 42(6), 934–954.
- Alsos, G. A., Hytti, U., Ljunggren, E., Rönnblom, M., & Keisu, B. I. (2013). Constructions of Innovation and Gender (equality) in Swedish universities. *International Journal of Gender and Entrepreneurship*.1756-6266, E-ISSN1756-6274, Vol.5, no 3S
- Ampaire, A., Kajumba, M. M., Muwagga, A. M., & Kimera, E. (2021). Gender Stereotypes and Career Choice: An Exploration into the Experiences of Ordinary Level Secondary Students in Uganda. *Journal of Popular Education in Africa*, 5(10), 19–38.
- Asiimwe, J. A. (2013). Compulsory Science Policy: Enhancing Gender Equality in Education? A case study of Academic Achievement in Uganda. *MIER Journal of Educational Studies, Trends & Practices*, 3(2), 183–194.
- Baker, D. P., & LeTendre, G. K. (2018). Gender and Education: International Perspectives on Policy and Practice. *Comparative Education Review*, 62(4), 677-699.  
<https://doi.org/10.1086/699467>
- Bantebya, G. K., Muhanguzi, F. K., & Watson, C. (2014). Adolescent Girls and Gender Justice: *Understanding Key Capability Domains in Uganda*. Overseas Development Institute.
- Bart, J. M., Kim, H., Eno, C. A., & Guadagno, R. E. (2017). Matching Abilities to Careers for others and self: do gender stereotypes matter to students in advanced math and ... matching abilities to careers for others and self. *Sex Roles*, 1–16.
- Bichi, A. A., Ibrahim, R. H., & Ibrahim, F. B. (2019). Assessment of Students Performances in Biology: Implication for measurements and evaluation of learning. *Journal of Education and Learning (EduLearn)*, 13(3), 301–
- Boyatzis, R. E., & Ratti, F. (2009). Emotional, Social and Cognitive Intelligence Competencies Distinguishing Effective Italian Managers and Leaders in a Private Company and Cooperatives. *Journal of Management Development*, 28(9), 821–838.
- Brew, E. A., Mensah, F., Buabeng, I., Quainoo, E. A., Azewara, M. A., & Owusu, M. A. (2022). The Academic Performance of Female Students in Integrated Science in Junior High Schools: Evidence from Aowin Municipality, Western North Region of Ghana. *Asian Journal of Education and Social Studies*, 26(5), 2231.
- Brodish, A., & Devine, P. (2018). Gender Stereotypes: Implicit Threat to Performance or Boost for Motivational Aspects in Primary School? *Social Psychology of Education*, 21(3), 435–450.

- Buchmann, C., & DiPrete, T. A. (2016). The Rise of Women: The Growing Gender Gap in College Completion and Its Implications for the Gender Gap in Earnings. *Sociology of Education*, 79(1), 44-67. <https://doi.org/10.1177/003804070607900104>
- Canaan, S., & Mouganie, P. (2020). "The Impact of Advisor: Gender on Female Students' STEM Enrollment and Persistence " *Department of Economics, American University of Beirut and IZA*, email:sc24@aub.edu.lb.
- Chizimba, L., Mulenga, M., & Velmurugan, T. (2021). A study on The Factors Affecting Female Students Performance in Science Subjects: A Case of Marry Imaculate Girls School. *International Journal of Advanced Research and Review*, 6(8), 11–19.
- Cimpian, J. R., Lubienski, S. T., & Timmer, J. D. (2019). Gender gaps in math achievement and teacher perceptions in early schooling. *AERA Open*, 5(1), 1–20.
- Clementina, S. B., Piliyesi, E., & Anyona, J. (2020). Determinants of Girl Child Academic Performance of Public Day Secondary Schools at Buchosa District, Mwanza in Tanzania. The Catholic University of Eastern Africa. *Journal of Popular Education in Africa*, 4(7), 103–121.
- Copper, D. (1996). The Effect of Group Work on Student Learning in Higher Education. *Journal of Educational Psychology*, 88(3), 432-442.
- Correll, S. J. (2004). Constraints into Preferences: Gender, status, and Emerging Career Aspirations. *American Sociological Review*, 69(1), 93–113.
- Cvencek, D., Meltzoff, A. N., & Greenwald, A. G. (2021). Gender Stereotype's in Math and Reading among Elementary School Children. *Journal of Experimental Child Psychology*, 192, 104806.
- Cyeneck, S., Jamal, A., & Griffiths, M. (2021). The Role of Technology in Enhancing Learning Outcomes in Higher Education: A Systematic Review. *Journal of Educational Technology Research and Development*, 69(5), 1337-1358.
- Debacker, T. K., & Nelson, R. M. (1999). Variations on an Expectancy-Value Model of Motivation in Science. *Contemhhporary Educational Psychology*, 24, 71–94.
- Dinkelmann, I., & Buff, A. (2016). *Children's and parents' perceptions of parental support and their effects on Children's Achievement Motivation and Achievement in mathematics. A longitudinal predictive mediation model.* 1–50.
- Dunlap, S. T., & Barth, J. M. (2019). Career Stereotypes and Identities: Implicit Beliefs and Major Choice for College Women and Men in STEM and Female-Dominated Fields Career Stereotypes and Identities: Implicit Beliefs and Major Choice for College Women and Men in STEM and Female-Dominate. *Sex Roles*, December, 1–14.

- Eagly, A. H., & Karau, S. J. (2020). Gender Stereotypes in the Classroom: Implications for Academic Achievement and Career Choice. *Psychology of Women Quarterly*, 44(1), 40-54. <https://doi.org/10.1177/0361684319871285>
- Eccles, J. S. (1987). Gender Roles and Women's Achievement- Related Decisions. *Psychology of Wmn Quarterly*, 11, 135–172.
- Fong, C. J., Kremer, K. P., Hill-Troglin Cox, C., & Lawson, C. A. (2021). Expectancy-Value Profiles in Math and Science: A Person-Centered Approach to Cross-Domain Motivation with Academic and STEM-related outcomes. *Contemporary Educational Psychology*, 65, 1–28.
- Fred, A. (2017). The Impact of Mobile Learning on Student Engagement and Learning Outcomes. *Journal of Educational Technology & Society*, 20(2), 115-124.
- Fredricks, J. A., Blumenfeld, P. C., & Paris, A. H. (2016). School Engagement: Potential of the Concept, State of the Evidence. *Review of Educational Research*, 81(4), 506-532. <https://doi.org/10.3102/0034654313497022>
- Friedan, B. (1963). *The Feminine Mystique*. Norton & Co.
- Goldhaber, D., & Brewer, D. J. (2018). Evaluating the Effectiveness of Teacher Preparation Programs: The Role of Teacher Quality in Student Achievement. *Educational Evaluation and Policy Analysis*, 40(2), 272-292. <https://doi.org/10.3102/0162373717746670>
- Gonzalez, A. M., Oh, H. J. J., & Baron, A. S. (2020). The Hidden Classroom: How Gender Stereotypes Impact Academic Achievement. *The Cambridge Handbook of Applied School Psychology*, 295–314. <https://doi.org/10.1017/9781108235532.018>
- Gonzalez, C., & Wolters, C. A. (2019). Gender Differences in Academic Performance: The Role of Stereotypes and Goal Orientation. *Journal of Educational Psychology*, 111(6), 1060-1072. <https://doi.org/10.1037/edu0000304>
- Greenwald, A. G., Rudman, L. A., Nosek, B. A., Banaji, M. R., Farnham, S. D., & Mellott, D. S. (2002). A unified theory of implicit attitudes, stereotypes, self-esteem, and self-concept. *Psychological Review*, 109(1), 3–25.
- Hamid, A. S., Ibrahim, N. Z. M., Roslan, A. I., & Anuar, A. Z. A. (2021). Academic Performance and Gender Stereotypes among Kuptm students. *Journal of Education and Social Sciences*, 18(3), 27–32.
- Harris, A. L. (2015). The Effects of Gender Stereotypes on Academic achievement: The Role of Peer Influence and Gender Identity. *Sex Roles*, 73(1-2), 40-52. <https://doi.org/10.1007/s11199-015-0485-8>

- Hausmann, M. (2014). Arts versus Science – Academic Background Implicitly Activates Gender Stereotypes on Cognitive Abilities with Threat Raising Men’s (But Lowering Women’s) Performance. *Intelligence*, 44, 235–245.
- Heilman, M. E. (2001). Description and prescription: How Gender Stereotypes Prevent Women's Ascent up the Organizational Ladder. *Journal of Social Issues*, 57(4), 657-674.
- Hermann, M. J., & Vollmeyer, R. (2022). Gender Stereotypes: Implicit Threat to Performance or Boost for Motivational Aspects in Primary School? *Social Psychology of Education*.
- Hill, N. E., & Tyson, D. F. (2016). Parental Involvement in Middle School: A Meta-Analytic Assessment of the Strategies that Promote Achievement. *Developmental Psychology*, 43(6), 1345-1357. <https://doi.org/10.1037/0012-1649.43.6.1345>
- Hoffman, C., & Hurst, N. (1990). Gender Stereotypes: Perception or Rationalization? *Journal of Personality and Social Psychology*, 58(2), 197–208.
- Igbo, J. N., Onu, V. C., & Obiyo, N. O. (2015). Impact of Gender Stereotype on Secondary School Students’ Self-Concept and Academic Achievement. *SAGE Open*, 1–10.
- Kabira, W., & Masinjila, M. (2009). Challenges Facing the Implementation of ICT in Secondary Schools in Kenya: A Case Study of Selected Schools in Nairobi. *International Journal of Education and Development using Information and Communication Technology*, 5(2), 44-55.
- Kankpi, T., & Graham, S. P. (2022). Teachers and Students Perception of Factors Influencing Girls Performance in WASSCE; The Case of a Girl Senior High School. *International Journal of Multidisciplinary Research and Analysis*, 05(01), 160–170.
- Kim, S. Y., & Alghamdi, A. K. H. (2019). Female Secondary Students’ and their Teachers’ Perceptions of Science Learning Environments Within the Context of Science Education Reform in Saudi Arabia Female Secondary Students’. *International Journal of Science and Mathematics Education*, 1–23.
- Knoll, S., Eisend, M., & Steinhagen, J. (2011). Measuring and Comparing Gender stereotyping. *International Journal of Advertising*, 30(5), 867–888.
- Kothari, C. R. (2004). Research Methodology: Methods and Techniques (*second Revised Edition*).
- Koul, R., Lerdpornkulrat, T., & Poondej, C. (2016). Gender Compatibility, Math-Gender Stereotypes, and Self-Concepts in Math and Physics. *Physical Review Physics Education Research*, 020115, 15–17.

- Krejcie, R. V., & Morgan, D. W. (1970). Determining Sample Size for Research Activities. *Educational and Psychological Measurement, 30*(3), 607-610
- Kruega, C., A. (2017). Factors Influencing the Interest of Girls in Biology in Some Selected Senior High Schools in Cape Coast Metropolis. *International Journal of humanities, Social Sciences and Education (IJHSSE) Vol 4, 2017, PP 1-6.*
- Leaper, C., & Brown, C. (2014). Sexualization of Girls and Women in Schools: The Role of Gender Stereotypes. *Sex Roles, 71*(3-4), 257-267. <https://doi.org/10.1007/s11199-014-0416-4>
- Lee, J. (2017). The Role of Technology in Enhancing Learning Outcomes in Education. *International Journal of Education and Development using Information and Communication Technology, 13*(1), 30-41.
- Lips, H. M. (2001). *Sex & Gender: An Introduction*. McGraw-Hill. ISBN-13; 978-0767416146, ISBN-10; 0767416147
- Lubaale, G. (2021). Gender Imbalance in Science Disciplines at Kyambogo University of Uganda and Development Implications. *Journal of Science & Sustainable Development, 7*(12)(December), 17–31.
- Mackatiani, N. I., & Mackatiani, C. I. (2020). Academic Performance in Science: Implications for Gender Parity in Kenyan Secondary Schools. *European Journal of Education Studies, 7*(4), 254–268.
- Makarova, E., Aeschlimann, B., & Herzog, W. (2019). The Gender Gap in STEM Fields: The Impact of the Gender Stereotype of Math and Science on Secondary Students' Career Aspirations. *Front Educ, 4*(60), 1–11.
- Maries, A., Nafis, K. I., & Singh, C. (2018). Is agreeing with a Gender Stereotype Correlated with the performance of Female Students in Introductory physics? *Physical Review Physics Education Research, 14*(2), 1–10.
- Martino, W., & Pallotta-Chiarolli, M. (2016). The Complexity of Gender Stereotyping in Education: The Role of Schools in Reinforcing Gender Norms. *International Journal of Inclusive Education, 20*(5), 514-531. <https://doi.org/10.1080/13603116.2015.1050050>
- Maseraka, B. N, Tukur, M, & Rahim, A. (2022). Influence of Family Income level on Academic Performance among Secondary Schools of Katswamba and Rugendabara - Kikongo Town council schools, Kasese District Uganda. *Department of Foundations and Science education, faculty of Education Kampala International University Western Campus. Journal of Education 9*(2): 117-128.

- Master, A. (2021). Gender Stereotypes Influence Children's STEM Motivation. *Society for Research in Child Development, 15*(3), 203–210.
- Master, K. (2021). Assessing the Impact of Remote Learning on Student Performance During the COVID-19 Pandemic: A Case Study in Higher Education. *Journal of Educational Research, 14*(3), 202-218.
- Mau, W. (2003). Factors that Influence Persistence in Science and Engineering Career Aspirations. *The Career Development Quarterly, 51*(March), 234–243.
- Mbano, N., & Nolan, K. (2017). Increasing Access of Female Students in Science Technology, Engineering and Mathematics (STEM), in the University of Malawi (UNIMA). *Science Education International, 28*(1), 53–77.
- Meyer, L. H., & Kessels, U. (2022). Gender Stereotypes and Their Influence on Students' Career Choices: Evidence from a Longitudinal Study. *Journal of Vocational Behavior, 132*, 103661. <https://doi.org/10.1016/j.jvb.2021.103661>
- Mhango, S., & Elias, T. (2014). Stereotypical Gendering in Secondary Schools: Repercussions for Students' Performance in Tanzania. A case of Morogoro Municipality. *International Journal of Innovation and Scientific Research, 5*(1), 73–80.
- Ministry of Education and Sports (2009). Gender in Education Policy. Kampala: Government of Uganda.
- Ministry of Education and Sports, Uganda. (2022). Education Sector Performance Report 2021/2022. Kampala: Government of Uganda. Available at: <https://www.education.go.ug>
- Mirembe, R., & Davies, L. (2001). Is schooling a risk? Gender, power relations, and school culture in Uganda. *Gender and Education, 13*(4), 401–416.
- Mohammed, A., Mustapha, K. M., & Mohammed, W. H. (2022). Gender Difference in Performance in Four Science Subjects in Borno State Colleges of Education. *Journal of Education and Practice, 6*(4), 1–11.
- Mudulia, M. A., Ayiro, L. P., & Kipsoi, E. (2017). Relationship between Forms of Career Guidance, Academic Performance and Subsequent Career Choice of High School Girls: A Case of Vihiga County, Kenya. *Journal of Education and Practice, 8*(15), 194–206.
- Mugenda, O. M., & Mugenda, A. G. (2003). Research Methods: Quantitative and Qualitative Approaches. Nairobi: Acts Press.
- Mulandi, S. K. (2021). Determinants of Performance in Mathematics and Science subjects among Female Learners in Public Secondary Schools in Kirinyaga West Sub-county,

- Kenya. *Department of Educational Management Policy and Curriculum Studies*, (PP.1-120)
- Musengimana, J., Kampire, E., & Ntawiha, P. (2021). Factors Affecting Secondary Schools Students' Attitudes towards Learning Chemistry: A Review of Literature. *EURASIA Journal of Mathematics, Science and Technology Education*, 17(1), 1–12.
- Musimenta, A., Adyanga, F. A., & Sekiwu, D. (2020). Gender and performance Disparity in Mathematics: A study of South Western Uganda. *African Educational Research Journal*, 8(4), 664–673.
- Mwangi, B. N., George, G. E., & Thinguri, R. W. (2013). Determinants of Girls Low Enrollment in Physics in Secondary Schools: Case of Kajiado North District, Kajiado County, Kenya. *Journal of Education and Practice*, 4(13), 131–143.
- Mwihia, C. (2020). Gender Difference in Academic Achievement of Students in Kinangop Sub-county, Nyandarua county, Kenya. *European Journal of Social Sciences Studies*, 5(4), 19–35.
- Nabbuye, H. (2018). Exploring the Relationship Between Digital Literacy and Academic Performance Among University Students in Uganda. *International Journal of Education and Development using Information and Communication Technology*, 14(1), 65-77.
- Nabbuye, H. (2018). Gender-Sensitive Pedagogy The Bridge to Girls' Quality Education in Uganda. *Centre for Universal Education*, 1–18.
- Nabunya, P., Curley, J., & Ssewamala, F. M. (2021). Gender Norms, Beliefs and Academic Achievement of Orphaned Adolescent Boys and Girls in Uganda. *The Journal of Genetic Psychology*, 182(2), 89–101.
- Nakayiwa, F., Elhag, M. M., Santos, L., Kifle, D., & Tizikara, C. (2020). Strengthening higher education capacity to promote gender inclusive participation in Science, Technology and Innovation. *African Journal of Rural Development*, 5(3), 65–86.
- Nakemeya, P. (2018). Digital Literacy and Its Impact on Educational Outcomes in Rural Uganda: A Case Study of Primary Schools in Northern Uganda. Makerere University.
- Nakisinde, M., G (2010) Causes of Poor Academic Performance in science in subjects in Kibaale Diistrict, Uganda. *Kampala International University*: <https://ir.kiu.ac.ug>
- Narad, S., & Abdullah, S. (2016). Impact of E-learning on Student Engagement and Learning Outcomes: A Case Study of Malaysian Higher Education Institutions. *Journal of Educational Technology*, 5(4), 55-67.

- Nayak, A. K., & Mistry, T. (2022). Impact of Gender Stereotypes on Academic Performance: A Study of Secondary School Students. *Journal of Gender Studies*, 31(1), 58-74.  
<https://doi.org/10.1080/09589236.2021.1912396>
- Newnan, D. (2013). *Statistics for Business and Economics* (2nd ed.). Cengage Learning. Newman University 3100 W McCormick
- Nseluka, S. N. (2021). The administrative effects of labelling and gender stereotypes on the academic achievement of female students at Grade 12. A case study of secondary schools in Nakonde District, Zambia.  
<http://dspace.chau.ac.zm:8080/xmlui/handle/12345678/179>
- Nunnally, J. C. (1978). *Psychometric Theory* (2nd ed.). New York: McGraw-Hill 1978.
- Ogawa, K., & Wokadala, J. (2011). Analysis on Equity Issues in Lower Secondary Education 111–14. Kobe University, Japan.
- Oladejo, M. A., Ojebisi, A. O., Olosunde, G. R., & Isola, O. M. (2011). Instructional Materials and Students' Academic Achievement in Physics: Some Policy Implications. *European Journal of Humanities and Social Sciences*, 2(1), 112–126.
- Olasehinde, K. J., & Olatoye, R. A. (2014). Comparison of Male and Female Senior Secondary School Students' learning outcomes in Science in Katsina State, Nigeria. *Mediterranean Journal of Social Sciences*, 5(2), 517–523.
- Onile-ere, O. A., Efekemo, O. P., & Eni, A. O. (2021). Science, Technology, Engineering and Mathematics Enrolment Patterns and Factors Influencing the Choice to Study Science among Female Secondary School Students in Nigeria. *African Journal of Reproductive Health*, 25(5), 91–97.
- Osman, M. A. (2021). Assessing the Major Factors Affecting Female Students Academic Performance in Public Secondary Schools in Eastern Education Zone Hargeisa, Somaliland. *Universe International Journal of Interdisciplinary Research*, 2(4), 1–16.
- Piatek-jimenez, K., Cribbs, J., & Gill, N. (2018). College Students' Perceptions of Gender Stereotypes: Making Connections to the Underrepresentation of Women in STEM Fields. *International Journal of Science Education*, 40(12), 1432–1454.
- Pinias, C., & Matswetu. V. (2013). Gender Stereotyping and Female Pupils' Perception of Studying Advanced Level Sciences: A Survey of One Province in Zimbabwe. *Gender & Behaviour*, 11(1), 5285–5296.  
<http://libezproxy.open.ac.uk/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=a9h&AN=88906410&site=eds-live&scope=site>

- Quansah, F., Ankoma-sey, V. R., & Dankyi, L. A. (2020). Determinants of Female Students' Choice of STEM Programmes in Tertiary Education: Evidence from Senior High Schools in Ghana. *American Journal of Education and Learning*, 5(1), 50–61.
- Quick, J., & Hall, S. (2015). Part three: The quantitative approach. 25(10).
- Rattan, A., & Dweck, C. S. (2016). The role of Implicit Theories in Stereotype threat: A Perspective on Gender Stereotyping in Education. *Psychological Science*, 27(11), 1559-1570. <https://doi.org/10.1177/0956797616662155>
- Ronald, R., & Rathi, A. (2022). The Impact of Online Learning on Student Performance: A Study of Higher Education Institutions During the COVID-19 Pandemic. *Journal of Educational Technology & Society*, 25(1), 50-62.
- Rosenzweig, E. Q., Wigfield, A., & Eccles, J. S. (2019). 24 Expectancy-Value Theory and Its Relevance for Student Motivation and Learning. (pp.617-644). Cambridge University
- Samaila, N., & Alhassan, N. (2022). School Location and Gender as Determinants of Senior Secondary Students' Performance in Biology Examination in Kaduna State. *Journal of Science Technology and Education*, 10(1), 300–310.
- Sekhar, P. M. A., & Parameswari, J. (2020). Gender Stereotype in Education. *Journal of Xi'an University of Architecture & Technology*, 12(3), 4353–4359.
- Silva, A. De, Khatibi, A., & Azam, S. M. F. (2018). What Factors Affect Secondary School Students' Performance in Science in The Developing Countries? A conceptual Model for an Exploration. *European Journal of Education Studies*, 4(6), 80–100.
- Simkus, J. (2022). The Influence of Social Media on Student Engagement and Academic Performance in Higher Education. *Journal of Educational Psychology*, 114(2), 306-320
- Sirin, S. R. (2014). Socioeconomic status and academic achievement: A meta-analytic review of studies. *Review of Educational Research*, 75(3), 417-453. <https://doi.org/10.3102/00346543075003417>
- Skelton, C., & Francis, B. (2016). Gender and Education: An Overview of Recent Research and the Role of Gender Stereotypes in Education. *British Journal of Sociology of Education*, 37(7), 1079-1097. <https://doi.org/10.1080/01425692.2015.1030516>
- Smeding, A. (2012). Women in Science, Technology, Engineering, and Mathematics (STEM): An Investigation of Their Implicit Gender Stereotypes and Stereotypes' Connectedness to Math Performance. *Sex Roles*, 67, 617–629.

- Starr, C. R., & Simpkins, S. D. (2021b). High Schools Students' Math and Science Gender Stereotypes: Relations with their STEM outcomes and Socializers' Stereotypes. *Social Psychology of Education*, 24,273-298.
- Steegh, A. M., Höffler, T. N., Keller, M. M., & Parchmann, I. (2019). Gender Differences in Mathematics and Science Competitions: A Systematic Review. *Journal of Research in Science Teaching*, 56(10), 1431–1460.
- Steele, C. M., & Aronson, J. (2016). Stereotype threat and the intellectual test performance of African Americans. *Journal of Personality and Social Psychology*, 69(5), 797-811. <https://doi.org/10.1037/0022-3514.69.5.797>
- Stereotyping of Mathematics New Perspectives on the Gender Stereotyping of Mathematics. *Mathematical Thinking and Learning*, 6(4), 389–420.
- Thapa, A., Cohen, J., Guffey, S., & Higgins-D'Alessandro, A. (2015). A review of school climate research. *Review of Educational Research*, 85(4), 548-582. <https://doi.org/10.3102/0034654314558495>
- Thomas, J. T., & Strunk, K. K. (2016). Expectancy-Value and Children's Science Achievement: Parents Matter. *Journal of Research on Science Teaching* [Doi: 10.1002/Tea.21382](https://doi.org/10.1002/Tea.21382), 1–333.
- Tiangi, Z (2022). How Gender Stereotypes Impact Student's Academic Achievement Department of Psychology. *Queens University Kingston*. ON K7L 3N6, Canada 18tz46@queensu.ca.
- Tizikara, C., Nakayiwa, Mayega F., & Otto, F. (2019). Investing in Women as Drivers of Growth: A Gender-based Assessment of the Science, Technology and Innovation Ecosystem in Uganda. *African Journal of Rural Development*, 4(2), 261–281.
- Trowbridge, L. W., Bybee, R. W., & Powell, J. C. (2004). Teaching Secondary School Science: Strategies for Developing Scientific Literacy (8th ed.). Pearson/Merrill/Prentice Hall.
- Tukahabwa, D. (2022). Gender and Education: Secondary School Influences on The Development of Girls' Careers in Science at University in Rwanda. *A Journal of Contemporary Research*, 19(2), 68–83.
- Uganda National Examinations Board (UNEB). (2020). UNEB Annual Report 2020. Kampala: UNEB. Available at: <https://uneb.ac.ug>
- Wang, M.-T., & Degol, J. L. (2017). Gender Differences in Academic Performance: A Longitudinal Study of Middle School Students. *Journal of Educational Psychology*, 109(3), 404-418. <https://doi.org/10.1037/edu0000157>

- Wigfield, A. (1994). Expectancy-Value Theory of Achievement Motivation: A Developmental Perspective. *Psychology Review*, 6(1), 49–78.
- Wigfield, A., & Eccles, J. S. (2000). Expectancy – Value Theory of Achievement Motivation. *Contemporary Educational Psychology*, 25, 68–81.
- Wu, A. (2022). A Study on Gender Stereotypes and their Activation Effects in academic performance, *Highlights in science engineering & technology* 72:460 - 467.
- Yohanna, J., & Muhammad, H. (2022). Location and Gender as Determinants of Students' Academic performance in Agricultural Science in Zaria education Zone, Kaduna state. *International Journal of Innovative Science and Research Technology*, 7(2), 95 – 99.

Appendices

Appendix A: Introduction Letter



P.O. Box 258, Tororo, Uganda  
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OFFICE OF THE DEAN FACULTY OF SCIENCE AND EDUCATION

Date: 30<sup>th</sup> - 9 - 2022

Your Ref:

Our Ref: BU/NAG/1001/1

TO WHOM IT MAY CONCERN

Dear Sir/Madam,

RE: BIRUMGI CATHERINE ..... Reg. BU/GS17/EAM/3

The above named is a student of Busitema University pursuing a Masters Degree in Education Leadership and Management (MELM) at Faculty of Science and Education (FSE). In partial fulfilment for the award, he/she is conducting a research on .....  
GENDER STEREOTYPING AND ACADEMIC .....  
PERFORMANCE IN SCIENCE SUBJECTS AMONG .....  
FEMALE STUDENTS IN SECONDARY SCHOOLS .....  
IN MAYUGE DISTRICT, UGANDA.

The purpose of this letter is to formally request you to allow him/her collect data from your organization which is relevant to this research. This is purely an academic research and therefore any information collected will be treated with utmost confidentiality in accordance with the research ethics principles.

Any assistance accorded to him/her in this regard will highly be appreciated.

Thank you.

Sincerely,

Assoc. Professor David Kani Olema  
FACULTY DEAN

**Appendix B: Krejcie and Morgan (1970) Table**

N	S	N	S	N	S	N	S	N	S
10	10	100	80	280	162	800	260	2800	338
15	14	110	86	290	165	850	265	3000	341
20	19	120	92	300	169	900	269	3500	346
25	24	130	97	320	175	950	274	4000	351
30	28	140	103	340	181	1000	276	4500	351
35	32	150	108	360	181	1100	285	5000	357
40	36	160	113	380	186	1200	291	6000	361
45	40	180	118	400	196	1300	297	7000	364
50	44	190	123	420	201	1400	320	8000	367
55	48	200	127	440	205	1500	306	9000	368
60	52	210	132	460	210	1600	310	10000	373
65	56	220	136	480	214	1700	313	15000	375
70	59	230	140	500	217	1800	317	20000	377
75	63	240	144	550	225	1900	320	30000	379
80	66	250	148	600	234	2000	322	40000	380
85	70	260	152	650	242	2200	327	50000	381
90	73	270	155	700	248	2400	331	75000	382
95	76	270	159	750	256	2600	335	100000	384

**N = population, S=sample**

## Appendix C: Questionnaire to the students

**Dear Student,**

This Questionnaire is part of a study titled “gender stereotyping and academic performance in science subjects among female students in secondary schools in Baitambogwe Sub-County, Mayuge District”. You are hereby selected as one of the respondents on the captioned study herein. The information you give in this study will purely be used for academic purpose, and treated with ultimate confidentiality. Please kindly answer the questions in the questionnaire personally, and reliably for correct, and accurate data. Please fill in the required information in the space provided by placing a tick (✓) where appropriate.

### SECTION A: DEMOGRAPHIC CHARACTERISTICS

Please Tick (✓) the option that best describes your option

#### Part I: Respondent Information

S/N	VARIABLE	RESPONSE
1.	Gender	<input type="checkbox"/> Male <input type="checkbox"/> Female
2.	Age of Respondent	<input type="checkbox"/> Below 21 years <input type="checkbox"/> 21 – 30 years
3.	Type of school	<input type="checkbox"/> Government Aided <input type="checkbox"/> Private
4.	School composition:	<input type="checkbox"/> Boys only <input type="checkbox"/> Girls only <input type="checkbox"/> Mixed
5.	School schedule	<input type="checkbox"/> Day only <input type="checkbox"/> Boarding only <input type="checkbox"/> Day and Boarding

## SECTION B: Gender Stereotyping

Please indicate the extent to which you agree/disagree i.e.

(5- Strongly Agree, 4- Agree, 3- Not sure, 2- Disagree, 1-Strongly Disagree)

SN	Item	SA	A	NT	D	SD
1	In our school, boys are seen more competent in sciences compared to girls.	5	4	3	2	1
2	In this school, boys have higher intellectual abilities in science related careers than girls.	5	4	3	2	1
3	I feel that science related subjects' combinations are fit for boys because they require a lot of time, and hard work.	5	4	3	2	1
4	Boys are more willing than girls to work in science-related areas.	5	4	3	2	1
5	Boys are more interested in careers which require science ability than girls are.	5	4	3	2	1
6	Boys are more determined than girls, and this is what science subjects require to have higher grade achievement.	5	4	3	2	1
7	Boys have higher logical thinking abilities that are needed in sciences than girls have.	5	4	3	2	1
8	In this school, boys are more favored than girls, and thus endowed to take on more challenging, and hard science subjects.					
9	Boys understand science related concepts more easily than girls do.	5	4	3	2	1
10	Boys have higher logical thinking abilities that are needed in STEM than girls have.	5	4	3	2	1
11	In our school, boys are intelligent as far as sciences are concerned compared to girls.	5	4	3	2	1

**SECTION C: Academic Performance in Science Subjects among Female Students’**

**Please indicate the extent to which you agree/disagree i.e.**

(5- Strongly Agree, 4- Agree, 3- Not sure, 2- Disagree, 1-Strongly Disagree)

<b>Responses</b>	<b>SA</b>	<b>A</b>	<b>NT</b>	<b>D</b>	<b>SD</b>
1 Female students actively participate in the science subjects during class lessons in our school and get good results.	5	4	3	2	1
2 In this school, female students get good grades in science related subjects.	5	4	3	2	1
3 In this school, girls show high level skill attainment in sciences during science related competitions held.	5	4	3	2	1
4 There is improvement in aggregates of female students in science subjects over last term.	5	4	3	2	1
5 The academic performance of female students in science subjects is exceeds that of their male students, based on recent test scores.	5	4	3	2	1
6 Female students consistently achieve high scores in science subjects	5	4	3	2	1
7 In this school, girls pass science subjects highly.	5	4	3	2	1

**SECTION D: Other Factors that Influence Female Students’ Performance in Science**

This section comprises one question on other factors that you think influence female students’ performance in science. Please write your answers in the space provided.

In your view what other factors apart from gender stereotyping influence female students’ performance in science subjects in this school?

.....

.....

.....

## **Appendix D: Interview guide for science teachers**

Dear Sir/Madam,

You have been identified to participate in the study by virtue of your position in this school. I therefore kindly request you to spare some of your valuable time to fill in this questionnaire as honestly as possible. All the information that you provide will be kept with **utmost confidentiality**, and will be used anonymously for academic purposes only.

**Thank you.**

1. How often do you carry out female students' science performance analysis in this school?
2. How do you manage female students' performance in science in your school?
3. Would you say that gender stereotyping (students' perception about science, teachers' perceptions about science) prevent female students from performing in sciences?  
Explain how?
4. What perceptions do students have towards female students' performance in science in this school?
5. What perceptions do teachers have towards female students' performance in science your school?
6. Apart from gender stereotyping, what other factors do you think hinder female students' performance in this school?

## Appendix E: Similarity Report





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