

**Becoming Women ‘Scientists’: Negotiating
Gendered Constructions of Science at University in
Rwanda**

By

Dorothy Tukahabwa

Canterbury Christ Church University

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Abstract

This study focuses on the experiences of young women pursuing careers in science disciplines at the University of Rwanda. It explores the gendered constructions of science and how young women negotiate these constructions to study science subjects at university. Traditionally, sciences are male-dominated subjects and continue to be an area where women are a minority. This thesis argues that the underrepresentation of women in science disciplines within higher education from the Rwandan context is largely due to the social roles expected of women as mothers and caretakers, which has led to them being less likely to take a science degree. Although studies on the underrepresentation of women in science have proliferated, there is still inadequate research on women's experiences of the lives they encounter while studying science subjects at university. Moreover, an investigation of these experiences leads to an understanding of the gendered construction of these subjects from within the Rwandan context. By employing a qualitative research methodology underlined with a feminist and case study approach, the study explores the experiences of women pursuing careers in science subjects. The researcher shares the experiences of these young women using research tools including interviews, reflective diaries and analysis of documents. As this study demonstrates, an individual's family background, domestic roles, community expectations and schooling experiences at primary school, secondary school and university, among other factors, have a significant influence on young women's decisions to study science disciplines at university. Moreover, instead of the young women continuing to see themselves as people who are unfit to study the subjects that tend to be constructed in masculine terms, the young women included in this research have pursued careers in science and subverted these constructions. This thesis also argues that the policy adopted by the post-genocide government to encourage the recruitment of women in positions of power has played a role in motivating young women to reconceptualise themselves and engage with roles for which they would previously have been considered incapable of. This study may act as a springboard for similar studies elsewhere in terms of investigating conditions under which women study traditionally male-dominated subjects. Furthermore, this study can offer insights on how the Government of Rwanda could pursue issues of affirmative action, to enable more young women to enrol on science degrees at tertiary education level.

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Dedication

To my lovely son Ethan Johns Nsamaza for inspiring me to write this thesis.

List of Acronyms

AU	African Union
AVEGA	Association des Veuves du Génocide Agahozo
BBC	British Broadcasting Corporation
BRD	Development Bank of Rwanda
CCCU	Canterbury Christ Church University
DeIPHE	Development Partnership for Higher Education
DFID	Department for International Development
DRC	Democratic Republic of Congo
EAC	East African Community
EDPRS	Economic Development and Poverty Reduction Strategy
EFA	Education for All
ESD	Education for Sustainable Development
ESSP	Educational Sector Strategic Plan
FARG	Genocide Survivors Assistance Fund
FAWE	Forum for African Women Educationalists
GDP	Gross Domestic Product
GER	Gross Enrolment Rate
GLR	Great Lakes Region
GoR	Government of Rwanda
GTZ	German Technical Cooperation
HEC	Higher Education Council
HESLD	Higher Education Students Loan Department
ICT	Information and Communication Technologies
ISAE	Institut Supérieur d’Agronomie et d’Élevage
ISFP	Institut Supérieur de Finances Publique
KH1	Kigali Health Institute
KIE	Kigali Institute of Education
KIST	Kigali Institute of Science and Technology
KISTAS	Kigali Institute of Science and Technology Students Association
MDGs	Millennium Development Goals
MIFOTRA	Ministry of Public Service and Labour
MIGEPROF	Ministry of Gender and Family Promotion

MINALOC	Ministry of Local Government
MINECOFIN	Ministry of Finance and Economic Planning
MINEDUC	Ministry of Education
MRes	Master of Research in Education and Social Research Methods
MTN	Mobile Telecommunication Network
NEPAD	New Partnership for African Development
NGO	Non-Governmental Organisation
NISR	National Institute of Statistics of Rwanda
PES	Poverty Eradication Strategy
PTA	Parents Teachers Association
RBS	Rwanda Bureau of Standards
RDB	Rwanda Development Board
REB	Rwanda Education Board
RGB	Rwanda Governance Board
RPF	Rwanda Patriotic Front
RWF	Rwandan Franc
SFAR	Students Financing Agency for Rwanda
SIDA	Swedish International Development Aid
SWAP	Sector Wide Approach
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNICEF	United Nations International Children’s Educational Fund
URCAVM	University of Rwanda’s College of Agriculture, Animal Sciences and Veterinary Medicine
URCE	University of Rwanda’s College of Education
URCST	University of Rwanda’s College of Science and Technology

Table of Contents

Abstract	i
Acknowledgement	ii
Dedication	iv
List of Acronyms	v
Table of Contents	vii
List of Figures	xi
Chapter One	1
General Introduction	1
1.1 Personal and Educational Influences on my Study	1
1.2 Statement of Issues	4
1.3 Objectives of the Study	5
1.3.1 Main Objective.....	5
1.3.2 Specific Objectives	5
1.4 Research Question	5
1.4.1 Main Research Question	5
1.4.2 Specific Research Questions.....	6
1.5 Thesis Structure	6
Chapter Two	9
Literature Review	9
2.1 Introduction.....	9
2.2 Studies on Women in Science: The Rwandan Context	9
2.3 Studies on Women in Science: The African Context	14
2.4 Negotiating Gendered Constructions of Science: A Global Perspective.....	17
2.5 Conclusion	22
Chapter Three	23
Background to Gender and Education in Rwanda	23
3.1 Introduction.....	23
3.2 Geographical Location and Economic Context of Rwanda.....	24
3.2.1 Geographical Location.....	24
3.2.2 Economic Context.....	25
3.3 Education and Gender in Pre-colonial Rwanda	26

3.4 Education and Gender in Colonial Rwanda.....	28
3.5 Education and Gender in Post-Colonial Rwanda.....	30
3.6 Education and Gender in Post-Genocide Rwanda: Efforts in Addressing Gender Disparities from Primary to Tertiary Levels.....	31
3.6.1 Access to Primary Education.....	34
3.6.2 Secondary Education.....	37
3.6.3 The Situation in Tertiary Education.....	38
3.7 Conclusion.....	42
Chapter Four.....	44
Research Methodology.....	44
4.1 Introduction.....	44
4.2 Qualitative Research Methodology.....	44
4.3 Feminist Research.....	45
4.4 An Interpretivist Case Study Approach.....	48
4.5 Scope of the Study.....	50
4.6.1 Gaining Access to the University and the Participants.....	54
4.6.2 First Phase of the Study.....	54
4.6.3 Main Phase of the Study.....	55
4.7 Sampling Procedures.....	56
4.8 Methods of Data Collection.....	60
4.8.1 Interviews.....	60
4.8.2 Documents.....	63
4.8.3 Use of a Diary (personal document).....	63
4.9 Ethical Considerations.....	66
4.10 Insider/Outsider Research: Negotiating Different Selves and other Challenges during Fieldwork.....	67
4.11 Data Analysis.....	72
4.12 Conclusion.....	75
Chapter Five.....	76
Biography of the Research Participants.....	76
5.1 Introduction.....	76
5.2 Brenda.....	76
5.3 Nelly.....	77

5.4 Janet	78
5.5 Claudine	79
5.6 Belinda	81
5.7 Judith.....	82
5.8 Christine.....	83
5.9 George.....	84
5.10 Eric.....	84
5.11 David.....	85
5.12 Paul	86
5.13 John.....	86
5.14 Peter	87
5.15 Conclusion	88
Chapter Six.....	89
Gendering Science Subjects at University in Rwanda: Family Background and Educational Contexts.....	89
6.1 Introduction.....	89
6.2 Family Background.....	90
6.2.1 Parental Education	91
6.2.2 Parental Income	96
6.2.3 Family Structure: Single Parenthood, Monogamy and Polygamy.....	102
6.2.4 Domestic Responsibilities.....	104
6.2.5 Community Expectations.....	107
6.3 School as a Space for Gendering Science.....	111
6.3.1 Enrolment at School: From Primary to Secondary	113
6.3.2 Starting Primary School.....	113
6.3.3 Transition from Primary to Secondary School	115
6.4 University as Space for Concretising Gendered Constructions of Science	121
6.4.1 Admission Policies.....	122
6.4.2 Funding Opportunities for Boys and Girls.....	124
6.4.3 From Teaching to Assessing Students	128
6.5 Conclusion	130
Chapter Seven	132
Women ‘Scientists’ at University: Challenging Gendered Constructions in Rwanda..	132

7.1 Introduction.....	132
7.2 Science as Subversion of Femininity	133
7.3 Career Development as Opposed to Marrying and Creating a Family	149
7.4 Government Policies and Bursaries	157
7.5 Conclusion	165
Chapter Eight.....	167
Summary, Conclusions and Recommendations	167
8.1 Introduction.....	167
8.2 Summary of the Study	167
8.3 Limitations of the Study.....	169
8.4 Conclusions.....	171
8.5 Areas for Future Research	173
References.....	175
Appendices.....	192
Appendix 1: Identity of the Participants	192
Appendix 2: Participant Consent Forms	193
Appendix 3: Sample Interview Guide.....	197
Appendix 4: Ethical Approval from CCCU.....	199
Appendix 5: Letter of Affiliation to the University of Rwanda.....	200
Appendix 6: Letter of Nomination for the Contact Person at the University	202
Appendix 7: Letter of Authorisation from Ministry of Education to Conduct Research	203
Appendix 8: Letter of Authorisation from Ministry of Education (including names of contact person with copy to the Minister of Education).....	204
Appendix 9: Letter to Introduce the Researcher to the University	205

List of Figures

Figure 1 : Location of the University of Rwanda’s College of Science and Technology	50
Figure 2: A Sample of Diaries Written by my Participants during Fieldwork	65

Chapter One

General Introduction

1.1 Personal and Educational Influences on my Study

My interest in investigating the experiences of young women studying science degrees at higher institutions of learning in Rwanda began when I took up a post as a research assistant on a study of young women involved in science and technology in tertiary¹ institutions in Rwanda. I had just completed my undergraduate studies and, just like any female graduate fresh from university, I had no idea of what career to pursue because the majority of women in Rwanda who finish school are expected to take on what is seen as traditional feminine roles, such as being a wife and having children. Given that I had majored in history and religious studies with education while at university, the obvious option for me at that moment was to find something in teaching (in particular at high school). As I was looking for opportunities, I was recruited onto the DelPHE²- Girls into Science and Technology project, led by the University of Rwanda's College of Education (URCE) (formerly the Kigali Institute of Education). The project aimed to identify the barriers to girls' participation in science and technology, with the research covering different levels of the education sector in Rwanda: primary, secondary, and higher education.³

As a research assistant on this project, my tasks were to review the literature related to women studying science and technology, and to conduct research in primary and secondary schools and higher institutions of learning regarding the barriers for young women in science and technology education, as well as organise workshops for teachers and policy makers and disseminate the research findings. As I carried out these tasks, many issues concerning women were revealed to me, especially the ways in which they struggle and negotiate various socio-cultural issues in society. Indeed, as a young woman who had lived and been socialised under such conditions, the question that often came to my mind, even before receiving the

¹ In this study, I use the terms 'tertiary' and 'higher' institutions interchangeably to refer to post-secondary institutions including universities and colleges where someone goes to pursue diploma, degree and other postgraduate programmes.

² DelPHE stands for the Development Partnership in Higher Education, a project that was financed by the British Council between 2007 and 2010. For more details on DelPHE, see Chapters 3 and 7.

³ See Pamela Abbott, Dorothy Tukahabwa, Jean Providence Nzabonimpa and Roger Sapsford (2010) in their work 'Girls into Science and Technology: Policy Brief', available at www.academia.edu.

preliminary results from the DelPHE-Girls into Science and Technology project, was: ‘Given that young women are perceived as being ‘inferior’ in certain societies, how do they negotiate their gendered identities to pursue their ambitions in education?’. To investigate this question, I thought it would be interesting to listen to testimonies from young women studying science at a university in Rwanda.

This fascination with understanding young women’s determination to take science and technology courses also formed the basis of my Master of Research in Education and Social Research Methods (MRes) dissertation (2007–2009),⁴ in which I explored the influences for young women’s choices to study science and technology courses at university (Tukahabwa, 2011).⁵ Indeed, the journey of a young woman pursuing a science career at university is marred by what I call ‘out-of-school’ and ‘in-school’ factors. One of the key factors that young women pursuing science careers in tertiary institutions grapple with is home pressures, which often leads to their early withdrawal from school as there is a significant expectation on them to help with the household chores (Asimeng-Boahene, 2006; Huggins and Randell, 2007; Nyangena, 2008). As Tamale (2004) has also pointed out, girls learn to equate their femaleness with domesticity⁶ from an early age and generally do not question their given social roles. In this sense, such gender role stereotyping can have a very negative impact on women as it puts significant pressure on them to abandon any aspirations, they may have that do not fit with a gendered, child rearing expectation (Odaga and Heneveld, 1995).

⁴ Female students on a special empowerment programme were recruited as participants for my MRes study because they were committed to pursuing a degree in science even though they did not have the requisite grades to be admitted into a university. In 2006, there were about 200 girls enrolled on a special women’s empowerment programme that recruited young women who had narrowly failed to gain admission into university. Through intensive residential training, the young women were helped to re-sit the entrance examinations for higher education in order to undertake advanced studies in science and technology. Among the 200 girls enrolled on the programme, 93 joined the University of Rwanda’s College of Science and Technology. With this single intervention, some programmes increased the proportion of women enrolled in subjects such as biology, chemistry, and food science, with a few of them being admitted to engineering courses. For a more detailed analysis, see Huggins and Randell (2007).

⁵ This article, summarising the research findings of my MRes study, was published as part of the proceedings of a postgraduate conference I attended at the University of Aberdeen in the UK in 2009.

⁶ Domesticity literally denotes the state of being at home and taking care of one’s family. In her work, Tamale (2004) notes that the concept of domesticity relates to one becoming a mother, wife, and caretaker, which is culturally constructed and closely linked to patriarchy, gender, and the private/public distinction. In Rwanda, different proverbs abound that mirror such an idea of domesticity. An example of such a proverb is, *icyubahiro cyu umugore ntu ugushingirwa*, meaning that a woman’s principle dignity comes from marriage (see also the introduction to Uvuza, 2014).

Although the notions of gender roles and early socialisation influence the choices of study for young women,⁷ this is not enough to explain the reasons for women's underrepresentation in science courses. Since the Rwanda Patriotic Front (RPF) took power in 1994, it has made enormous strides in promoting gender equality.⁸ Based on the fact that the number of women in Rwanda's parliament has increased significantly (Debusscher and Ansoms, 2013), women are participating in national politics and are being recommended for high-level political positions much more than in previous regimes (see Powley, 2005; Longman, 2006; Burnet, 2008; Devlin and Elgie, 2008; Uwineza and Pearson, 2009; Debusscher and Ansoms, 2013). In 1994, Rwanda was devastated by a genocide that destroyed almost everything in the country, including the economy, social order, and infrastructure (Abbott et al., 2015). Despite this, the country witnessed more than 50% female representation in parliament in 2003.⁹ In addition, the government mandates equal representation of women in other decision-making bodies. However, is such a situation being played out in the education sector? According to Huggins and Randell, the 'political will for positive discrimination in political representation is clear in Rwanda's 2003 Constitution, but this same political will does not seem to extend to affirmative action in education' (Huggins and Randell, 2007, p.5). It has taken a number of years since the Rwandan constitution was amended in 2003 to raise the percentage of women's enrolment in science degree courses in tertiary institutions.¹⁰ Given the Rwandan government's emphasis on building a knowledge-based and technological society, the development of a mass of skilled personnel, both female and male, in institutions of higher learning is essential for national development.¹¹

On reflecting upon the fact that some female students have gained entrance to university to study science courses, the notion of agency comes to the fore. In this regard, Erikson's (1968) work on identity takes account of agency, structural influences, and the different levels and

⁷ For a more detailed discussion, see Chapter 6.

⁸ See also Chapters 2 and 3 of this thesis.

⁹ The subsequent elections in Rwanda have resulted in an increase of women's representation at different levels of administration. To provide an example, the parliamentary elections of 2013 saw women take 64% of the seats in the lower house of parliament and about 58% of all the members of both houses of parliament: the Chamber of Deputies (the lower house of parliament) and the Senate. In addition to representation at parliament, a third of cabinet ministers and 37% of permanent secretaries in Rwanda are women (see Abbott et al., 2015).

¹⁰ According to the Ministry of Education Statistical Year Book 2016, women studying courses in science at degree level at the University of Rwanda accounted for only 33.7%.

¹¹ See Ministry of Education [MINEDUC], 2003, 2010; Ministry of Public Service and Labour [MIFOTRA], 2013).

contexts in which power operates, (see Chapter 7). I was also particularly attracted to Goffman's (2012) views on the presentation of the self in everyday life, which relates to concepts of participation in and commitment to particular roles, the viewpoints I also discuss in Chapter 7 of this thesis. Although Erikson and Goffman's work provides significant theoretical insights into gender issues, my own personal interest in these issues - a product of lessons learned during my work with the DelPHE project and the experiences garnered as I undertook the MRes programme - motivated me to embark on this doctorate. I wanted to understand young women's lives and their persistence through the educational system, from primary through secondary school to studying at university with a particular specialisation in subjects related to science. In this sense, the present study seeks to explore the lived experiences of young women in their pursuit of science careers and other aspects of their selves, including womanhood.

1.2 Statement of Issues

As discussed earlier in this chapter, young women confront both 'out-of-school' and 'in-school' factors as they strive to acquire education in Rwanda. From being denied the opportunity to continue schooling when parents face financial hardships (Masanja, 2010) and being married off in order to provide funds for the family home (Chege and Sifuna, 2006) to being construed by male counterparts and teachers as being intellectually weaker (Brush, 1991; Warrington and Younger, 2000), young women continuously negotiate their way through all levels of education to study science subjects at university. Science subjects are seen as disciplines that are most likely to be studied by men, while the arts are viewed as being more suitable for women (Acker and Oatley, 1993; Mama, 2003; Mumporeze and Prieler, 2017), a tendency that leads to the gendering of subjects at all levels of education.

Despite studies being conducted on the underrepresentation of women in science, there is little research about the factors influencing young women to choose careers in science at university. Scholars such as Huggins and Randell (2007), Uworwabayeho et al. (2007), and Masanja (2010) discuss the role of colonisation in reinforcing gender inequalities in education. Another issue discussed by the scholars is the role of cultural stereotypes, which enable societies to define women and their place in the home. In addition, when facing particular financial hardships, there is also a tendency for parents to prioritise enrolling their male children in school at the expense of their female children (Chege and Sifuna, 2006).

The above scholarly work notwithstanding, few studies have examined the factors influencing young women's choices to study science courses at university. Moreover, an understanding of such factors would enhance awareness of how these young women negotiate the gendered constructions of science subjects in the Rwandan society. Undertaking such a study is therefore significant not only to fill important research gaps in relation to women in higher education and science-related disciplines, but also to inform education policy in Rwanda. For these reasons, I embarked on this study in order to interact with a number of young women and examine their experiences in studying science subjects, with a view to understanding how they negotiate the gendered constructions of these subjects in a bid to achieve their dreams in life.

1.3 Objectives of the Study

1.3.1 Main Objective

To enhance an understanding of the gendered construction of science and how young women challenge this construction by negotiating their way to study science subjects at university in Rwanda.

1.3.2 Specific Objectives

1. To trace the background on gender and education in Rwanda since the pre-colonial period.
2. To explore the factors influencing young women's decisions to study science subjects at university in Rwanda.
3. To explore how some young women have challenged gendered constructions to study science subjects at university in Rwanda.

1.4 Research Question

1.4.1 Main Research Question

What are the gendered constructions of science held by different stakeholders and how have some young women challenged these constructions to study science subjects at university in Rwanda?

1.4.2 Specific Research Questions

1. How has the government of Rwanda dealt with issues of gender and education since the pre-colonial period?
2. What are the factors influencing young women to study science courses at university in Rwanda?
3. How have some young women challenged gendered constructions of science at university in Rwanda?

1.5 Thesis Structure

This thesis is organised into eight main chapters. Chapter 1 provides a general background to the study, beginning with my source of motivation and an outline of the problem statement. After this, the chapter delineates the main and specific objectives of the study as well as the research questions.

Chapter 2 provides a review of the related literature, drawing on scholars' work on women and the study of science courses at university. I employ cases from Rwanda to illustrate how different scholars have approached the question of gender in science education. The chapter also explores existing literature on gender issues in science in Africa in general. In this regard, by engaging with studies carried out in other parts of Africa and the world, my intention is to highlight the trend of scholarship in relation to gender issues in science as a means of understanding the context elsewhere. Finally, with a view to informing the present study, the chapter reviews the literature on how young women have negotiated gender constructions in science subjects. As established from the literature reviewed, few studies have been carried out in the area of women in science, especially at university level. Instead, most studies have analysed the nature of colonial education and the socio-cultural, economic, and political factors that have affected women in their pursuit of a career in science. These studies, as Chapter Two argues, reveal large gaps in the research that need to be filled by a study such as the one presented in this thesis.

Chapter 3 sets the stage for a discussion of Rwanda, where this study was conducted. In this regard, the chapter outlines the socio-cultural and economic contexts of Rwanda and Rwandan society, in order to enable readers to understand how women have been constructed in society. The chapter also discusses the pre-colonial, colonial, post-colonial (the period after independence) and post-genocide eras as a means of establishing how the education of

women has been approached, so as to arrive at a point of departure for the discussions in this study. The chapter also outlines the different stages of education in Rwanda in order to illustrate how these stages have influenced young women at university in studying science subjects. Finally, the chapter briefly examines education policies in order to explore how, since the aftermath of the 1994 genocide, the Rwandan government has handled the issue of providing opportunities for female children from primary school through to secondary and to university.

Chapter 4 provides an overview of the methodology used to conduct this study, in addition to discussing the link between the methodological approaches adopted and the theoretical paradigm that informed the study. Given that the research deals with the experiences of young women who study sciences at university, it is appropriate to engage with theoretical ideas of feminism. At the core of feminist research, there is a need to advocate for equal rights for women by ensuring they have a voice to present their opinions. In this chapter, I also discuss the approaches to gathering data and, in particular, how I shared my own experiences with my participants in order to encourage them to share their own experiences of studying sciences at university. In addition, this chapter includes a discussion of population samples, the research methods used to gather data, ethical issues, negotiation of different identities, other challenges faced during the fieldwork, and the steps taken to analyse the research data presented in this thesis.

Chapter 5 provides a description of young women's experiences of studying science at university. In addition to the voices of these young women, the chapter also presents the narratives of male students, lecturers, and parents regarding young women pursuing careers in sciences at university. The young female students were pursuing science degree courses in biology, environment and water engineering, estate management and evaluation, and construction management. The male students selected for this study were those studying mathematics and construction management while lecturers were teaching courses in engineering and mathematics. In addition, the voices of two parents are summarised in this chapter, one of whom is a lecturer at the university while the other works as a farmer. As part of their narrations, I have captured information on family backgrounds and educational journeys in order to understand how the young women have persisted, despite numerous challenges, in studying sciences at the university.

In Chapter 6, I also present the research data. In doing so, the chapter discusses the social and economic factors responsible for influencing the gendering of science at university. The chapter brings to the fore how parents' education and income, family structure, community expectations, and domestic responsibilities influence young women in studying science courses at university. Other factors discussed include the complex relationship between marriage on the one hand, and schooling and career development on the other, and its influence on young women's pursuit of science courses at university. In addition, this chapter also explores how the school has become an institution wherein gender stereotypes can either be reinforced or resisted. What cuts across this chapter is the idea that Rwandan society has, over the years, construed women as emotional as well as physically and intellectually weak. In addition, women are still being regarded in very conservative terms with expectations generally being that they will get married and take care of their families as soon as or shortly after they become of age. On the other hand, men are regarded as assertive, rational, and physically strong. Significantly, in terms of intellectual capacities, men are regarded as being more intelligent than women. As such, society expects young men and women to study subjects that will concretise such stereotypes. As discussed in this chapter, socio-cultural, economic, and political factors are at the centre of gendering the various subjects that both young men and women study at all levels of education.

Chapter 7 provides a discussion of how young women have challenged gendered constructions of science subjects at university in Rwanda. Among the issues that stand out in this chapter are i) science as a subversion of femininity; ii) women using science courses as a platform to build careers as opposed to the creation of families and homes; and iii) the role of the government in ensuring that young women also study science courses at university. In addition to these young women going against the 'feminine ideals' of their society to study subjects that have traditionally stood as 'spaces' for men, this chapter presents science subjects as a platform for young women to build careers in areas of 'their' own choice. Furthermore, it demonstrates how the pursuance of careers in these areas becomes a means for young women to put marriage on hold, since they are at university for longer periods of time when compared to their counterparts who study arts and humanities courses.

Chapter 8 presents a summary of the findings and conclusions and identifies areas for future research.

Chapter Two

Literature Review

2.1 Introduction

This chapter is a review of existing literature on gender and women in science related careers. As a means of creating a point of departure for the present study, this chapter discusses relevant literature on women in science with reference to Rwanda, Africa and the world at large. Although the intention to engage in a literature review was informed by the need to identify gaps in existing scholarly works, another motivation for reviewing the works of other scholars was to understand existing trends within gender studies as well as studies relating to women in science at university.

To create a logical flow for the discussions herein, I have organised this chapter according to three main sections. The first section reviews the literature on women in science with specific reference to Rwanda while the second section is comprised of a review of the literature on a similar theme but with emphasis on Africa more broadly. The third section, discusses gendered constructions of science and demonstrates how young women have negotiated these constructions in a bid to become scientists within their respective communities. These discussions on how young women negotiate gendered constructions are also intended to enhance my own understanding of the socio-economic factors that have traditionally defined women in Rwanda. This section, also discusses how women who challenge the status quo are defined by the wider community and the kinds of identity they acquire, before making conclusive remarks. The section that follows is a review of studies on women in science in Rwanda.

2.2 Studies on Women in Science: The Rwandan Context

Generally, there is limited scholarship on women who study science at university in Rwanda. Most of the existing studies are comprised of government documents and working papers particularly developed for the Ministry of Education, Ministry of Gender and Family Promotion, and other departments. To identify research gaps for this study, I reviewed some scholarly work relating to women in science in Rwanda. Below are some of the themes identified as well as the gaps that this study has sought to fill.

One of the major themes that has preoccupied scholars who have studied women in science is the background of education in Rwanda. Among other issues, scholars have written about, i) the arrival of missionaries to Rwanda; ii) the role of these missionaries towards the establishment of formal education; iii) the nature of education that was provided to boys and girls during the colonial period in Rwanda; and finally the analysis of the education curriculum to demonstrate how education was offered to different categories of people in Rwanda. In their reviews of science and mathematics education in Rwanda, Uworwabayeho, Rubagiza and Iyamuremye (2007) present a brief background to education in Rwanda, noting the role that missionaries played in introducing formal education, as well as the nature of education offered to boys compared to girls. One of the issues that explicitly comes up in their discussions relates to how missionaries constructed the first schools in the country. By discussing how missionaries established the first boys' and girls' schools in Rwanda, Uworwabayeho, Rubagiza and Iyamuremye point to the fact that these missionaries participated in concretising the differences between men and women in society. As these scholars note, the first school for boys in Rwanda was established in 1900 while the first school for girls was put in place in 1937, almost four decades later.

Related to the issue of how missionaries participated in establishing schools in Rwanda, is the nature of the education that the colonial government provided to both young men and women. Scholars, including Huggins and Randell (2007) and Masanja (2010), have argued that the education that the colonial government provided to girls was intended to reinforce the socialised roles of women. Among these roles were secretarial skills, home economics and general hygiene. In other words, the abovementioned scholars point to the socially constructed roles of women in society to suggest that the type of education provided to them was meant to reinforce such roles. On the other hand, Huggins and Randell (2007) demonstrate how the education for boys concentrated on the three Rs, which included reading, writing and arithmetic through which they were prepared for administrative activities, enabling them to work in the public sphere as managers.

The analyses provided by Huggins and Randell (2007) and Masanja (2010) inform this study in several ways. First, they enhance the discussions on the background of education in Rwanda, as provided in Chapter Three. This is so because this study also traces the background to education in Rwanda, articulating the main stakeholders in the establishment of education. Furthermore, as this study deals with women interested in developing careers in

science, the above works are significant in discussions on the gendered constructions of science at university, as presented in Chapter Six. As noted by Huggins and Randell (2007), colonial and missionary education created curricular imbalances in that they emphasised the arts and social sciences for girls, whilst emphasising natural science and managerial subjects for boys. These are some of the factors presented in this thesis as challenges that young women strive to overcome when studying science subjects at university level.

This study has revealed that there is limited research in Rwanda on the hindrances that young women face in a bid to access education in science. However, there has been some related work. For example, Uworwabayeho, Rubagiza and Iyamuremye (2007) have written about what has traditionally made girls lag behind in science and mathematics. As Uworwabayeho, Rubagiza and Iyamuremye note,

“formal education for girls in Rwanda started much later than that of boys, almost 40 years after the first boys had been to school [... thus] the gender disparities evident in the Rwandan education system today could be a result of [... women beginning school as] ‘late starters’ [... a factor that reinforces their low achievement scores in education]” (2007, p. 98).

As can be inferred from the above statement, Uworwabayeho, Rubagiza and Iyamuremye (2007) point out that the first school for boys was established in Rwanda in 1900, while the first school for girls was established in 1937. The authors reinforce a point made in this thesis, that despite establishing a school for girls in Rwanda, the main aim of the colonial government was to train “home managers” (Ibid, p. 98), women who would merely carry out the social roles expected of them as mothers and caretakers of homes. To enhance such roles, colonial education emphasised the teaching of home economics, among other subjects, to females. To the contrary, young men were expected to study subjects such as accounting and technical drawing, in order to become engineers, accountants, and other public figures who would then be at the forefront of managing society (including women).

Although Uworwabayeho, Rubagiza, and Iyamuremye (2007) highlighted the challenges women face in studying science subjects, the focus of their work concerns the teaching and learning of mathematics and science in both primary and secondary schools. Moreover, despite their work informing the present study, they did not discuss several issues that cut across this present study, including how women have been seen to have encroached upon men’s space through pursuing careers in science. They also neglect an important aspect that of agency, and an exploration of how young women have persisted despite numerous

difficulties and challenges, to study sciences at university. These ideas come to the fore throughout my research and serve to fill in gaps that were not addressed through the work of Uworwabayeho, Rubagiza and Iyamuremye (2007).

A more recent study by Mumporeze and Prieler (2017) deals with factors responsible for women's unequal access to information and communication technologies (ICT) in Rwanda. As Mumporeze and Prieler point out, ICT has been traditionally dominated by men, and the reinforcement of women's traditional roles including child care and housekeeping have served to concretise this situation. These scholars also enlist self-worth and computer anxiety as some of the factors that account for the underrepresentation of women in ICT. According to Mumporeze and Prieler, it is important for women to participate in the use of ICT since it increases their ability to gain control over decisions that inform their lives. The ideas of these scholars relate with the current study in two ways. Firstly, they inform the present study in understanding the factors responsible for the underrepresentation of young women in science subjects at university in Rwanda. As discussed in Chapter Six, my study has established that domestic responsibilities as expected of women are among the factors that influence young women's choices to study science subjects at university. To add to Mumporeze and Prieler's (2017) work, this study has made reference to physics, chemistry, mathematics and biology as the science subjects that the young women negotiate to study at university.

Scholarly work relating to Rwanda has also focused on women in leadership and governance. Burnet (2008), in her journal article, on women's participation in the governance of post-genocide Rwanda, highlights the impact of women's political participation on gender equality in the country. In particular, Burnet discusses women's representation in parliament and other levels of government and shows how this has transformed the gendered socio-cultural roles that had relegated women and their daughters to secondary positions. Burnet discusses the fact that, as a result of the 1994 genocide that led to the killing of mostly men, masculine roles were assumed by women. In other words, traditionally constructed roles such as administration, the construction of roads and houses as well as the milking of cows became the role of some women. For Burnet, involving women in politics and other issues of governance significantly impacted perceptions about women in society – instead of being

viewed by men as subjects who could not do what the former were able to do, women stood up as role models, as people who could motivate others to also aim higher in life.¹²

In a related development, Hunt and Heaton (2014) discuss the role of Rwandan women in government, highlighting the issue of legislation. In particular, these scholars note how women parliamentarians have pushed for legislation to address gender-based violence by establishing centres where women can share stories about their situation in society. The ideas raised by Hunt and Heaton (2014) relate with the present study in terms of how women are given the platform to present their lived experiences in society. While Hunt and Heaton have discussed how legislation becomes a stage through which women are given a voice, this study also acts as a site where young women studying sciences narrate their experiences about the social-cultural and economic factors that they negotiate to study science at university.

Another recurring theme that emerges when studying women in science in Rwanda is the question of government policies on education. Scholars, including Wallace et al. (2008), write about the Rwandan government's commitment to the provision of education for both boys and girls. Their analysis is based on the educational policies and the Education Sector Strategic Plan (ESSP), the latter being the plan to execute what the educational policy intends to achieve. In addition to the argument that the GoR has committed to gender equity in education, Wallace et al. also show how other policies, including the Higher Educational Policy (2008) are committed to promote women in science and technology. The work of Wallace et al. (2008) informs this study by contributing to an understanding that the government has developed numerous policies to ensure that women study science and technology at all levels of education. Despite this, Wallace et al. leave a gap in their analysis of young women who study sciences at university, a gap, which this study seeks to fill. As will be discussed in Chapter Seven, it becomes evident that, through the enactment of numerous policies, the Rwandan government has occupied a significant space through which it facilitates the education of women, especially those interested in pursuing careers in science. This study reveals that government has been motivated to ensure that young women acquire education in science in order to fill a skills gap and to have more girls (especially

¹² It is important to note that Burnet also argues that despite women occupying higher positions in governance in Rwanda, there are still many women lagging behind. These are women still burdened with childcare, poverty and domestic work. See also Wallace, Haerpfer and Abbott (2008) on the same issue. See Debusscher and Ansoms (2013) paper on gender equality policies in Rwanda.

those from lower socioeconomic demographics) attend school. In the next section, I will review the scholarship on women in science in other African countries.

2.3 Studies on Women in Science: The African Context

In order to enhance the discussions in this thesis, I found it pertinent to engage with scholarly works on women in science from the African continent. Besides boosting the content of the discussions presented herein, engaging with scholarly works from the African continent provides an understanding of the context of studies done elsewhere, to inform the present study.

Among the themes that predominate scholarly work on women in education from the African continent relates to women's representation in science disciplines at higher levels of education. In her journal article on gender politics in higher education in Africa, Mama (2003), one of the key feminist African scholars writes about the plight of women in education as a whole and science and technology in particular. With reference to Nigeria and Ghana, Mama discusses how governments in Africa have begun to look at science and technology as fields that can give their nations a foundation to transform into modern states. She demonstrates how the governments of the above nations have appropriated slots at university to both male and female students, with the ratio of the former to the latter standing as 60:40. Despite these appropriations, Mama notes that women have lagged behind men in relation to education. Not only are some women relegated to 'low status' programmes at university – including humanities and social sciences – these women are still underrepresented. As Mama notes, in cases where women venture into science courses, they tend to study nursing, which is among the courses that relate to the traditional roles constructed for women in society.

Another scholar discussing the question of underrepresentation of women in education, especially in science, is Masanja (2010). Masanja's work is about gender from the African perspective but draws on examples from Rwanda and Tanzania. In relation to her case on the University of Dar es Salaam (Tanzania), she re-echoes Mama's ideas on the underrepresentation of women in higher education specifically in science, mathematics and technology. Masanja argues that although there have been policy attempts to bridge the gap in science and technology studies through strategies like affirmative action, there is a disparity in enrolment for boys and girls in such areas.

To justify the inequalities between females and males in science courses at university, Masanja enumerates a number of factors, namely: i) the practice of stereotyping knowledge and skills given to girls and boys at the beginning of formal education, which influences the gendered nature of education; ii) the unequal care given to girl children as compared to boys as well as the responsibilities expected of girls in a home; and iii) girls attending school much later due to the fact that girls' schools were introduced almost 40 years after boys' schools were established in Rwanda (Masanja, 2007).

The works of Mama and Masanja relate with the current study in terms of the place of women studying science subjects in Rwanda. As this study shows, women grapple with the socio-cultural constructions that put them in positions where society expects them to help with domestic chores. This is exacerbated by the cultural tendency that leads some parents, who do not have the financial resources to educate all of their children, to choose to educate boys in cases where the latter are faced with the dilemma of making the decision of choosing between the boy and the girl to be taken to school. In addition, when Masanja talks about the government coming up with policies to ensure that women also study science subjects at university, she re-echoes the idea presented in this study that through numerous policies, the GoR has encouraged young women to embark on careers in science at different levels of education including at the university.

Besides the question of underrepresentation of women in sciences at university, another theme that emerges is Tamale's (2004) idea of access and control of resources. According to Tamale, society is divided into two spaces: domestic and public arena. The public arena is usually dominated and controlled by men and it is the space that is associated with activities like politics and business. It has power, wealth, privileges and opportunities. By men not allowing women to access this space, they want them relegated to the home to be in-charge of children and other domestic activities. Such activities include farming, producing and rearing children, caring for the sick and elderly, just to mention a few of these activities. What permeates Tamale's work is the view that children, especially girls, grow up while knowing that the domestic space is for women while the public one is for men. Furthermore, these girls know that they have to grow up, marry, bear children and be reliant on their husbands for their survival.

As Tamale puts it, those who cannot marry and bear children carry a “permanent stigma” since they can be looked upon as failures in terms of what society constructs them to be. She also notes, that “any woman who wishes to make this transition to the [public sphere] is forced to meet the male/masculine standards required in the public world” (2004, p. 53). The ideas of Tamale as discussed above relate to the present study in several ways, including the view about young women scientists as people who have encroached on men’s space thus subverting the socio-cultural norms of society. By discussing how young women scientists struggle to study sciences – subjects, which have traditionally been associated with men – I demonstrate how they have encroached upon men’s space. I show how instead of getting married, producing and nurturing children, these young women particularly after reaching adolescence, are expected to get married. However, due to the fact that they have to spend a lot of time at university in order to pursue their careers in science, and in so doing, go against societal expectations to get married, produce and nurture children. Consequently, I draw on Tamale’s ideas to discuss how young women have rejected the gender categorisations of society to study courses in science at university.

Scholarly work on women in science in Africa also discusses the relationship between family background and the children’s choices of subjects to study at school and later at university. In other words, how educated is the father, mother and other siblings in the family? What jobs do they do? How wealthy is the family? In her study on family structure and parental perceptions on children’s schooling in Kenya, Buchmann (2000) reflects on the above questions. She specifically talks about how the resource constraints of a family determine the decisions of that family on the education of their children. As she notes, poor families find it difficult to fund the education of their children since this is looked at as jeopardising the family income, unlike the rich ones who may have surplus financial resources, thus giving them an opportunity to pay for the different requirements of their children at school. For the poor parents, Buchmann (2000) notes that they usually send their children to work as a way of making them contribute to family welfare. She brings in the issue of polygamous and monogamous families and shows how they influence the education of children in a home. According to Buchmann, polygamous families have greater needs, which demand more resources as compared to monogamous households. This is a factor, which also impacts on the education of the children in a home. As noted in this study, it becomes pertinent that family background affects the education of children. More so, it influences individuals’

choice of subjects to study at school and at university. It also shows how the nature of family in terms of how many wives the father has impacts on the income level of the family and even the education of the children. In this latter case, the study shows how some of the participants are influenced by such backgrounds to study hard to change the lifestyle of their families.

Relatedly, writing about the perception of the value of daughters and girls' education among the Isoko (Nigeria), Edewor (2006) re-echoes the above ideas as presented by Buchmann. Although Edewor does not deal with the issue of family background in terms of economic status, level of education of the parents as well as polygamy and monogamy, he evokes insights about the value of different sexes of children by the Isoko people. He explains how boys were looked at as well as their value in society vis-à-vis that of girls. As Edewor points, the value attached to boys among the Isoko resonated with the value society attached to their education. Boys were seen as people who would perpetuate the family name, support parents in old age and inherit family property. On the other hand, girls are considered as people who would grow up and get married to people far away from home. As such, these constructions informed the decisions parents and other community members made in relation to the education of girls and boys. Edewor points out that among the Isoko, parents promoted the education of boys since they were more valued than girls – girls were seen as people who would take the benefits of their education to their husbands. These insights by Edewor inform my discussions in Chapter Six. By discussing the socio-cultural context of Rwanda, Chapter Six brings to the fore the factors that influence women's choices to study science at the university. In the next section, I engage with literature related to negotiating gendered constructions of science in order to pursue careers in these areas by young women.

2.4 Negotiating Gendered Constructions of Science: A Global Perspective

As this study is geared towards an understanding of how young women have negotiated gendered constructions of science to pursue careers in this field at university, it became imperative to engage other scholars' works on how students have negotiated gendered constructions of science as they pursue their careers. Among the salient questions that informed my engagements with scholars' works were: What motivates young people, especially women to study science courses at university? How do young women negotiate the gendered constructions of science to study these subjects at university? In this section, I

discuss the factors scholars have presented as responsible for motivating young women to negotiate gendered constructions of science at university to pursue careers in these subjects.

The idea that some people can become role models thereby playing a significant role in influencing others to study certain careers in life permeates scholarly works on gender studies. Among other things, in her book on feminism, Walters (2005) writes about the nineteenth century English women such as Elizabeth Garrett Anderson and how they faced opposition in pursuing careers in science. According to Walters, as Garrett was pursuing her ambition of becoming a medical doctor, her peers, particularly male students, could discourage her, sometimes avoiding to interact with her during class time. Medicine was looked at as a male domain and any woman could be seen as encroaching on men's space. As Walters writes, "some male students announced their disapproval of impropriety of males and females mingling while studying subjects which hitherto have been considered of a delicate nature" (2005, p. 63). Despite this attitude, Walters writes that Garrett was motivated by another female, Elizabeth Blackwell, who had graduated in medicine from New York.

Similarly, in her study in the United States, Baker and Leary (1995) discuss factors influencing girls between grades 2, 5, 8 and 11 to study science subjects. Unlike Walters who shows how the young women studying sciences can look to fellow women elsewhere as role models, Baker and Leary demonstrate how schools can bring forward role models to highlight the contribution of women to science. In addition, Baker and Leary show how schools can engage in activities geared to highlighting what other women have done in the area of science as a means of motivating others.

In relation to Walters (2005), science courses in Rwanda, like in other African contexts, are considered masculine. By drawing on this specific viewpoint, my study answers several questions in relation to the construction of different subjects as feminine and masculine and how males and females are socialised to fit in these dichotomies. In relation to Baker's and Leary's insights, they inform my analysis of how some of the participants were socialised at school through different role models and mentors to pursue careers in science. More so, Baker's and Leary's ideas help in the understanding of the school as a site for either encouraging or discouraging different genders to study the various subjects as demonstrated in Chapter Six.

In addition to the idea of role models, being at the centre of scholarly discussions on women in education is the question of a change of attitude by parents towards the education of the girl-child. Among other issues, ideas that come up in these discussions include: i) changing perceptions by parents on the value of education for their daughters; ii) how education fosters social mobility; and iii) ways through which parents deal with their pregnant daughters so as to prolong their stay at school. In relation to the Isoko of Nigeria as has already been discussed, Edewor discusses how parents have changed attitude about their daughters. He discusses how not only have women ceased to be looked on as people who should bring to the family bride price, but society has also realised how the education of young women can lead to their social mobility. Social mobility, as discussed in Chapter Seven, relates to the movement from a lower social status to a higher one including being a medical doctor, physician and surgeon. Edewor shows how parents treat pregnant daughters especially through allowing them to give birth and take them back to school afterwards or even encouraging them to terminate their pregnancies so that they remain at school.

Another issue that preoccupies scholars on women in education relates to equity. Baker and Leary refer to equity as ‘... notions of fairness with the cultural images of femininity and masculinity’ (1995, p. 20). It brings in the notion of ability; to show that men and women are equal and can perform the same role. What is in play is an individual’s ability to perform a certain task. In their study on girls studying science in grades 2, 5, 8 and 11 in the United States of America, Baker and Leary point out to equity as one of the motivations for young women to strive to study science subjects at school. Through their findings, they explain the fact that young women disagree with the view that ‘girls cannot do science or they cannot become scientists’ (p.20). This is due to the awareness of the cultural constructions about women studying science or becoming scientists. That these girls felt that they are people and are equal with boys and therefore can also study sciences and become scientists is what Baker and Leary emphasise in their work.

Similarly, in her study on gendered subjects and student ability among secondary school students aged between 14 and 16 in Britain, Francis (2000) evokes the notion of ability. This is meant to highlight ways through which girls negotiate their way to study sciences at school despite the socio-cultural constructions. She argues that traditionally, subjects including mathematics, physics and chemistry were considered more difficult than English and history. According to Francis, girls avoided the former and concentrated on the latter subjects since

they were considered as feminine (with sciences considered masculine). Due to changes in government policy (especially ensuring that both boys and girls study all the subjects), Francis asserts that girls began outcompeting boys in the traditionally masculine subjects. As she put it, this scenario where boys and girls were expected to study the same subjects has brought to the fore the question of ability. This implies that one's performance at school is dependent on an individual but not his/her gender (Francis, 2000).

The above ideas inform the present study. They are significant in supplementing the discussions of some of my participants especially in relation to why they chose to study science courses at university even when the Rwandan society constructs such subjects as masculine. Although I also draw on how young women have persisted through the different educational levels to study science courses at university, the main aim of this study is to deal with the university context, which is not the case with Baker and Leary (1995), and Francis (2000). These scholars deal with students in high school as well as primary schools and their motivation to study science subjects. To this end, my study brings to the fore a different context in the study of gender and science education at university.

The view that some girls are able to study science subjects even after high school has been an issue of investigation in scholarly circles. In their study of seven girls aged between 10 and 16 years, Archer et al. (2017) discuss gendered patterns of girls' participation in physics in Britain. These scholars point to high attainment and high academic abilities as some of the factors enabling these young women to study physics after high school. Besides, they assert that the high family science capital is among the factors that motivate young women to study science subjects during their post 16 studies. By the notion of high family science capital, Archer et al. (2017) refer to the strong stance by parents to value science subjects. These parents are presented as people who are scientists and can encourage their children to follow suit.

Similarly, Acker and Oatley (1993) discuss the participation of women in science at high school and university. Making reference to Canada and the USA, these scholars address the barriers and innovations for young women aspiring to study science in schools and later at university. Among the barriers that Acker and Oatley enumerate include fewer opportunities for funding, discomfort of being a minority group among the boys who have been traditionally privileged to study science subjects and the scarcity of female role models and

mentors at university. Acker and Oatley also note that despite the barriers that prevent girls from studying science, these girls have begun to study science subjects because of the measures put in place by the Canadian government, measures including creation of policies that eliminate sex stereotyping in text books and curriculum guidelines, the latter intended to broaden career goals of young women in science.

The views raised by both Archer et al. (2017) as well as Acker and Oatley (1993) relate to the current study in several ways. Firstly, while investigating factors that influence young women to study science subjects at university, the question of family background has come to the fore as the case of Archer et al. (2017) has demonstrated. Questions like what is the background and career of parents were significant in understanding how the former influence the latter in choosing science subjects at the university. To add to Archer et al. (2017), Acker and Oatley (1993) discuss the ways through which the Canadian government has adopted a number of policies to mitigate gender disparities in science at high school and university. These viewpoints are significant in understanding the situation of gender representation in science at university in Rwanda.

Finally, the nature of curriculum and how it affects the education of boys and girls forms a critical theme of discussion on women in education. In their article on gender equality through curriculum and pedagogy change, Aikman, Unterhalter and Challender (2005) examine the practices of curriculum and pedagogy, which promote quality education for both boys and girls. By picking on a particular school in northern Mozambique, these scholars reveal that male teachers harass female students and this is a major influence on girls to drop out of school. Among the suggestions to ensure equitable education for both girls and boys, Aikman, Unterhalter and Challender recommend the putting in place of a curriculum that promotes gender equality and gender-equitable pedagogical practices. In relation to pedagogy, these scholars note the role of teachers in delivering the curriculum.

As pointed out in Chapter Six, schools are spaces for encouraging and discouraging the study of subjects by the stereotypes that teachers construct around both female and male students. By drawing on studies such as what Aikman, Unterhalter and Challender have conducted in Mozambique, the present study analyses the influence of schools as one of the factors that discourages young women to study science subjects at university. Moreover, by narrowing down on the topic of sciences, my study fills the gap left by these scholars as they talk about

education in general terms, without dwelling on the issue of sciences and how young women strive to study these subjects at university.

2.5 Conclusion

In this Chapter, I have reviewed literature of scholars who have written about women in science. I have engaged with scholarly works on Rwanda, the African continent and other parts of the world including Britain, Canada and the United States of America. The inclusion of scholarly works outside Rwanda has played a significant role in positioning this study at the international scene. In this regard, it becomes plausible that institutionalised barriers to female engagement with science are not merely a local or national issue, but something that is experienced elsewhere. Although my study does not deal with education in general terms, I have included literature in this area as a way of situating my arguments on women and their struggle to study science courses at university. I have also included studies on primary and secondary schools, for the same purpose.

The literature reviewed in this chapter has demonstrated that although scholars have written about women and education, most studies point to underrepresentation of women in science subjects at university. They demonstrate how this underrepresentation goes back to colonial times; the period formal education was introduced in Rwanda. Furthermore, the nature of the curriculum during this time was geared towards providing different forms of education to boys and girls thus creating gender disparities that are evident in the Rwandan education system.

These issues are significant to the current study in terms of providing information that is crucial to an understanding of the background to education in Rwanda as well as trends in scholarship on women into science in higher education in Rwanda. Although I have reviewed other scholars' works as this chapter has demonstrated, this chapter represents only an overview of these works. I will incorporate other sources as the thesis unfolds.

In the next chapter, I discuss the background to gender and education in Rwanda.

Chapter Three

Background to Gender and Education in Rwanda

3.1 Introduction

In their study on gender equality in Rwanda, Abbott and Rucogoza (2011) point out that by 2008, Rwanda had made significant strides in achieving gender equality and empowerment of women.¹³ Besides attaining more than 50% of decision-making positions and working towards reducing gender-based violence, Rwanda has put in place “education for all” programmes in both primary and secondary schools as part of the concerted national efforts towards the attainment of gender equity in education.

In a bid to understand how young women negotiate gendered constructions of sciences at university, there is a need to provide a contextual background to gender and education in Rwanda. As such, this chapter traces the nature of education the GoR provided to both boys and girls during the pre-colonial, colonial, independence and post-genocide periods. It examines the different policies that are related to education to establish how the government has handled the question of providing education to young men and women in colleges and universities. The chapter also discusses how the GoR has handled the issue of both girls and boys education right from primary through to secondary schools. Like other African societies, Rwanda is a largely patriarchal society in that men tend to override women in decision-making in homes and accessibility to resources, especially land. As such, this chapter also provides a brief historical and socio-cultural background to Rwanda.

To achieve a logical flow in discussing these issues, the chapter is organised into three main sections. The first section is not only a glimpse of the geographical location of Rwanda in relation to its neighbours, but also a discussion on the economic context of Rwanda. By discussing the economic background of Rwanda, I provide information on the nature of economic activities different people engage in. This is intended to show how the economic status of families has influenced the education of the girl-child, especially the quest to pursue careers in science. The second section is a discussion of how education in relation to gender

¹³ It is generally believed that the political will of the Rwandan President Paul Kagame when he took over power after 1994 and the adoption of the recommendations from the 4th world conference on women held in Beijing (China) in 1995, that are the key factors underpinning important changes in the Rwandan society (see GoR, 2010).

was conducted during the pre-colonial and colonial periods. This information is significant as it highlights the issues that informed the nature of education provided during these periods in order to create a point of departure for my discussions in Chapter Six.

It is important to note that studies about Rwanda in the last two decades have tended to underscore the impact of the genocide that took place in 1994. Because of this ethnic cleansing, all the socio-economic, political and educational aspects of the Rwandan state were destroyed. To begin the enormous task of national reconstruction, the post-genocide government has developed policies to cater for all the above sectors in society. As such, I have found it pertinent to add my voice to these discussions by examining how post-genocide Rwanda has handled the gender question in education from primary and secondary school level to tertiary education. These issues are presented in section three of this chapter before making concluding remarks on the discussions presented in the chapter. In the next section, I present the geographical location and economic context under which Rwandans thrive in the contemporary period.

3.2 Geographical Location and Economic Context of Rwanda

3.2.1 Geographical Location

Rwanda is one of the countries located in Central Africa. It is bordered by Uganda to the north, Tanzania to the east, Democratic Republic of Congo (DRC) to the west and Burundi to the south. While Rwanda is geographically classified as belonging to the Central African region, her major political and economic activities are shaped and influenced by the Eastern African bloc and the Great Lakes Region (GLR) of Africa. Indeed, Rwanda is among the East African Community (EAC) member states, having joined this coalition in 2007.¹⁴ It is a land locked country covering roughly 25,000 square kilometres of land and 1,400 square kilometres of water. As the National Institute of Statistics of Rwanda [NISR] article (2014) has pointed out, Rwanda has a population of 10.5 million people, of which 51.8% are women and 48.2% men. Considering its geographical size, Rwanda is not only one of the countries having the fastest growing populations in the GLR, but is also among the most densely populated countries in sub-Saharan Africa (Diao et al., 2010).

¹⁴ The Republic of Rwanda signed the East African Community Treaty on 18th June and became full member of the community from 1st July, 2007. Other countries within the East African bloc include Uganda, Kenya, Tanzania, South Sudan and Burundi.

3.2.2 Economic Context

Rwanda is predominantly an agricultural state. This sector provides over 80% of the Rwanda's Gross Domestic Product (GDP). As Carr and Halsey (1999) point out, Rwanda is richly endowed with a conducive climate (experiencing rainfall most of the year). Moreover, her proximity to the equator makes it possible for Rwanda to have abundant sunshine. Coupled with rich sunshine, abundant rainfall makes Rwanda one of the agricultural hubs in the GLR. In the Virunga volcanic mountains, which are among the most fertile places in Rwanda, people grow coffee, tea, bananas, maize and cassava for both domestic use and international markets. This has earned the country foreign exchange.

Whilst men participate in agricultural production, more than 60% of the work in this sector is done by women. By tilling the land, women are expected to fulfil their traditionally constructed role of being providers of food for the family. Despite this, women's efforts to provide for their families by engaging in agriculture have been hampered by the type of technology they use. Most of the tools used, especially in rural areas, are rudimentary in nature. Besides affecting the productivity of agriculture, meagre income in terms of output is one of the outcomes of this. As discussed in Chapter Six, low proceeds from agriculture have forced many parents to make a choice between sending either their male or female children to school, with males often taking precedence over females.

As I have mentioned at the beginning of this chapter, the socio-political and economic structure of Rwanda was shattered by the 1994 genocide. From the destruction of infrastructure in terms of buildings, roads, schools and hospitals to the killings that characterised this period, the country's ability to attract private and external investments was affected. Consequently, people became poor, with almost nothing to depend on. However, as noted in the Ministry of Finance and Economic Planning [MINECOFIN] report,

Rwanda managed a quick economic turnaround following the devastating conflict in 1994. It took Rwanda four years to recover in economic terms, measured in terms of the country's real Growth Domestic Product (GDP), from the genocide in Rwanda [...] This growth was driven mainly by agricultural production as well as by commercial services and manufacturing (2015, p.3).

The economic situation in Rwanda has been influential in determining whether or not certain families are able to send their children to school. More specifically, someone's economic status does not only influence whether the family can afford to cover costs for a science or an

arts and social science degree course, it also determines whether the parent can educate both sons and daughters. It is also important to note that the categorisation of people under social classes known as the *Ubudehe* system is informed by the need to identify different economic statuses of Rwandans. As also discussed in Chapter Six, the different categories of people in relation to their economic status are at the centre of determining government funding for people intending to pursue education at tertiary level. Before returning to engage in these discussions in section 3.6.3 of this chapter and Chapter Six, it is pertinent to discuss how education, especially for women, was handled during the pre-colonial times.

3.3 Education and Gender in Pre-colonial Rwanda

Ethnically, Rwanda is comprised of three groups of people namely the Hutu, Tutsi and Twa.¹⁵ Walker-Keleher (2006) in her article on the ‘relationship between conflict and education in Rwanda points out that the Hutu account for approximately 85% of the Rwandan population, the Tutsis approximately 15% and the Twa being the smallest group making up approximately 1% of the population. Before colonisation, Rwanda was a monarchy ruled by a king. This king, called *Umwami* in Kinyarwanda, was a Tutsi. As Walker-Keleher (2006) notes, the Hutu and Twa occupied subordinate roles within the monarchy. As well as being leaders, the Tutsi were also cattle keepers while the Hutu and Twa counterparts were largely farmers and hunters respectively. The socio-economic status and nature of work carried out by a particular group reflected the social stratification of the ethnic group in question. As an example, the Tutsi, being cattle keepers, were considered of higher status than the Hutus and Twa. Cattle were (and are still) a source of prestige among the Tutsi as they represented wealth.

¹⁵ Indeed, some scholars including Melvern (2000) and Prunier (1995) argue that the people Twa, Hutu and Tutsi are not tribes of Rwanda. As hypothesised by these scholars, the words Hutu and Twa meant ‘subjects’ because these people indulged in agricultural activities. The Twa lived by hunting and gathering in the forests. On the other hand, Tutsi meant ‘upper’ class because they mostly were cattle keepers, people who possessed a lot of wealth in form of cattle. It is important to note that members of Hutus and Twa could become Tutsis upon acquiring big herds of cattle. Likewise, a Tutsi who lost his cattle and became ‘poor’ could be regarded as a Hutu/Twa. Scholars such as Newbury (1998), Hintjens (1999) and Dallaire (2009) argue that these class categories were a creation of the Belgians, the latter being the colonial masters of Rwanda. In reality, before colonisation, these groups of people were not as distinct as it turned out to be during and after colonisation. The different groups of people (the Hutu, Tutsi and Twa) in Rwanda regarded themselves as neighbours. They identified each other in accordance to clan affiliations and a clientele system called *Ubuhake*. Discussions on *Ubuhake* are beyond the scope of this study.

As already pointed out, what is now known as Rwanda was administered under kingdoms, with the Tutsi kingdom being the most dominant one. These political institutions were among others, judged with the responsibility of ensuring that certain values in society were passed from one generation to another. In a document about early literacy promotion in Rwanda by Honeyman (2014), there was the *itorero*,¹⁶ which became among the institutions through which pre-colonial Rwanda carried out its education programme.¹⁷ While the *itorero* was engaged in the education of boys, Gahima (2012) notes that there was also *ibohero* - a school meant to train girls into becoming respectable mothers and wives in society. Both men and women were expected to uphold traditional values of their society. Needless to say, education during pre-colonial Rwanda was informal in nature. Parents and elders played a key role in taking responsibility for teaching young people the values of society. There were several topics upon which the teaching rotated: enforcing good manners, the making of household items such as the art of pottery, story-telling techniques and support of the community. As Uwineza and Pearson (2009) have noted, traditionally gender relations in Rwanda revolved around the division of labour rather than equality of sexes. According to these scholars, 'Rwandans considered men and women responsible for fulfilling their respective roles and obligations within the family and community' (Uwineza and Pearson, 2009, p. 8). On the one hand, women were child bearers and food producers besides generally managing the affairs of the family. On the other hand, men were responsible for building houses, collecting firewood, clearing the bush and tilling the land. This division of labour demonstrated respect and co-existence between men and women.

In spite of the complementary nature of the roles of men and women in pre-colonial Rwanda, Uwineza and Pearson (2009) also argue that some aspects of gender relations were oppressive and patriarchal in nature. This means that women were supposed to defer to men particularly when making decisions in a home besides the restrictions meted on them not to speak in public. The education that was provided during this period was geared towards the concretisation of the above roles and relations among men and women in society.

¹⁶ With reference to the history of Rwanda; *Itorero* was an educational institution and a mechanism through which society channeled various instructions relating to her cultural values. In contemporary Rwanda, *itorero* has played a crucial role in grooming national leaders. *Itorero* trainees would delve deeply in discussions relating to national programs and Rwanda's cultural values with the aim of reaching consensus on how people should behave in order to have a Rwanda with morally upright people. These are considered to be people who are humble, patient and having good conduct.

¹⁷ See also Vansina (2004).

As I have also pointed out before, men and women performed specific roles in society. From being mothers who were expected to produce, nurture children, cook and clean the house to being able to look after the husband, the education of women received was intended to support families within the private sphere (Jefremovas, 1991; Gahima, 2012). Colonisation did not only affect other aspects of social life in Rwanda, it also had an impact on the nature of education provided in the country, specifically in relation to men and women as discussed in the following subsection.

3.4 Education and Gender in Colonial Rwanda

Rwanda was first colonised by the Germans between the period 1899 and 1916. However, after World War 1, this territory was “relocated” to the Belgians. Among the significant aspects of life, that the colonial administration brought to the colonised people was the introduction of formal education.¹⁸ As opposed to informal education where instruction was largely through informal settings, formal education entailed the setting up of recognised centres where learners were gathered for instruction. According to Honeyman (2014), despite both the Protestants and Catholics arriving to do missionary work in Rwanda, the latter had a significant impact on formal education in Rwanda. Honeyman writes particularly about the contribution of the Catholic church to formal education in Rwanda as follows,

[...] formal schooling was most widely spread by the Catholic church, which introduced basic literacy and developed an instructional style based on the call-and-response learning of catechism [...] the Catholic “White Fathers” order [...] had the greatest impact on making education accessible to the masses. By 1923, the Catholic “White Fathers” mission reported 267 elementary schools, with almost 24,000 pupils—although many of these schools were in reality catechetical centres, emphasising oral call-and-response instruction and offering only very basic academic preparation (Honeyman, 2014, p.20).

Like in other colonised lands, education in Rwanda during the colonial period introduced single sex schools (for boys and girls) as part of the education system. While the colonial administration (in collaboration with missionaries) introduced schools for both boys and girls, the first boys’ school was established in 1900 and that for girls came up in 1937, almost after

¹⁸ Although the Belgians may be credited for spearheading formal education in Rwanda, their German counterparts played a role in introducing this type of education in the country. Like it was the case elsewhere where colonial rule was practiced, the purpose of formal education was to enable colonial masters train clerks and official messengers among other personnel, to foster colonial administration.

forty years (Uworwabayeho et al., 2007). The major characteristic feature of such schools was to mentor students in ways that could perpetuate gender hierarchies in society. In boys' schools, many of the subjects had a focus on manual skills including woodwork, metalwork and technical drawing. By comparison, girls' schools focused on disciplines like home economics and general hygiene (Huggins and Randell, 2007). All the subjects mentioned above were intended to produce people who would fit into the constructed roles for men and women in society.

It is important to note that although education became a means for the colonial master to reinforce gender stereotypes as noted above, it was also meant to concretise colonial administration and missionary work. Not only did colonialists train Rwandans to become clerks, office messengers, bookkeepers and secretaries, but also translators and interpreters of the bible. Uworwabayeho et al. write that colonial administrators in Rwanda paid 'lip-service' to traditional values and did not promote them through the nature of education provided at the time. Uworwabayeho et al. note that,

Schools were later set up and mainly managed by missionaries [...] with the main objective of evangelisation, and training administrators of the colonial power [...] Rwandans believe that education at that time was characterised by mistrust of traditional values, knowledge and literature and thus there was no effort to incorporate the Rwandan traditional experiences in the colonial education system (2007, p. 95).

Despite Belgian colonial masters introducing education to Rwandans during the colonial period, they did not allow them deeper access to education for fear of political uprisings in the country (Honeyman, 2014). Generally, the period between late 1950s and mid-1960s was characterised by agitation for independence by most African countries. Due to this, several uprisings were witnessed in countries like Ghana (formerly the Gold Coast) and Kenya (which had the *Mau Mau* rebellion).¹⁹ With the influence of the uprisings in other countries, the local population in Rwanda began agitating for independence. Rwanda gained full political independence in 1962. The nature of education and how the issue of gender was handled by post-colonial Rwanda is the focus of the discussions that follow in the section below.

¹⁹ See Ogot and Ochieng (1995); Enzewor (2001); Ahlman (2011) and Adeyeri, (2018).

3.5 Education and Gender in Post-Colonial Rwanda

As noted above, Rwanda got independence in 1962. Upon gaining independence, the new government brought up reforms in different sectors of the state. In the education sector, Walker-Keleher writes that at the time of independence, the “country had forty secondary schools, including six seminaries and thirty-four *ecole libres* subsidies” (2006, p.38). Important to note is that most of these schools were under the control of the Catholic church although some of them belonged to the Protestant church. As Walker-Keleher, (2006) has pointed out, the ownership of these schools was transferred to the government, which had established the Ministry of Education (Obura, 2003). This ministry later foresaw the enactment of diverse laws to promote and regulate education in the country.

With the Hutu now in full control of political power, a policy of ethnic quotas in education was introduced to ensure that more preference is given to Hutu children to attend school, with the Tutsi remaining highly marginalised.²⁰ Even with various reforms within the quota system (Obura, 2003; Walker-Keleher, 2006) and other initiatives over the years, the educational climate throughout the post-independence era continued to be characterised by inequitable access.

Although Rwanda achieved independence in 1962, tensions between the Hutus and Tutsis did not cease. Moreover, these tensions emanated from the unequal education opportunities highlighted above. As pointed out earlier, after independence, political power shifted from the Tutsi to the Hutu, culminating into majority of the former ethnic group fleeing the country and becoming refugees in Uganda, Burundi, Tanzania and Zaire (the present Democratic Republic of Congo). In fact, many of the Rwandese who fled the country as refugees were denied re-entry during the first and second Republics (1962-1994). This forced them to re-organise and come back to the country through a revolution in early 1990s.²¹ As most of the

²⁰ Obura (2003) discusses that during the colonial period, preference was first given to Tutsis in as far as accessing education in Rwanda was concerned. They were the ones taking the biggest percentage of vacancies at Astrida College, which was by then the most prestigious school in the country. During the initial stages of Rwanda’s independence (during the regime of Kayibanda – the first President of Rwanda, and that of Juvenal Habyarimana (the second President of Rwanda), ethnic and regional quotas were emphasised during the admission of students in primary and secondary schools. Ethnic admissions were based on what Cooksey regards as a “theoretical national population of 90% Hutu, 9% Tutsi and 1% Twa” (1992, p.18) as quoted in Obura, (2003).

²¹ See, for example, Prunier (1995); Desforges (1999); Melvern (2000); Waugh, (2004); Mamdani (2004) and Kimonyo (2019).

revolutionaries were Tutsi, Hutus organised the genocide in 1994 against Tutsi minorities and moderate Hutus in a desperate move to hold onto power.

Generally speaking, genocide denotes an effort to exterminate members of a particular ethnic group (Uvin, 1997; Hintjens, 1999). In the case of Rwanda, the 1994 genocide, which is also known as ‘ethnic cleansing’, was sparked off by ethnic differences between the Hutu and Tutsi. Due to the historical tensions on identity with the Tutsi occupying dominant positions while their Hutu counterparts occupying low-status positions, the latter did not want to give the former an opportunity to return and hold power again. As Hintjens (1999) has also observed, due to their historical ethnic privileges and the tendency to show their dominance, the Hutu wanted to get rid of Tutsi domination once and for all. Consequently, the social, economic and political life of Rwandans was shattered. Moreover, considering that the position of women in relation to education was at the periphery, the genocide only served to worsen this situation.²² It was therefore an enormous task for the in-coming government to restore society through a multifaceted approach. As such, when the RPF came to power in 1994, one of the tasks was to establish how to improve the education sector. From setting up new educational centres (primary and secondary schools, colleges and universities) to ensuring that both men and women go to school and at university, there were concerted efforts to make education accessible to all (Hodgins, 2006). In the next section, I discuss the government efforts towards gender equity in education since 1994, the year a new regime took over state power in Rwanda. I examine how the government has not only provided education for all in primary and secondary, but also how education was provided to Rwandans at tertiary level.

3.6 Education and Gender in Post-Genocide Rwanda: Efforts in Addressing Gender Disparities from Primary to Tertiary Levels

In the previous section, I have observed how the 1994 genocide in Rwanda shattered all sectors of the state. From the ethnic cleansing of Tutsi minorities and moderate Hutus, clampdown on political, economic and the educational sector, every aspect of society came to a standstill. As with other sectors of government, the education sector was shattered as a

²² In situations of war, women usually become the worst victims. As people who take care of children, they trek long distances to take their children to safety. Most of them end up in refugee camps as they are sometimes abandoned by their husbands. It therefore takes longer for women to reconstruct their lives in situations of conflict than men.

result of the 1994 genocide. From the killing of personnel working in the education sector (such as ministry staff, workers of the curriculum development centre, national examinations centre, just to mention a few of the different departments under the education sector), destruction of infrastructure to the loss of materials for teaching, everything was destroyed. The state in which the education sector was during the aftermath of the genocide in Rwanda is clearly captured through Obura's work as follows,

The education system survived in the heads of those practitioners who remained within the country or who swiftly returned. Very few of the teachers were left. The surviving components of the system included dispersed documentation on curriculum and syllabuses, examples of textbooks, physical shell of the ministry, some provincial and commune educational offices, and some schools. There were some ministry officials and some teachers; but no children. The schools were closed; empty and quiet after the holocaust. [There was almost no curriculum]. They [had nothing to do but] to make a fresh start. [The new government] wanted to get rid of anything in the education system, which echoed what was euphemistically called 'the errors of the past' (Obura, 2003, p.55).

This necessitated concerted efforts to rebuild society. First, the GoR, in 1998, adopted an education sector policy to bring the solution to the already shattered educational system. This educational policy formulation aimed to address the problems with educational provision, and to face the new challenges of socio – economic reforms and the increasing demands for human resource development. The new enacted policy after the genocide was guided by the principles of equity and access. In accordance with these principles, the notion of gender was partly part of the policy and agenda. One other issue that was emphasised relates to the discriminatory policies that the first and second Republics adopted in education. Firstly, access to school was based on an elaborate criteria which included the following: i) "the marks one scored; ii) continuous assessment or academic history of the child; iii) regional quotas; iv) ethnic quotas; and v) gender quotas" (Walker-Keleher, 2006, pp. 38-39). Walker-Keleher stresses that although on the surface this seemed a sufficient policy for access to education, a critical analysis of how this policy worked showed a lot of flaws. As Melvern (2000) also writes, the policy did not give the Tutsi equal access to education as was done to the Hutu. The Tutsi were only allocated 9% of the slots in schools, and universities.²³ However, when the new government came in power after the genocide, it adopted policies

²³ The Twa, who constitute only 1% of the population are not mentioned in the literature on how they participated in the activities of the State. Even up to the time I conducted this study, the Twa remain a group that is not so much talked about in Rwandan politics.

which outlawed any form of discrimination. As already mentioned above, the education policy of 1998 became a basis upon which the education sector was to be restructured. Through this programme, Rwanda worked to achieve numerous international targets in the education sector: Universal Primary Education (UPE), and Education for All (EFA) programme. As the Education Sector Policy was revised in 2003, technocrats synchronised the education system with other related programmes including Poverty Eradication Strategy (PES), Decentralisation Policy, Information and Communications Policy through a programme known as Sector Wide Approach (SWAp) to fit in the country's vision 2020.

In Rwanda, education of all children (boys and girls) is seen as important for the development of the country. According to UNESCO report (2015), achieving the overall goal of promoting equality at all levels of education for all children – boys and girls - requires policy makers to devise means of addressing the economic, social and cultural barriers that keep tens of millions of children out of school, especially, the girl - child. Indeed, documented evidence by Hadden and London (1996) and Hanushek (2008) confirms that investing in girls' education delivers high returns not only for female educational attainment, but also towards achieving lower maternal and infant mortality rates, better child health, and improved economic growth. The GoR recognises the crucial contributions of women to economic development and it is expected that mainstreaming gender in all educational levels will be successful, since the government has demonstrated a strong commitment to promoting gender equality²⁴ with special emphasis placed on encouraging girls to enrol in science subjects (MINEDUC, 2003).

However, Rwanda, like many countries in Africa, still faces gender inequalities much as it strives to ensure equity in education. Although the government has put in place numerous policies in education, the number of girls accessing tertiary education is still low as compared to those who are enrolled in both primary and secondary schools. As such, many young women at this level have lagged behind in terms of accessing opportunities compared to boys (Mama, 2003; Mwingi, 2008). Among the factors accounting for these imbalances are social, cultural and economic challenges. As an example, some children coming from poor families do not easily access education. Additionally, as Buchmann, (2000) has also noted, larger families struggle to provide basic needs for their children. As a result, some parents often

²⁴ See GoR (2008a,2010); Abbott and Rucogoza (2011).

require children to acquire jobs at an early age so as to care for themselves and their young siblings. While financial implications affect both girls' and boys' participation in education, it is very likely that girls will drop out of school because of parents' poor economic status (see Egbo, 2000; Kane, 2004; Yaya, 2008). In Chapter Six, I have discussed how the poor financial situation of some parents often forces them to choose between whether they can spend their money sending their male or female children to school and later at university. Moreover, as girls tend to be expected to perform domestic duties, this affects the progress of their education (Yaya, 2008; Rugema, 2009; Abbott et al., 2010). Given such a situation, few women are schooled to higher levels of education (Husbands, 1972; King and Hill, 1993; Mama, 2003) as some parents will worry that 'too much' education may diminish the prospects of their daughters getting married (Broch and Cammish, 1997). According to Chege and Sifuna (2006), marriage for such young women is more likely to relate to obtaining a safe and economically supported household for themselves and their families. However, in many instances the reality is very different (Offorma, 2009) in that the girls do not escape from poverty and the parents have very little to show for the dowry paid to them (Offorma, 2009).

The above way of the moulding of roles among girls contributes to a deviation in the way women think and on who they want to become later in life (Tamale, 2004). I will return to this issue later in Chapter Seven while discussing the question of identity. In relation to this chapter, one needs to understand that given this evidence of unequal participation in the education sector, it is important to examine how government policies in the education sector mitigates gender gaps targeting all children especially girls and women to enter school and university and successfully pursue careers in fields that are traditionally set aside for boys including engineering, mathematics and architecture. In the following subsection, I examine how the government has mitigated gaps between girls and boys in accessing education at primary school level.

3.6.1 Access to Primary Education

The Government of Rwanda has developed policies, laws and strategies to work towards the promotion of gender equality at the primary level of education. In 2003, for example, Rwanda enacted the Education Sector Policy and approved the Ministerial Education Sector Strategic Plan (ESSP), the latter as an instrument for implementing the education policy. The

policy pledges key strategies to ensuring gender equality at all levels of education when it states that “there shall be no disparity in education, be it by sex, region, social group or other reason, the current achievements in regard to access of girls to primary and secondary education shall be safeguarded while strengthening their performance especially in science, mathematics and technology and the costs and wastage of disparities will be computed, and savings made will be devoted to the improvement of quality” (MINEDUC, 2003, p. 23).

All of these are in line with the Rwandan Constitution, Girls Education Policy, National Science and Technology Policy and National Gender Policy priorities. They also align with numerous international and donor policies in education and related sectors. As an example, the Department for International Development (DFID) sets three priority areas in education, namely: i) curriculum; ii) teacher training; and iii) choice of subjects. Specifically, on Rwanda, the DFID projects ensure that more girls and boys complete basic education (Paxton, 2012). Rwanda is actively committed to these policies as the discussions in this chapter reveal.

The adoption of such policies has seen Rwanda expand its access to primary education since 2003 when fees for primary school were abolished and replaced with public funding.²⁵ Hinged upon the French system,²⁶ primary education in Rwanda lasts six years. Children start primary school at 7 years and generally finish this level at 12 years of age. This stage of education focuses on core literacy and numeracy skills, as well as the preparation of children

²⁵ With the abolition of tuition fees in primary schools, the government introduced capitation grants to cater for the needs of children while at school. Every child is given a grant of about 3500RWF per term, which is paid directly to the school coffers. Although the government continues to provide these grants, some scholars argue that it is not enough as parents have to supplement what the government provides by buying uniforms, text books, paying examination fees and a contribution to the welfare of teachers through Parents and Teacher Association (PTA) activities (see, for example, Williams et al., 2014).

²⁶ Important to note is that before 2009, instruction at school in Rwanda was in French. Very few schools taught in English. After 2009, English was adopted as a language of instruction, not only in primary schools, but also in secondary and tertiary institutions. The goal of this language change was to integrate Rwanda into the East African Community (EAC) and Commonwealth. In addition to the above, adopting English in Rwanda was seen as a step towards acceleration of trade and tourism in the GLR and the EAC since other states use English as an official language (apart from Tanzania where Kiswahili dominates). Rwanda was to stand as a regional hub for business due to adoption of English as a language of not only instruction at school, but also communication (see Paxton, 2012) (see also Mbabazi, 2013).

for secondary school studies.²⁷The stage ends with national examinations, which yield eligibility for lower secondary education studies.

One significant issue relating to the main question of this study is the number of male and female children enrolled for primary education. As part of the bigger effort by the government to achieve gender equity in education, enrolments in primary schools have increased since 2008. What the MINEDUC Statistical Year Book (2015, p. 12) calls the “Gross Enrolment Rate (GER)”²⁸ in primary schools by 2015 is the percentage of both girls and boys attending school irrespective of their age. By 2015, the government projection of this number in percentage form was 135.3%, in 2016 it was 139.6%.²⁹ This implies that the net enrolment rate for children in primary schools in 2015 stood at the ratio of 97.4% for girls to 96.3% for boys. The ratio of enrolment for boys in 2016 was 97.3% to 98% for girls. More so, the difference in completion rates between girls and boys is not significant since it stands at 60.4%, with an average of 65.5% for girls and 55.3% for boys – although the government’s target for completion rate is 75% for both boys and girls. Furthermore, the dropout rates steadily fell from 14.3% in 2014 to 10.3% in 2015. By 2016, the general completion rate was 65.2% (MINEDUC Statistical Year Book, 2016).

Considering the above figures, there is no significant difference between enrolment in primary schools between girls and boys in Rwanda. Further still, as of 2014, there was a slight difference in dropout rates between boys and girls. While the dropout rate for boys was 11.1%, the one for girls stood at 9.6%. This also does not suggest a sharp difference between girls and boys as far as dropping out of primary school is concerned. Besides accessing education at primary level and dropping out of school in 2015 as outlined above, one also does not see a major difference between the two genders. From these figures, I deduce that post-genocide Rwanda has registered significant success in gender equity in education at primary level as both girls and boys are able to access school, complete in big numbers and

²⁷ Although children joining primary education are instructed on core literacy and numeracy skills, they also study other subjects. Between Primary 1 and 3, children study Kinyarwanda, English, mathematics, social and religious studies, science and elementary technology, creative arts, music, fine art and crafts as well as physical education. From Primary 4 to Primary 6, children study all the above subjects in addition to French, which is introduced in Primary 4 as a subject (MINEDUC and Rwanda Education Board [REB], 2015).

²⁸ GER denotes the total number of learners enrolled at a particular primary school irrespective of age, gender and ethnicity.

²⁹ Although the figures achieved have progressively improved between 2015 and 2016, they are behind the government ESSP target of 2016/2017. The government’s target is 106 %.

are able to transit to secondary school level. It is pertinent that I also examine how the situation stands at secondary school level to which I turn in the following subsection.

3.6.2 Secondary Education

While Rwanda has actively pursued several Millennium Development Goals including closing the gender gap in primary and secondary education enrolment, there has been sustained progress in access to education with the secondary school enrolment figures standing at 52.9% for girls and 47.1% for boys in 2016. In Rwanda, secondary education takes six years. More so, this level of education comprises two stages, that is to say lower and upper secondary. Lower secondary is made of senior one to senior three and children joining this level are usually aged 13 years. On the other hand, upper secondary is composed of classes between senior four and senior six, with students under this level ranging between 15 and 18 years. Students at secondary level study several subjects: in lower secondary, compulsory subjects include English, Kinyarwanda, mathematics, physics, chemistry, biology and health sciences, information and communication technology, history and citizenship, geography and environment, entrepreneurship, French, Kiswahili and Literature in English. On top of these subjects, which are compulsory in all public schools, there are also, what are called elective subjects including religion and ethics, music, dance and drama, fine art and crafts, home sciences as well as farming (agriculture) and animal husbandry. Each school is expected to choose one subject from this latter category.³⁰

When a student reaches upper secondary level, he/she picks on a subject combination whether in sciences, arts/humanities and languages.³¹ In addition to the subject combinations, students are expected to study entrepreneurship, general paper and communication skills. It is important to note that students who opted for science combinations³² and economics but without mathematics as one of the subjects are obliged to study mathematics. On the other

³⁰ There are also co-curricular activities such as physical education (PE) and sports as well as library and clubs. These co-curricular subjects are compulsory in all schools – both public and private schools.

³¹ There is also a provision for students who do not want to proceed to upper secondary but are interested in joining either teacher training colleges or technical institutions. Students who join teachers' training colleges after completing lower secondary become primary schoolteachers. However, after completing upper secondary and failing to join university, some students opt for colleges to do courses like teaching, nursing, catering, just to mention a few of these courses.

³² What I have regarded as science combinations is a situation where a student chooses three or four subjects including physics, chemistry and biology (PCB) and biology, chemistry and geography (BCG).

hand, students studying language combinations (for instance Literature in English, French and Kinyarwanda) are expected to take up a fourth language as a minor. This fourth language could be Kiswahili.³³

Each of these levels at secondary school ends with a national examination. At senior three for example, students sit for ordinary level examinations. The student who passes is eligible to join upper secondary level, which begins at senior four. Upon attaining senior six, there is also a national examination, which must be passed before proceeding to university. Statistically, 48.1% of boys attend upper secondary compared to 51.9% of the girls (MINEDUC Statistical Year Book, 2016). The following statistics show the gender composition in relation to science subjects taught at upper secondary level in Rwanda: Out of a total of 75,276 students registered in the academic year 2016 for science subjects between senior four, senior five and senior six, 55% were females while 44.5% were males. This improvement in the enrolment rate of females at upper secondary level is a result of the government's interventions to boost girls' education in science and technology. These interventions include reviewed teaching methods and assessments of learning in secondary schools as well as remedial courses for girls who wish to enter male-dominated fields of study such as studying mathematics, biology and physics. Another intervention relates to the 'free tuition for 20 girls every year who qualify for science and technology training and education' (GoR, 2008a, pp.14-15).

Despite the interventions enumerated above, the number of girls who study science courses in tertiary institutions (particularly University of Rwanda) is low at 33.7%). In the following subsection, I give background information on tertiary education in relation to gender and science. This information enhances an understanding of how young women negotiate their way to pursue careers in science at university as discussed in Chapter Seven.

3.6.3 The Situation in Tertiary Education

Significant progress has taken place in the expansion of the higher education system since 1994 with increasing enrolments of students to universities (GoR, 2008b). Soon after Rwanda got independence, higher education was not given due attention. Like other young independent states, Rwanda did not have a fully-fledged national university. The World Bank

³³ Like it is the case at lower secondary level, students at upper secondary level are expected to participate in co-curricular activities such as clubs, sports and physical education.

report (2004) on education in Rwanda points out that the first institution of higher education in Rwanda was the diploma-granting institute known as Grand Seminaire de Nyakibanda, established in 1936. This institution was established to train men in priesthood. As this World Bank report narrates, people who wanted to pursue higher education during the colonial period in Rwanda would go to the Democratic Republic of Congo (DRC) or Belgium.

However, in 1963, the newly independent Rwandan state, under the leadership of President Gregoire Kayibanda, set up the National University of Rwanda. The setting of this university was a result of the collaboration between the GoR and the Dominican fathers from Quebec province in Canada. At its inception, this university had about 50 students. However, by the end of 1980s, the number of students had risen to 3000 and ‘women accounted for less than 18% of the total enrolment’ (World Bank, 2004, p.138). As noted in this World Bank report, the National University of Rwanda started with the faculties of medicine, economics and social sciences. There was also the teacher training college, known in French as Ecole Normale Supérieur. As time went on, this university grew to include the faculties of law, applied sciences and agronomy.³⁴

Scholars including Melvern (2000) and Obura (2003) point out that admission to the National University of Rwanda during the first and second Republics was based on ethnic lines. In other words, it depended on whether one was a Hutu or Tutsi. More so, since political power was under the Hutu, these were allocated more slots than their Tutsi counterparts. In fact, Melvern (2000) and Obura (2003) note that the Tutsi were allocated 9% of the total slots to join university while the Hutu took 90% and the Twa had only 1%. Although the gender question was significant in accessing university education in Rwanda during the first and second Republics, this was overshadowed by the ethnic question. This means that ethnicity was at the centre in determining who could acquire university education.

This system was on until 1994 when a genocide to exterminate minority Tutsi and moderate Hutus erupted. The genocide eroded the country's human resource and infrastructure. Obura (2003) observes that the National University of Rwanda was among the primary targets of the genocide perpetrators. By the time the genocide was stopped, about 153 members of staff for this university had died, 106 disappeared and 800 fled the country. With the country’

³⁴ By the time of compiling this thesis, there was no literature (documentation) on the gender composition on the subjects offered at this university during its inception in 1963.

traditionally weak education system, the immediate post-genocide Rwanda was in need of skilled and qualified personnel to work towards national recovery. More so, there was urgent need of manpower to work as university staff.³⁵ The RPF government since taking over power in 1994 pursued plans to expand the higher education system by ensuring that those who have been barred from attaining an education “most notable people with disabilities and those from remote rural areas benefit from higher education” (GoR,2008b, p.13). At the same time, the government revisited the discriminative policies that had been introduced during the first and second Republics through which the government had provided education based on the ethnically motivated quota system. The new government after the genocide underscored the idea of providing education on merit. This implied that whoever sat and passed upper secondary school level examinations was free to join university.

Upon taking over power, the new government started three new higher institutions of learning, which also offered degree and diploma courses. These new universities included Kigali Institute of Science and Technology (KIST), Kigali Institute of Education (KIE) and Kigali Health Institute (KHI) (Obura, 2003). Together with the already existing public educational institutions (including the National University of Rwanda, Institut Supérieur d’Agriculture et d’Élevage (ISAE) and Institut Supérieur de Finances Publique (ISFP), Rwanda boasted of six public institutions of higher learning by 1999. Besides these institutions, there was also Umutara Polytechnic that was started in the year 2000.

In a bid to further improve the quality of education offered in the higher learning institutions, the government tabled a bill in parliament in 2012 that sought to have public universities in the country merged to form one institution of higher learning. Thus, the establishment of one national university was mooted as one of the approaches to the restructuring of the public education sector in Rwanda. This was seen as an opportunity to reposition the higher education sector as a way of meeting both national and global challenges of development. To this, University of Rwanda, which resulted from the merger of seven public higher learning institutions, became operational in September 2013. At its inception, this university boasted of six specialised colleges; namely the College of Science and Technology, Agriculture and Veterinary Science, Medicine and Health Sciences, Business and Economics, Arts and Social

³⁵ With the shortage of qualified Rwandans to work in higher education, the country then relied on expatriate staff in higher education institutions but today the government has the urgent need to build the capacity of local staff.

Sciences as well as Education. Together, statistics show a significant increase in the participation rates amongst young people in higher education. The participation numbers in both public and private higher institutions rose to 90,803 in 2016. Specifically, in private institutions, there are 51,595 as opposed to 39,208 students in public institutions (MINEDUC Statistics Year Book, 2016).

Despite the progress in numbers of young people entering higher education, enrolment rates are lower for girls compared to boys. About 30% of girls were enrolled in public³⁶ higher education institutions in 2016 as compared to 70% of boys. These figures indicate low transition rates for girls from secondary to tertiary level. Significantly, whilst girls' enrolment (98%) is at a slightly higher rate than boys' 97.3% at the primary, lower and upper secondary levels, they lag behind boys in accessing university education. According to the MINEDUC (2010) report, this low transition to university is mainly a consequence of the poor performance of students during the national examinations done at the end of upper secondary level. Another factor for this underrepresentation of young women at university is related to teaching practices at the secondary level. As pointed out in Chapter Six, schools are also a site of concretising gender relations as teachers can encourage or discourage learners to excel in particular subjects during examinations.

To say that schools are critical spaces of learning in which notions of gender stereotypes can be either reinforced or contested is not an understatement.³⁷ Much as several factors account for the low levels of women's enrolment in science courses, the notion of classifying certain subjects as masculine and others feminine (Francis, 2000) becomes a significant factor in influencing choices by young men and women while building careers at universities. According to Acker and Oatley (1993), science is not seen as congruent with female sex-role identity. This relates to the daily discourse on roles expected of women and men in homes and structuring every aspect of life to resonate with these roles. In this regard, young women are socialised into careers that are geared towards ensuring that they translate into people that

³⁶ Majority of women who do not achieve the grades to acquire government scholarships, they usually repeat upper secondary level in order to be admitted for the courses of their choice at public institutions. However, others opt for private institutions, which charge tuition fees and other requirements. According to the MINEDUC Statistics Year Book, 2016, the percentage of young women attending private institutions is as high as 51.8% as compared to that of males standing at 48.2%. It is important also to note that education in public institutions of learning is not completely free. Students whose parents fall under category 4 of the *Ubudehe* classification of social classes are expected to pay full fees for their children while those who fall under category 1 and 2 do not pay anything. For further discussions on this issue, see Chapter Six.

³⁷ See Delamont (1980); Thorne (1993); Aikman et al. (2005) and Mlamba et al. (2005).

will sustain families through cooking and caretaking. On the other hand, men are usually socialised into careers that make them occupy positions of prestige, power, opportunities and wealth (Epstein, 1970; Tamale, 2004). To this end, several writers share the experiences of some women who have attempted to pursue science programs in universities but dropped out. The numbers of such women giving up on the careers they tend to build is higher opposed to men (Brush, 1991; Bradley, 2000). Scholarly work reveals that universities do not offer an enabling environment for gender equity in developing science careers. As Acker and Oatley point out, “women have made relatively few advances to study science subjects [at university and] there is need to question the assumptions and structure of higher education, particularly as it devalues aspects of woman’s existence in the pursuit of economic advance” (1993, p.260). Other themes that have preoccupied feminist scholars in this area include the sexist humour and language used in the university context, textbooks that omit women’s contributions in areas of science scholarship (Kelly, 1985; Rossiter, 1993) and the scarcity of female role models and mentors (Nolan, 1992; Etzkowitz et al.,1994; Cozza, 2011; Steele et al., 2013) are among the factors that affect women’s quest to study science subjects at university.

3.7 Conclusion

In this chapter, I have presented the geographical, economic and political situation of Rwanda with the intention of giving a contextual background to the subject of gender and education in Rwanda. Specifically, the chapter has traced the pre-colonial, colonial, independent and post – genocide Rwanda to understand how these situations impacted on accessibility of both men and women in education.

By discussing government policies and other national and international instruments geared towards gender equity in education, I have demonstrated how Rwanda takes education for both women and men as a significant resource for national development. More so, the chapter has demonstrated how post- genocide Rwanda stands out as a period during which gender equity was championed to allow women to participate in all spheres of life including decision-making and education. Indeed, from primary through secondary to tertiary level, the post-genocide government of Rwanda has worked to ensure gender equity in education. This chapter reveals that like other patriarchal societies, the Rwandan society also has deeply rooted social stereotypes in relation to women and men and these continue to impact on how

women and men are treated in society. In this chapter, it implicitly comes out that certain careers are constructed as masculine while others are constructed as feminine.

Finally, it can be concluded that with the intervention of the government to ensure gender equity in education since the aftermath of the genocide in 1994, more girls have gone to school. Specifically, more girls especially at upper secondary have enrolled for science subjects. However, there remains deeply rooted social stereotypes about the expected roles of girls and boys in society. Girls are still expected to perform roles that resonate with the private sphere as mothers and wives while boys are expected to perform roles that present them as public figures. To this end, there is need for the government to come up with more policies to remove these stereotypes. Rwanda, like many countries in Africa, still faces gender inequalities much as it strives to ensure equity in education. Although the government has put in place numerous policies in education, the number of girls accessing tertiary education is still low as compared to those of boys who are enrolled in both primary and secondary schools.

In the next chapter, I discuss the methodological approaches that I adopted to conduct this study.

Chapter Four

Research Methodology

4.1 Introduction

This chapter discusses the methodology adopted to explore the way young women negotiate gendered constructions while pursuing an education in science at university in Rwanda. By drawing on a feminist perspective, the chapter explains the link between the methodological and theoretical framework that informed the research. This chapter also explores the process followed to select the study population, the various phases of the study, and the different tools (methods) used to collect the data. Moreover, I highlight some of the challenges encountered and how they were mitigated during fieldwork.

Like any other research involving interaction with human beings, this study presented numerous ethical issues, which I also discuss in this chapter. I have arranged the chapter into twelve sections. Section one introduces the methodology adopted for this study, while the section that follows deals with the influence of feminism on this study. Section four is a discussion of the case study design, and section five deals with the scope of the study – demonstrating the extent to which the study has gone in terms of geographical and content scope. Then, I discuss how I gained access to the field, sampling techniques, data collection methods, insider/outsider identities, ethical considerations, and the way the data was analysed. In the section that follows, I discuss the methodology adopted for this study.

4.2 Qualitative Research Methodology

A qualitative methodology was adopted for this research. As Merriam (2002, p.3) explains, qualitative research is conducted against a backdrop where “meaning is socially constructed by individuals in interaction with their world”. The qualitative research methodology assumes that reality is not something fixed, single, or an agreed upon or measurable phenomenon, rather, there are “multiple constructions and interpretations of reality that are in flux and that change over time” (Ibid, pp.3-4). From this perspective, adopting a qualitative research methodology means sharing people’s ideas and experiences, in order to understand how a phenomenon is perceived within a particular community. According to scholars such as Holliday (2007), Creswell (2009), and Maxwell (2013), a qualitative research methodology calls for an understanding of the way people within a particular community experience and interact with their social worlds. In the same vein, in discussing a qualitative research

methodology, Denzin and Lincoln (2008, p.4), note that it “consists of a set of interpretive material practices that make the world visible. These practices transform the world [... and] turn the world into a series of representations”.

As such, the adoption of a qualitative research methodology within the interpretivist paradigm was appropriate for the present study because of the subjective nature of meaning derived through interaction with the research participants. Denzin and Lincoln outline how an interpretive approach to qualitative research entails studying phenomena in their “natural settings, attempting to make sense of, or interpret, phenomena in terms of the meanings people bring to them” (2008, p. 4).³⁸ By interacting with young women in different settings as well as the university premises, I shared their experiences and ideas regarding their negotiations of gendered constructs while studying science at university. I have analysed these experiences and ideas in order to acquire detailed interpretations of young women’s struggles in pursuing careers in science in Rwanda. In summary, I have adopted a feminist perspective as well as the interpretive qualitative approach, to understand women’s experiences of studying science, a predominately male discipline, at university.

4.3 Feminist Research

Stanley and Wise (1993, p.52), in their work on feminism, define feminism as the “political movement of women’s response to their [...] oppression”, and outline “women’s oppression as including psychological and biological aspects as well as the economic structures which contribute to [...inequality of the sexes]” (Ibid). Similarly, Brooks and Hesse-Biber (2007, p.3) state that “femini[sm] concerns itself with issues of social justice and social change for women”, while feminism for Acker (1987), serves to highlight gender inequalities and how to overcome them. Based on these assertions, it is important for feminist approaches to bring to the fore the social, economic, political and educational inequalities between men and women in society, as well as to advocate for equality between the genders.

In addition, feminist research is preoccupied not only with liberating women from all forms of oppression in society, but also with changing their lives.³⁹ In this regard, Brooks and

³⁸ See also Creswell, (2009) on the same idea. He discusses how qualitative researchers should build a complex, holistic picture, analyse words, report detailed views of participants, and conduct their studies in a natural setting, in order to acquire the relevant insights.

³⁹ See Crawford and Kimmel (1999) and Rowbotham (2013).

Hesse-Biber (2007, p. 6) argue that “feminist research goals foster empowerment and emancipation for women and other marginali[s]ed groups, and feminist researchers often apply their findings in the service of promoting social change and social justice for women”. For these reasons, the present study takes a feminist approach, as women’s experiences are the focal point of the research and data collection.

To feminists, personal experience cannot be invalidated or rejected, implying that women should have a voice with which to articulate their individual lived experiences.⁴⁰ From such a perspective, society views women as inferior and subordinate, as people who should be under the control of men; in this case, there is a need to provide a platform for women to voice their concerns and ideas about what it feels like to study science as a woman.

It is against this backdrop that feminists have advocated for the adoption of techniques that eliminate the oppression and domination of research participants. As Merriam (2002) argues, much of feminist research applies a qualitative research methodology because scholars are keen to understand why certain social structures are in place, enabling men to relegate women to the periphery whilst they advance their own interests. In addition, Merriam also accurately notes that the “interests of some members and classes of society are served and perpetuated at the expense of others” (Ibid, p. 4), a phenomenon that demands scholars’ understanding. Thus, three methodological viewpoints stand out in this research. According to the ideas of feminist methodology, Stanley (1993) provides us with a set of guidelines that must be addressed when conducting feminist research, namely: i) oppression of women; ii) personal experience; and iii) possession of feminist consciousness. It is the general view within the feminist agenda that the key concern is how to further support for women studying science degrees at university. As Stanley and Wise (1993) stress, acceptance of such a perspective proves that there is a problem in need of addressing. In addition to the question of women’s oppression, there is the need to share the personal experiences of the women encountered during research. In this regard, Stanley and Wise (1993) implore researchers to recognise that personal experience underlines the behaviours and actions of the individual. In other words, researchers should provide a platform upon which participants can share their experiences. The last theme that the scholars engage with in studies such as this is feminist

⁴⁰ See Rigers (1992), Maynard (1994), Griffiths (1995), and Harding and Hintikka (2003), who’ve argued against the traditional male view that only one truth about a phenomenon exists.

consciousness which relates to the expression of women's unique views on social reality. The investigator needs to have an understanding of the oppression of women and work towards eliminating the power relations between the researcher and the participants. Furthermore, the investigator's behaviour when conducting research can impact on the data presented, a view that is summarised by Stanley and Wise as follows,

The kind of person that we are, and how we experience the research, all have a crucial impact on what we see, what we do, and how we interpret and construct what's going on (Stanley and Wise, 1993, p. 60).

The guidelines advocated by Stanley and Wise are largely qualitative in nature, and the notion of subjectivity continues to provide an epistemological grounding for the qualitative research approach used in the present study. In addition, the above ideas of Stanley and Wise underscore the need for researchers engaged in similar studies to be conscious of their behaviour and the decisions they make while conducting research on women's issues.

Influenced by these views, especially the need to approach feminism through what Mauthner calls "multi-layered voices" (1998, p.1), I conducted this study with the aim of empowering participants, to give them a stage upon which to present a multiplicity of lived experiences with regard to studying science at university. As a feminist researcher, I also had to immerse myself fully in the research process, incorporating my own experiences into the research in order to break down the power relations between the researcher and the participants (Griffiths, 1995). Despite my role as a PhD student placing me within the research process, I felt that my ideas and experiences as a Rwandan woman would contribute to my understanding of women's experiences of education and their study of science subjects at the University of Rwanda.

As a matter of fact, reflexivity in the context of this study is crucial in exploring such experiences. According to Mauthner and Doucet (1998), when a researcher engages in reflectivity, they reflect on the process of creating, interpreting and theorising data (see also, Stanley and Wise, 1990; Fonow and Cook, 1991; Hesse- Biber, 2011, Miles et al., 2014). Griffiths (1998) also states that reflexivity heightens a researcher's self-awareness while they are producing accounts of the research from the beginning of the study to the final report. As will be explained later in this chapter, my experience and identity in this study was pertinent in the process of collecting and analysing data.

In the section below, I discuss the extent to which the case study design enhanced the data collection during the first phase and the main phase of this study. I also justify the reasons for choosing the College of Science and Technology at the University of Rwanda for this study.

4.4 An Interpretivist Case Study Approach

This research employed a qualitative case study approach to conduct the fieldwork. In this regard, Stake (2008), suggests that case studies have become a ‘common way to do qualitative inquiry’ (p.119), while Baskarada (2014) views the adoption of a qualitative case study as “involving a deep holistic view of the research problem” (p.1). In other words, a case study is a credible strategy to use in this research project.

Numerous descriptions of case studies exist. For example, Yin (2009) views a case study as an “empirical enquiry that investigates a contemporary phenomenon in-depth and within its real-life context” (p.18), whereas Creswell (1994) believes that a case study is an approach employed by researchers to explore a “single entity or phenomenon bounded by time and activity and collects detailed information by using a variety of data collection procedures during a sustained period of time” (p.12). The above definitions qualify a case study as a methodological approach used to investigate issues related to individual lives, institutions, policies, events and managerial processes (Yin, 2009). In conceptualising case study research as a “bounded system”, Creswell (1994) is highlighting the fact that the subject of investigation can be studied within a specified period of time, place or physical boundaries. In other words, time limits can be imposed on the subject of investigation (Merriam, 2002).

Following Yin’s (2009) perspective, I chose a case study as it involves understanding people’s everyday lived experiences within a specific area. In the present study, such an approach enhances the understanding of young women’s experiences of studying science courses at university. I selected the University of Rwanda’s College of Science and Technology as the site for my research for the reasons explained on pages 51-53. Yin also advises that the case study method should be adopted as “[it helps one]” to understand a real-life phenomenon in-depth with such understanding encompassing different contextual conditions’ (2009, p.18). At the same time, the selection of a case study is based on the purpose of the research and the theoretical proposition of a given study: in this case, the

present study was guided by theoretical perspectives of feminism, focusing on the lived experiences of young women studying sciences at university.

In this study, I also used what Yin (2009) refers to as an embedded single case study design to explore the experiences of female students studying degree programmes at university [single case]. Sub-units of the principal's office, registrar's office, affiliated schools of study, deans of schools, lecturers, students, and parents were embedded within the case study. This type of approach enables a "number of sub-units each of which is explored individually to be drawn together to yield an overall picture" [of the study] (Rowley, 2002, p. 22).

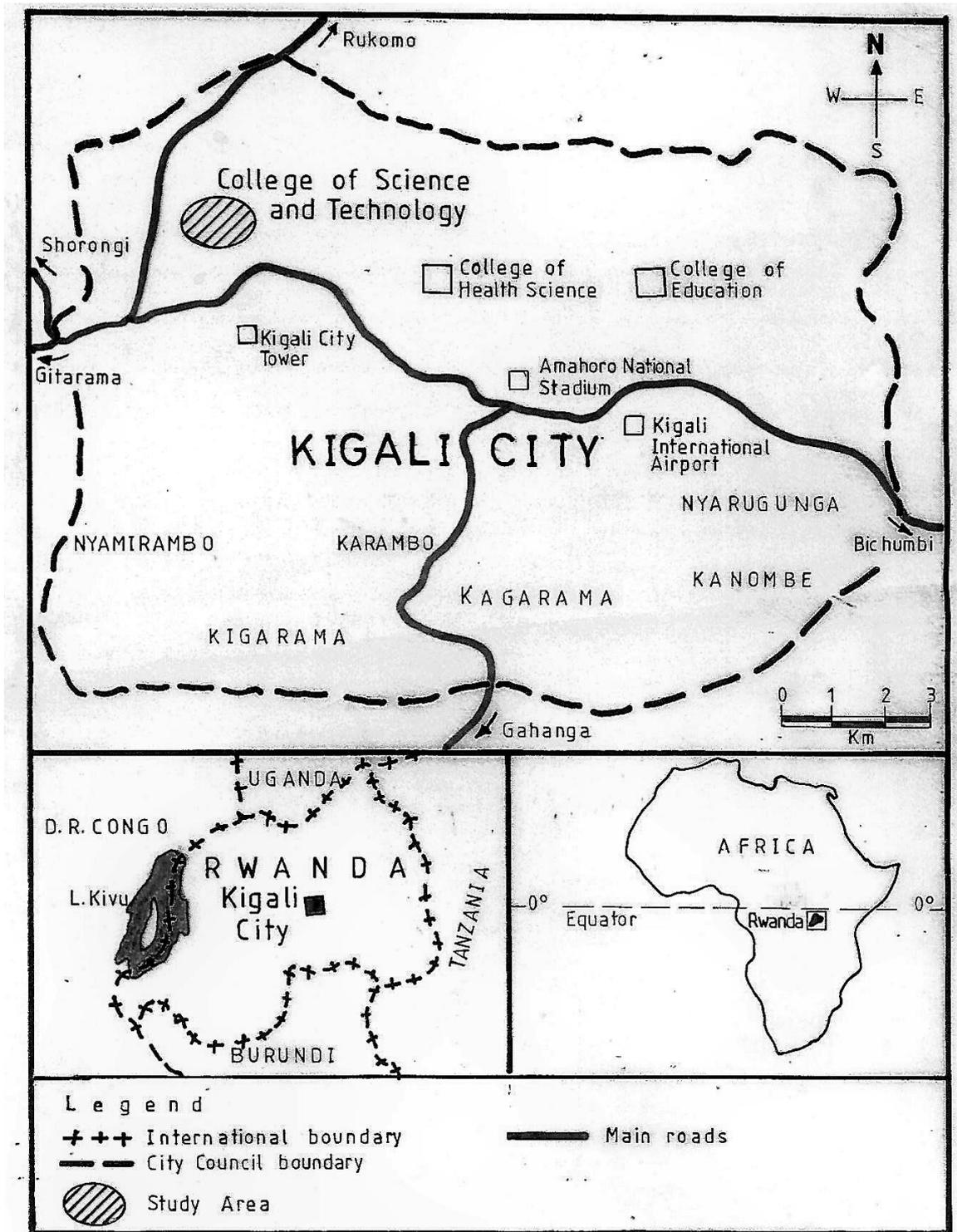
The advantage of this approach lies in its potential to enable the researcher gain in-depth insights into women's experiences of studying science courses at university, as the case of the University of Rwanda's College of Science and Technology portrays. Despite the many positive aspects of a single case study research approach, critics of this approach would consider the selection of a single case study ineffective because of its dependence on small samples, which is believed to render it incapable of generalising conclusions (see Stake, 2008; Yin, 2009; Merriam, 2009; Stewart, 2014). Denzin and Lincoln note that like many other research approaches, a case study also involves a combination of methodological practices, empirical materials and perspectives in a study. As these scholars have argued, this approach adds rigour, breadth, complexity, richness and depth to an inquiry (2008, p.16). This idea implies that the use of different kinds of data in a case study allows for the possibility of describing and gaining detailed understanding about the research problem being studied (see also, Baxter and Jack 2010; Baskarada, 2014). As discussed, the data for this study were collected through semi-structured interviews, diary and documentary analysis. The participants were female and male students, male lecturers and parents of children at the university.

Unlike the scholars who criticise this approach due to cases being taken as single examples and not as representative of the entire phenomena, such an approach was employed in this study in order to gain a deeper understanding of young women's experiences of studying science at university (Lewis and Ritchie, 2003; Silverman, 2005; Crowe et al., 2011).

4.5 Scope of the Study

This research study was conducted in Rwanda, specifically at the University of Rwanda College of Science and Technology. Figure 1 below is a map showing the area where this study was conducted.

Figure 1 : Location of the University of Rwanda’s College of Science and Technology



Source : Fieldwork by the Researcher

The research took place at the University of Rwanda College of Science and Technology (URCST).⁴¹ This College was formerly established in 1997 by the GoR with support from development partners such as the United Nations Development Programme (UNDP) and the German Technical Cooperation Agency (GTZ) as the first higher education institution to offer courses in technology.⁴² Officially, the College was inaugurated in 1998 and legally enacted by law in 2001. According to Lwakabamba and Lujura (2003), when the genocide took place in 1994, most of the technical experts were killed or went to neighbouring countries where they sought refuge. Consequently, there were hardly any qualified and experienced experts in the remaining technical, scientific, administrative and managerial domains that the country could rely on (see also Butare, 2004). The College opened then with three major programmes being offered in engineering, computer science and management.⁴³ Because of the restructuring of the university in 2013, this College comprises of several schools with the major ones being School of Science, School of Engineering, School of Mining and Geology, School of Architecture and the Built Environment and the School of Information and Communication Technology.⁴⁴ Each of these schools offers different programmes. For example, the School of Science offers subjects such as mathematics, physics, biology, chemistry and geography, while the School of Architecture and the Built Environment offers architecture, creative design, construction management, and estate management and evaluation. Furthermore, the School of Engineering offers civil engineering, water and environmental engineering, electrical engineering, mechanical engineering, surveying and geomatic engineering, building and construction technology, electronics and telecommunication engineering, and computer engineering.

⁴¹ Although my participants were taking courses from the College of Science and Technology at the University of Rwanda, one of them (Belinda) was studying food science and technology, a course offered at the University of Rwanda's College of Agriculture, Animal Sciences and Veterinary Medicine (URCAVM). However, by the time I conducted this study, the Food Science and Technology degree course was under URCST. It was later changed and put under URCAVM during the university restructuring activities of 2013. For more details, see the 'Education Sector Strategic Plan for the Ministry of Education', 2013.

⁴² For more information, see <http://www.cst.ur.ac.rw/index.php/about-us/our-history>.

⁴³ It is important to note that the College of Science and Technology taught management as a degree course until 2005. On 4th May 2005, the Rwanda Cabinet decided that the Faculty of Management at this College would be transferred to the University of Rwanda's College of Business Studies [URCBE] (formerly known as the School of Finance and Banking). The URCST was required to introduce only natural science disciplines. From 4th May 2005 to September 2013, the URCST offered programmes in engineering, science and technology (see more details in Lemarchand and Tash's work on 'Mapping Research and Innovation in the Republic of Rwanda', 2015).

⁴⁴ See <http://www.cst.ur.ac.rw/index.php/academics/our-schools>.

In addition, the School of Mining offers mining and geology as the main programme of study. Finally, there is the School of Information and Communication Technology, which offers subjects like computer science, information technology and information systems.

The establishment of the College in 1997, which came three years after the war and the genocide, was a manifestation of the strong commitment the GoR had to education. The initial ties between this College and the GoR provided evidence of the role of higher education in rebuilding a post-genocide Rwanda. This idea is also captured in the Higher Education Policy in the following statement: “In recognition of the essential role that higher education can play in enabling the country to overcome poverty and avoid social and political crisis, the building of higher education has been a priority for the post-genocide government [... As a result ...] much progress has been made with significant investment in developing higher education [...] by government” (GoR, 2008b, p. 5).

To understand how young women, strive to pursue careers in science in Rwanda, it was pertinent to choose the College of Science and Technology. The College’s establishment in Kigali, the capital and administrative city of the country, made it an ideal location for this study, as I was able to access the place easily due to the availability of transport and easy communication, factors that enhanced the field study. Furthermore, as someone who had previously taught at one of the higher education institutions in Rwanda, I knew many people at this College who would give me information for this study. To take an example, several lecturers in the School of Engineering and Science at this College had been colleagues during the time I worked on an Education for Sustainable Development (ESD) in Higher Education project.⁴⁵ I worked on this project when I was an assistant lecturer at the University of Rwanda’s College of Education, and I would meet and interact with the above officials, thus developing a friendship with them. Besides the above contacts, the fact that I had conducted my master’s research at the College of Science and Technology gave me an opportunity to interview several young women studying sciences at university. Before conducting the

⁴⁵ I attended an international training programme on ESD in Higher Education organised by the Swedish International Development Agency (SIDA). It took place at Uppsala University and Gothenburg University in Sweden and Rhodes University in South Africa. As part of the training, I was able to develop/work on a one-year change project that was relevant to the aims and objectives of ESD within a university context. Since I was based at the University of Rwanda’s College of Education, I had an opportunity to interact with colleagues from Africa and Asia, particularly the officials from my university in Rwanda.

present study, the young women whom I had met during my master's studies became my initial contacts, thus motivating me to return to this College for my PhD research.

University of Rwanda's College of Science and Technology focuses mainly on offering courses in science, technology and engineering both at diploma, degree and master's levels. The institution's undergraduate degree framework has five levels: level one for the first year of the full-time undergraduate course, level two for the second year, levels three and four covers the third year and level five for the fourth and final year. At the end of level five, students are awarded a degree certificate.⁴⁶ As per the admissions policy of the institution, it enrolls both males and females who have completed their sixth year of secondary school level (A levels) onto its degree courses.⁴⁷ As such, I was aware of the fact that choosing this College would allow me to interact with young women studying sciences in all these levels to share their experiences. In addition, my motivation for choosing this research site came from the fact that the College of Science and Technology is not only a specialised institution offering higher education in science courses at the national level but is also positioned within a global context to provide education that can enable its graduates to compete globally. This viewpoint relates to Yin's idea of a 'generalising' and not a 'particularising analysis' (2009, p.15) when choosing sites for case study research projects.

⁴⁶ The Institution offers the degree as per the general academic regulations, which are in line with the Rwandan National Qualifications Framework for Higher Education Institutions (See Rwanda's Higher Education Council, 2007).

⁴⁷ Although the GoR has come up with policies that call for increased enrolment in all levels of education, those seeking university education must acquire specific grades. In other words, female and male students should be able to possess a good certificate of advanced secondary education to be enrolled in URCST and other post - secondary institutions in the country. In relation to URCST, the basic entry requirements for admission include attainment of two principal passes with at least 24 points in the subjects one has studied. Other tertiary institutions teaching arts and humanities require that the applicant has at least two principal passes and 18 points in the subjects one has studied at advanced level. For further information on the latest entry points for admission into URCST, see <http://ur.ac.rw/?q=content/call-applications-undergraduate-programmes-ur>. See also similar discussions in chapter six dedicated to a discussion on admission requirements to join the University of Rwanda.

4.6 Gaining Access into the Field

4.6.1 Gaining Access to the University and the Participants

That this study involved what could be referred to as pre-fieldwork activities is manifested through the review of the relevant literature, preparing interview guides for the different categories of people to be interviewed, writing of letters to seek permission to do fieldwork as well as making contact with participants. Writing about qualitative research, Feldman, Bell and Berger implore scholars to be careful as they prepare to gain access into the field. As they write, ‘access is a critical part of doing research, not only because one must “get in” in order to gain information but also because the process of “getting in” affects what information is available to the researcher’ (2003, p. vii). As such, the activities involving preparation of interview schedules, writing letters and seeking permission, among others, were designed to prepare the researcher to gain access to the field. As mentioned in section 4.5 above, fieldwork for this study took place at the College of Science and Technology in Kigali, the capital city of Rwanda. In order to have a deeper understanding of the experiences of young women studying science courses at this university, I designed the research in two main phases, namely, i) the first phase of the research; and ii) the main phase of the study. In the following subsection, I enumerate the main activities that formed the first phase of this study.

4.6.2 First Phase of the Study

As a way of familiarising myself with the situation in Rwanda in relation to the current research, I conducted the first phase of this study in Kigali during the summer of 2013. This was after receiving approval from the Internal Ethics Committee of Canterbury Christ Church University (CCCU). This approval gave me the opportunity to spend two months in Rwanda undertaking this study as a way of laying the foundation for the main phase of my research. In this section, I describe the processes that I went through while conducting the first phase of this study and how this informed the study in terms of ethics, choice of participants, research tools, confidence in conducting interviews and how to mitigate the various limitations that come with the study, such as that undertaken for this thesis.

The first thing I did when I arrived in Rwanda was to follow up on the permission letter, I had sent to the College of Science and Technology, University of Rwanda, to conduct the research. Not only was this permission (which comes later in the form of a research permit)

intended to enable me to become affiliated to the College of Science and Technology - URCST (formerly Kigali Institute of Science and Technology) [KIST] as a researcher, it was also intended to give me a legal identity as a researcher in the country (see Punch, 1994; Delamont, 2002). To get this letter, I had to submit an affiliation letter from URCST, an ethical clearance letter from CCCU, as well as the interview agenda designated by the researcher for the different categories of people to participate in this study (lecturers, parents and students) and the PhD research proposal to the directorate of science, technology and research under the Ministry of Education.

After obtaining the research permit, I embarked on the process of making contacts at the university. However, this could not have materialised before knowing the person who was to be in charge of my research activities at University of Rwanda's College of Science and Technology. Upon presentation of the research permit, a member of the academic staff of the department of food, science and technology, Dr Hilda Vasanthakalam, was assigned to me by the principal of the College (formerly known as the rector) as the person I should liaise with as I did my research at University of Rwanda's College of Science and Technology.⁴⁸ It was this research contact person who gave me the permission to get in touch with the university's student representatives (guild officials) of the university who would also help me to get the students I would interview for my research.

Having had contact with students from the guild representatives, it was necessary to get in touch with the university lecturers for an interview. As someone who had worked on projects at the URCST, I had already known some professors there. As such, I had to contact them to help me get in touch with other lecturers to see if they could be participants in my research. Furthermore, I had to look for ways to involve parents, as there were essential to supplement the information that was given by the students.

4.6.3 Main Phase of the Study

Having completed the first phase of fieldwork in September 2013, I returned to CCCU to analyse the collected data and continue writing my preliminary chapters. Following this, I organised another trip back to Rwanda to carry out the main fieldwork. This main fieldwork was conducted in October, 2014. On my arrival in Rwanda, I visited URCST to reconnect

⁴⁸ See appendix 6, which is a letter written by the head of the College, introducing me to the contact person who was to help me in locating my participants.

with my respondents and to explore opportunities of meeting new people from whom I could get more data. Some of my contacts at URCST were the female and male students I had spoken to during the first phase of the study including Nelly, Claudine, Brenda and George. Lecturers such as David and Paul⁴⁹ had also been earlier participants. With the restructuring of the University of Rwanda, some members of staff were assigned different positions and those who had worked with me as a research participant, such as David, were promoted.⁵⁰ From their new offices notwithstanding, these officials helped me to meet other participants to share views on my study. I was also able to gather useful data from two parents; one working for a government entity, and the other as a farmer.

As previously mentioned, being an academic working at the University of Rwanda also enhanced the process of assimilation with students and staff within URCST. I was able to interact with female and male students, lecturers and parents. During this main fieldwork, I shared interview scripts with the lecturers and students who had participated in the first phase of the study. I asked them to validate their stories, and to provide additional information on issues where I felt I had not captured rich data. I also organised interview sessions with the incoming participants, to clear some contradictions on the issues raised by the respondents from the first phase of the study.

4.7 Sampling Procedures

While researching young women as they negotiated the gendered constructions to study science subjects at the University in Rwanda, it became clear that I could not contact all the students, lecturers and parents to gather my data. Arkava and Lane (1983) implore researchers engaged in such studies to deal with population samples that should be carefully selected to come up with suitable data. As such, I had to deal with specific individuals, whom I selected through a number of sampling techniques. There are three main sampling techniques used in this study; purposive, snowball and opportunistic sampling techniques.

⁴⁹ The names of the participants in this study are not real; they are all pseudonyms. I have used pseudonyms in this study to protect the identity of my participants. This confidentiality stems from the fact that the stories my participants shared were emotional, and the participants themselves did not feel comfortable being identified.

⁵⁰ My connection with this participant meant that I had great access to other potential participants. However, I doubt if gathering most of the information from participants to the exclusion of those who participated during the first phase of the study would have been possible without the existence of the latter. I could not have been trusted fully by participants had I not explained thoroughly the importance of my second visit to the College of Science and Technology.

Oliver (2006, p. 244), defines purposive sampling as a “form of non-probability sampling in which decisions concerning the individuals to be included in the sample taken by the researcher are based on a variety of criteria which may include specialist knowledge of the research issue, or capacity and willingness to participate in the research”. Oliver notes that this type of sampling is employed when the subject selected fits a specific purpose or description of the study. Similarly, Merrill and West (2009) define purposive sampling as a technique for studying individuals who have experienced the phenomenon that is being researched. Moreover, Denzin and Lincoln (2000, cited in Silverman, 2005) describe purposive sampling as a method employed by most qualitative researchers interested in seeking out groups and individuals living in settings where the processes being studied are most likely to occur.

It is clear from the above definitions that purposive sampling targets individuals or groups of people who have information that is directly related to the research phenomenon since such people have information that other members of society may not have. In light of these viewpoints, the first step in the process of gathering data for this study involved female students sharing their experiences of studying science subjects at the University of Rwanda. In addition to these young women, I was also interested in speaking with individuals who may have had influence over these young women’s experiences - such as lecturers, male students and parents. The students came from different academic years and disciplines of study (including those students from first year to fourth year)⁵¹ and were drawn from the Schools of Science, Engineering and that of Architecture and the Built Environmental. All the respondents were directly involved with science subjects either as students, parents of students, or lecturers. They were able to share their views and experiences with me, thus enabling the gathering of data for this study.

Besides the purposive sampling technique discussed above, I also used snowball sampling technique to select my study population. Noy defines snowball sampling as a technique of accessing ‘[...participants] through contact information that is provided by other [participants]. This process is [...] repetitive [...] [participants] refer the researcher to other [...]participants’ (2008, p. 330). In other words, snowball sampling involves the researcher

⁵¹ The undergraduate programme at the University of Rwanda comprises 5 levels: Level 1 corresponds to the first year of a full-time undergraduate course, Level 2 to the second year. Levels 3 and 4 correspond with the third year, while Level 5 corresponds to the fourth year, which is the final year.

choosing people to participate in his/her study through using previous respondents to reach out to those s/he does not know. The researcher relies on several participants to create a chain of respondents, thus collecting rich material that s/he would not have done.

As already discussed in section 4.6.2, I asked the young women and men whom I met through the guild students' body known as the University of Rwanda's College of Science and Technology Student's Association (formerly known as Kigali Institute of Science and Technology Students Association) [KISTAS]⁵² if they could help me inform their colleagues to participate in this study. Besides getting contacts through the guild students' body, I kept on asking individual participants if they knew fellow students who might be interested and willing to share their stories with me (Merrill and West, 2009). As an example, I met Belinda (as I refer to her in my interview script), a second - year female student studying food science and technology. I came in contact with Belinda through Nelly, one of the female participants I met during the first phase of this study. I asked Nelly to help me enquire if her colleagues would be interested in participating in this study. She then told me in her own words that "well I think there is a girl I know who has a unique story [...] She has got a child and yet is unmarried [...] it would be good if you interviewed her because she seems to have a unique story to tell".⁵³ To get participants (especially among lecturers), my contact person from the School of Science (department of food science and technology) introduced me to some lecturers I had not known prior to conducting this study. Having got their details, I approached them and set up appointments.

That the snowball sampling technique is associated with numerous advantages is manifested through its ability to enable the fieldworker to have access to participants s/he did not know before. This sampling technique allows the researcher to fill up the gaps by interacting with a big sample of participants thus collecting rich data. Despite these advantages, there is a tendency for old contacts to connect the researcher to either their relatives or friends. Noy also discusses the unreliability of this sampling technique by noting that "[...participants] whom the researcher meets are those who supply the referrals. Hence, the quality of the referring process is naturally related to the quality of the interaction. If the [...participant]

⁵²The student's guild body aims to protect and promote the interests of students. The association is led by the guild president and other elected members, vice president, secretary general, education minister, finance Minister, Information Minister, Minister of Health and Social Affairs, Minister of Sports, Minister of Leisure and Culture, Minister Public Relations and Protocol, Security and Discipline and Minister of Part-time Studies.

⁵³ Field notes taken on 10 December 2014.

leaves the interview meeting feeling discontented, or if the researcher did not win the [...participants] trust and sympathy, the chances the latter will supply the former referrals decreases” (2008, p.334). From these observations, if the researcher is not aware of such limitations, the use of the snowball sampling technique can jeopardise the research since someone may collect data from people who are not reliable.

In addition to purposive and snowball sampling techniques as discussed above, I used what Miles and Huberman (1994, cited in Merrill and West, 2009, p.107) regard as an ‘opportunistic’ sampling technique. As these scholars observe, opportunity sampling is about taking advantage of situations to interview individuals who have relevant information about the topic of investigation. In the process of selecting participants for this study, I was keen to identify people who could give me information about my topic. During the first and main phase of this study, I seized some opportunities to select parents I assumed had rich data for the present study. I made an appointment with the parents and came back to them for interviews.

In all, I interviewed 13 participants⁵⁴ (7 female and 2 male students, 2 male lecturers and 2 male parents) for the study. Although the sample seems to be small, I wanted to ensure that I include respondents with a range of experiences and understanding about the topic under investigation. Also, despite not aiming at presenting statistical representations about how many women have transitioned to the University of Rwanda to study science, my study was shaped by the imperative that I include some situations of female students classified by

⁵⁴ It is important to note that although the participants interviewed were 13 in number, I interviewed them more than once during the study. As mentioned earlier, fieldwork was carried out in two main phases. In the first phase of the study, I interviewed six participants (3 females, 1 male, 2 lecturers and 1 parent). Based on the findings during the first phase of the study, I identified some gaps and contradictions which needed to be investigated during the main phase of the study. The contradictions in the findings related to female respondents discarding the prevalent view about certain subjects being constructed as those that can be studied by men and others by women. Yet in certain instances, the females talked about male students as people who always encourage them to have confidence in developing their careers in science. Another contradiction I wanted to clarify related to a view put forward by a male respondent about subject choices. The respondent said science disciplines like estate management, biology and chemistry are mostly studied by women. This view gave me an opportunity to investigate why certain science careers are associated with women while others with men. To clear the contradictions, I had to interview these respondents again when I conducted the main phase of study.

*Ubudehe*⁵⁵ as the poor and the rich who would likely be a minority. There were also some female participants who had experienced studying in mixed and single schools and whose personal experiences I wanted to include because of the importance of understanding the factors that influence young women's choices to study science at the university in Rwanda.

4.8 Methods of Data Collection

4.8.1 Interviews

An interview is essentially a form of guided conversation where two or more people talk to one another about a subject both are interested in and thereby both create a form of knowledge (see Rubin and Rubin, 1995, 2012; Seidman, 2013). One motive of an interview is to understand aspects of the interviewee's life experiences from the latter's own perspective. To be successful, a good interview is influenced by the way the researcher and the researched make their lives and experiences meaningful during this interaction process (also see Holstein and Gubrium, 2003). More so, the researcher's age, sex, race and ethnicity always have a distinct effect on the interviewee's responses and the researcher needs to be aware of this (Denzin and Lincoln, 2011).

To gather young women's views and experiences on how they negotiate gendered constructions to study sciences at university, I used interviewing as a tool of research. I particularly used semi-structured interviews with open-ended questions during formal and informal settings. In her book chapter on the different types of interviews as used in feminist research, Hesse-Biber defines semi-structured interviews as those "conducted within a specific interview guide – a list of written questions that [one needs] to cover within a particular interview" (2013, p.186). To use semi-structured interviews involves having set questions although one does not necessarily have to follow the order in which the questions appear. This is not the case with unstructured interviews where one relies on themes that guide him or her to ask questions during fieldwork (Hesse-Biber, 2013). What I have referred to as formal settings are people's homes or offices, unlike informal settings where the researcher may meet participants along the road, in a taxi, during a music festival or any other

⁵⁵ *Ubudehe* is a kind of scheme which the Government of Rwanda uses to categorise people into different social classes (the poor, middle or upper class) with the aim of understanding their poverty levels. It is through these categorisations that the government is able to establish ways of mitigating poverty among the population. For a detailed discussion on *Ubudehe*, see Chapters 3 and 6.

‘none’ pre-arranged place to hold the interview. As an example, the lecturers – both females and males were interviewed in their offices. As people teaching in universities, it was quite easy to meet these participants in their offices since they normally gave me the opportunity to interview them after or before they could go for lectures. Likewise, I interviewed the parents who participated in this study from their homes because these were elderly people who could not access other places. However, although I met most of my female participants at the College of Science and Technology, I sometimes met them in restaurants, which are among the informal settings where data was gathered. This latter setting was intended to ease the power hierarchies that were prevalent between the researcher and her participants. By asking some of these participants to share with me their experiences and ideas over a cup of tea or coffee, I was aiming to meet them in a relaxed environment so that I could also share my own story.

To gather data for this study, I wrote down questions about the main themes under investigation. Although I did not strictly follow these questions in the order they appeared, they were a guiding tool during the interview sessions. In addition, the nature of the questions I asked my participants were open-ended. These were questions that did not elicit a simple ‘no’ or ‘yes’ but were those that allowed the researcher to ask follow up questions to acquire details about the topic of investigation.

In the course of interviewing my participants, I had different questions for specific groups of people.⁵⁶ The nature of the questions I asked female participants were not those I set out to ask the male ones. The questions I asked the female students concerned their educational background, subject preferences and attitudes about science subjects while in primary and secondary school. I also asked them about the challenges and opportunities encountered while studying science at the university. Moreover, I also sought to explore the parents’ and lecturers’ influence over students’ learning and choice of subject at the university. In such circumstances, the issue of gender in doing science was explicitly discussed. Any woman

⁵⁶ It is important to note that participants were coming from different multi-lingual backgrounds – French, Kiswahili, English and Kinyarwanda. Therefore, they could communicate in either of these languages. Thus, I gave them an option to narrate their stories in the language of preference. More so, given that I speak neither French nor Swahili, I requested that participants use English or Kinyarwanda or speak a mixture of them. Due to this, participants were able to express themselves freely and bring out their emotions of their educational journey to study science at the university. (For more details on the issue of language translation, see the section on data analysis in this chapter).

coming into science will be faced with the question of identity. To this end, in interviewing female participants, I sought to understand if there had been any incidents of sexism that prevailed at the university. I also wanted to understand what the girls interpret as sexism and if at all, they have experienced it in studying science subjects as they develop their careers in science. On the other hand, the male students and parents were mainly asked about their perception of women studying science courses at the university while the lecturers' views related to gender ratios in the various disciplines that they teach and the comparative achievement of females and males during their stay at the university. I also sought their opinions about girls pursuing careers in science at university in order to understand the social construction of women and how they struggle to negotiate studying science subjects at university.

On average, my interviews lasted between one and two hours. I tape-recorded the interviews I had with students and transcribed them verbatim. Although there are ethical concerns associated with tape recording (which I discuss later on pages 66-67), making recordings resulted in a more natural conversational flow during the interview session. However, it is important to note that not all interviews conducted were recorded completely. This was partly because some of the students did not want to record their discussions at a given moment. Moreover, the fact that lecturers allowed interviews during the time they had some free time, forced me to conduct the interviews in their offices where students and staff would come in and go from time to time, a situation which is not conducive for making recordings.

The participants in the study spoke of their feelings about young women studying science degrees. As the excerpts in Chapters Six and Seven demonstrate, the stories were so emotional and I did not expect to listen to some of the confidential, chaotic and controversial episodes of the stories from the participants. After the interviews had ended and the recorder had been switched off, I had a general chat with the participants and some of the female students asked me questions about my life and family. It was essential that I followed the principles of feminist research (Stanley and Wise, 1990, 1993; Abbott et al., 2005; Beckman, 2014). The technique of sharing one's experiences while conducting interviews is also applauded by Oakley (1981), in her study on women's transition to motherhood. Oakley postulates that in feminist research, the investigator needs to create conditions that enable the researcher and his/her participants to talk freely without hindrance. In other words, the interviewer and interviewee should have a two-way conversation where the former asks

questions and is also asked by the latter, a condition that collapses the power relations between the researcher and his/her participants.

Paying attention to these guidelines about the relationship between the researcher and researched, I shared my experiences in the research and of course, I have a lifetime to reflect on and experiences to draw on while I studied and worked for the DelPHE project that was run at the University of Rwanda - College of Education. With the advice I gave on their education, I made it clear to participants that I was using my own life and learning experiences as the basis for advice. While I have felt comfortable in sharing certain information about myself to make the relationship relaxed with the interviewees (Finch, 1993), I was careful not to lose myself in being too friendly and I have had to focus on the research agenda to lead the interview process (Ribbens, 1989; Edwards, 1990; Cotterill, 1992; Maynard and Purvis, 2013).

4.8.2 Documents

To complement the data from the interviews, I gathered important information from textbooks, abstracts, journal articles, seminar papers, dissertations and newspapers. I also drew on reports and statistics from Rwanda's Ministry of Education, Ministry of Gender and Family Planning, Ministry of Labour and Public Service, World Bank, United Nations Educational Scientific Cultural Organisation and the Department for International Development to understand debates surrounding my topic. These issues relate to educational policies, girls' education and participation in science degree programmes and the gaps that needed to be filled through this study. Other data was collected from the annual reports of the University of Rwanda's College of Science and Technology. With these documents, I was interested in data concerning the university policy on admission, learning and teaching processes, assessment strategies, the equality and diversity policy and the academic records of the students, information that later supplemented what I gathered from the field.

4.8.3 Use of a Diary (personal document)

Another kind of document I used was a diary. As Plummer puts it a "diary is the document of life par excellence, chronicling as it does the immediately contemporaneous flow of public and private events that are significant to the diarist" (1983, p.17). The use of the diary has importance in research as it helps the researcher not to "forget important aspects of the earliest thinking about the research which may be crucial for readers' understanding. Its use

also involves regular ongoing, self-conscious documentation of successive versions of coding schemes, of conceptual arguments of analysis, episodes both successful ones and dead ones” (Silverman, 2009, p.249).

In the adoption of this method, I have made notes about the research process, feeling statements about my learning journey, things I saw, heard during seminars, conferences and people I had conversations with to get a deeper insight into the emotions of the everyday lived stories of the women. Richards also notes that “opportunities drop from unexpected places which implies that the diarist needs to always be ready to capture any moment in his/her diary for future use” (2005, p.40). Through the use of a diary, the stories I have heard and seen have provoked further questions, which I later unpacked in the study (Snowden, 2015). Besides my personal reflections, I have also employed this method during the main phase of the study when some of the young women participants were not at ease with a one-to-one interview. I asked them to write a diary about some aspects of their lives and learning journey as shown in the excerpt below.

Figure 2: A Sample of the Diaries Written by my Participants During Fieldwork

15th October 2013

I am called Christine. I am 22 years of age. I was born in Kampala, Uganda. I study biology and I am in my final year of study. I have my mummy, she is a business woman and daddy died when I was very young. We are only two children, me and my little sister. She encourages me to study and doesn't want me to think about some little jobs before I complete school. I also have uncles and aunts and I look upon them for advice regarding my studies. I actually enrolled for my nursery studies at a school located in the suburbs of Kampala in Kololo. Then after my nursery studies we moved to Rwanda as a family. I then attended primary school at Ecole Primaire Saint Famille. I liked Science & Math subjects and also liked my teachers. My young sister had now joined nursery school. So mummy would pick us up from school at around 4:00pm when she was from work. I would reach home, put off my school uniform and if it's dirty I wash it. I also help around with housework. Although mummy didn't want me to be more involved in helping around the house, she wanted me and my sister to learn some small household chores. Mummy wanted us to learn the value of housework and that when we grow up into adulthood we are able to look after ourselves. She could insist on that point and we of course learnt household chores. Mummy could also remind us about homework and if at all we had been given any at school. I only went out to play with my sister when we had finished our homework. For my secondary school, I went to Groupe Scolaire Apred Ndera. Then later, I attended FAKLE Girls School for one year to complete my O level studies and I really liked the school and the teachers. I had a handful of subjects I studied during my O level but I preferred Biology and Chemistry. Later I joined Lycee de Kigali for my A level. I decided to opt for BCG (Biology, Chemistry and Geography) as a combination of study. In the A level national examinations I performed so well in Biology and got a scholarship to study here at KIST.

As this study shows, this data collection instrument⁵⁷ was able to enhance the stimulation of thoughts and feelings that the participant would not have thought about when in a one to one interview (Holliday, 2007; Richards and Morse, 2007; Day and Thatcher, 2009).

⁵⁷ Christine is not the real name of the person who wrote the diary. She has been given a pseudonym to maintain the confidentiality of the research.

4.9 Ethical Considerations

The nature of the research conducted for this study required that I am aware of numerous ethical issues since it involved bringing forward people's lived experiences. In the first instance, I had to seek permission in order to conduct this study. From seeking for ethical approval from CCCU, a research permit from the Ministry of Education in Rwanda, requesting affiliation at the University of Rwanda's College of Science and Technology to asking for participants' consent, I endeavoured to respect the position of my participants.

First, just as I explained to the relevant authorities what I was investigating before gaining access to the University of Rwanda, College of Science and Technology, I also ensured that I explained to the lecturers, students and parents I met for the interviews what I was studying and why I was undertaking the study. I explained to all the participants that their participation was voluntary and those who felt uncomfortable about participating in the research could withdraw at any time (Miller and Bell, 2002). Before making any recording, I explained its purpose to the person interviewed (that this is intended to save time during the interview and also enhance play back during the phase of analysing data) and for those respondents who did not feel comfortable with being recorded, I respected their decisions.

As explained, since confidentiality was an important element adhered to in the research, I told the participants that their real names will not be used while writing the final report of this study. And in such cases, if the information is crucial for my thesis, I would use pseudonyms to conceal the identity of the participant in question. However, during the main phase of the study, Nelly, one of the participants seemed to be uncomfortable with the use of the voice recorder in the research. I do recall her saying that the lady or the team in charge of the British Broadcasting Corporation (BBC) documentary came to Rwanda interviewing several people and used the voice recorder. But later what they broadcast or disseminated did not reflect most of the people's voice.⁵⁸ Nelly's worries stemmed from the story reported in the Rwanda New Times paper entitled 'Unearthing falsehoods in the BBC documentary on 1994 genocide' by Shema (2015). In the story, the BBC journalist disguised the true intentions of the recordings of the project he was undertaking. As it turned out, these interviews were part of the documentary the BBC was making to examine the efforts of the 1994 genocide in

⁵⁸Fieldwork notes taken on 19 December 2014.

Rwanda. People who had participated were shocked to hear their voices, which were purported to tell the other story of this story.⁵⁹ Given Rwanda's political history, one needs to be very cautious when conducting research. Rwanda's political background, especially the events that surround the 1994 genocide, has had a serious effect on people's lives. A great percentage of Rwanda's population experienced suffering and pain as a result of the genocide. In Chapter Six, I present the story of Nelly and also show how the recordings by the researcher worried her. As Nelly explained, her worry related to the fact that I might take her recordings and use them for other purposes other than the study I had discussed. In the case of the BBC journalist quoted above, his behaviour has made some Rwandans become suspicious of the people who go to their communities for fieldwork. As researchers, we have an ethical duty to respect the respondents we work with and be accurate and honest so as not to jeopardise their security and make them lose confidence in future scholars (Finch, 1993; Edwards and Mauthner, 2002). As the case of the BBC journalist illustrates, it becomes a big risk to ask individuals to speak about their experiences since this may cause emotional distress or trauma, especially in circumstances when past experiences have been used to promote the interests of others. The very nature of these questions regarding anonymity and confidentiality of the interviewee's voices served to reveal the socio-political realities of the everyday lived experiences. Therefore, it is considered a risk to asking individuals to speak about their experiences since this may inflict emotional distress or trauma. Instead, the way we do research should be reflexive of such issues so as to avoid being on collision with our participants.

4.10 Insider/Outsider Research: Negotiating Different Selves and other Challenges during Fieldwork

Conducting this study presented numerous identity issues to the researcher which, as Feldman et al. (2003) have argued, need to be negotiated in order to connect to one's respondents and collect the necessary data. These ranged from being a scholar pursuing a PhD from the United Kingdom and a person of 'higher' status because of being to the UK, an

⁵⁹ On 1st October 2014, the BBC broadcast a documentary on the 1994 genocide in Rwanda, titled "Rwanda's Untold Story", that a group of scholars, researchers, and historians have expressed their grave concern at the broadcast of its contents. The critics point to serious inaccuracies in the programme and explained how part of its content promoted genocide denial.

assistant lecturer at the University of Rwanda's College of Education, a local resident because of being able to speak Kinyarwanda⁶⁰ to being an unmarried woman. I also carried an identity of being a scholar from the arts and humanities background, not a scientist. Firstly, despite working at University of Rwanda's College of Education as a research assistant and later as an assistant lecturer, my return to this university as a PhD student presented me with a different identity. I was seen as an outsider when I returned to this university for fieldwork. I had spent over a year in the UK as part of my doctoral studies. When negotiating for access at this institution, I was considered an outsider because I was not well known to the participants as either a colleague or their teacher. It had been long since I was at this university; the last time to be at the University of Rwanda was in 2008 when I conducted my MRes study, at the College of Science and Technology. Although some members of staff were still there when I returned for the PhD research, most of the students who had participated in my earlier study had long completed their studies and had left the university.

As such, when I went back for the present study, I was considered an outsider by the students. Chatman, Eccles, and Malanchuk observe that "new experiences and situations need to be integrated with existing aspects of the self" (2005, p.116). What this scholarly viewpoint partly implies is that fieldworkers engaged in studies such as the present one need to adapt to different contexts and negotiate their identities in such ways that suit the conditions of the time. To allay fears about being an outsider who had invaded "their" institution, I had to explain to the students, lecturers and university administrators that I was conducting a study as part of a PhD. As time went on, these participants became acquainted with me, thus regaining my insider position. As Ramazanoglu and Holland (2002) have also argued, explaining to these participants that I was a scholar pursuing a PhD helped because it calmed the suspicion about the activities, I was to engage in.

Further, as a PhD student, participants seemed to place me in a superior structural position. They looked at me as someone doing studies in the UK and also assumed that my period of

⁶⁰ The 1994 genocide, which resulted from the ethnic tensions between the Hutu and Tutsi, has motivated the Government of Rwanda and other stakeholders to discourage issues of ethnic identity in the country. It is almost outlawed to talk or ask questions about one's ethnicity as this might be seen as an attempt to bring back the nasty memories about the genocide. Such questions are also considered divisive. As such, despite having an ethnic background, I am hesitant to mention it as one of the identities I could have carried to the field. For more discussions on identity and the 1994 genocide, see Byamukama (2008) and Uvuza (2014).

absence from Rwanda had detached me from the ‘real’ realities of women’s education. This kind of construction meant that I would misrepresent the facts about what was actually happening on the ground just like other “outsiders” had already done.⁶¹ In relation to status, participants assumed that I was too ‘expensive’ to sit down and chat with them. They also thought that I only speak English, the language of ‘high’ class people and could not speak Kinyarwanda, the local language. These issues have also been raised by Merriam et al. (2000) in their work on how to negotiate outsider/insider identities while conducting fieldwork. Sharing experiences about their low status respondents, Merriam et al. (2001) note that people from whom information is sought sometimes feel inferior and refuse to cooperate during fieldwork. What scholars need to do is to explain themselves well in order to calm such respondents. While conducting fieldwork, I also had to allay the fears of my participants that I was not one of them; my position should not be a problem to them. They did not need to view anything I did from the lenses of the UK. I had to constantly interact with my participants during coffee and lunch breaks. As a result, I could tell them more about myself to enhance an understanding of my personality such that I do not appear to be a ‘posh’ woman from the UK who had come to take away ‘their’ information.

In spite of being an outsider, I did not completely lose my insider identity. Firstly, before embarking on this project, I had been a student at this university. Not only did I study my Bachelor of Arts (with Education) degree from Kigali Institute of Education (which was later turned into the University of Rwanda’s College of Education), I also studied an MRes at this university. Besides, as pointed out previously, I was a research assistant at the College of Education working on the DelpHE project – Girls into Science and Technology, a British Council sponsored project. Above all, I was an assistant lecturer, based at the Department of Educational Foundations and Management where I taught modules on Life Skills Education and Sociology of Education. All these roles and activities brought me closer to numerous lecturers who first viewed me as a student and later as a colleague. When I explained to students who did not know me before this study as someone who had studied and taught at this university before becoming a student again, they accepted me as part of the university community. I was an insider. Although these identities privileged me to easily reconnect with

⁶¹ Nineteenth century scholars, missionaries and explorers from Europe and other Western countries collected substantial ethnographic material from Africa. Because they did not belong to these societies where such materials were collected, their analysis presented African people as backward and uncultured. Such stereotypes were the justification for European powers to dominate and colonise Africa.

these participants, they presented me as someone who was researching on issues I had already experienced. To take as an example, some of these participants looked at me as a person who already knew about the university policies on admission, learning and teaching, higher education financing and the student loans scheme, among others. These were issues, which I kept reminding my participants, especially lecturers and university administrators, that much as I had experienced these issues, I had not understood them. As such, investigating them through this research would enable me understand them better.

I also anticipated the difficulty of understanding the researched because I am not a scientist myself. What do scientists experience – particularly women – which they may not be ready to reveal? How do you report research findings about science professionals? How are scientists taught and learn? These were some of the issues I was grappling with as a non-scientist. I went into the field knowing that certain information may not be accessible since I could not get involved in some of the activities of the participants. Through constant interaction with the participants, I came to understand some of the issues that surround science teaching and learning as reported in this PhD thesis.

Besides the above, I also carried the identity of a woman in the field. Not only was I an educated woman from abroad, that is, the UK, I was also looked at as a woman who had ‘failed’ to get married. As Jefremovas (1991) as well as Uwineza and Pearson (2009) assert, in the Rwandan society, like other African societies, getting married and bearing children are significant aspects in giving women respect and recognition. If one goes beyond a particular age and attains a certain educational level but is not married and has no children, society will ask numerous questions. In my case, people were wondering as to why a woman investigates issues of fellow women studying sciences. How does she study up to the level of PhD without getting married and producing children? Is she not as shy as most women or as bold as those other feminists from abroad ‘whose objective is to shout and make noise’?⁶² These were some of the issues many people used to evaluate my identity as a woman from the perspective of my society. In most cases, some of these questions were raised directly by my

⁶² Most African men (even women) look at feminists (commonly regarded as women activists in Rwanda) as people interested in shouting and making noise about obvious things. As an example, how can one claim that a man is not the head of the family or that men should help women to perform their daily routines at home? To understand these issues, one needs to read the reactions of the people responding to Stella Nyanzi, a Ugandan scholar on gender issues when she used sex metaphors on her Facebook page during her campaign for sanitary pads for school going children in Uganda.

interviewees who looked at my academic ambitions as an impediment to my womanhood. One case in point was when I entered the office of one of the female directors at the university. My aim was to get statistical information in relation to the issues I was investigating. When I entered this office, I expected to be treated respectfully and gain acceptability, which was not the case. Before I could explain why I had gone there, this official asked me, ‘Are you married? Do you have children? Eh, when will you ever complete school?’ As I pondered these questions, the lady chipped in and said “do not worry, you have got plenty of time [to get married and have children]”. But considering that I was already in my early 30s, a period when ‘most women’ should have got married, I thought her response was merely a mockery. So, I left her speculating and thinking that I am over ‘ambitious’, ‘selfish’, and ‘self-centred’. It is for these reasons that when I interacted with some of the participants, I decided to say I was Mrs; but to others I would say Ms. I felt this ‘was not right’ but it was indicative of my own lack of self-confidence. This, presumably seen as a small matter, highlighted a lot of issues about my relationship with the students and lecturers. It seemed to me then, as it does now, that I was unlikely ever to be able to look at situations without seeing gender in operation. If I had been a male investigator, I would not have faced such a dilemma. Wanting to understand how the young women grapple with affirming their identities while negotiating societal notions of gender and familial roles in pursuing their ambitions in education, came out as equally important as trying to understand myself. In fact, the male and female students rarely called me Mrs. Dorothy; they usually called me by the title of Miss. In retrospect I should have asked to be called by full names as one of the feminist scholars did (Griffin, 1985 in her work titled; *Typical girls: Young women from school to the job market*) and not by a title at all as it set a distance between me and most especially the students which later I had to break through and align with them.

There were also other challenges that I encountered during the course of conducting this study. The fact that I had gone to England for my PhD made some of my family members and friends to believe that I could even conduct the research in the UK. No one could understand why a young woman could leave England to conduct a study more than a thousand miles away. Many colleagues and even students did not take me seriously – some thinking that perhaps I had come home to conduct research on behalf of an international organisation. By presenting my documents from the university and other departments especially from the Government of Rwanda, I was able to convince my friends that what I

was doing was my own study, something geared towards the attainment of a PhD. Related to the above, is the challenge of class dynamics that the pursuance of a PhD brought about. Am I not above my friends in terms of status because I have started on a doctoral programme? How can I relate with colleagues who regard themselves as less ambitious than me – someone they describe as an ambitious person? These were some of the issues that came up whenever I interacted with my colleagues. To curb this challenge, I had to feel as ‘normal’ as possible about my ambitions as a scholar. I pretended that doing a PhD was not that important; I gave the impression that I did not care about being called a Doctor.⁶³ I was always careful, therefore, to make light of my university achievements and refrained from mentioning, for example, conferences I had attended within the UK and other European countries.

4.11 Data Analysis

Like with most studies in the humanities and the social sciences, the process of analysing data for this study began with what could be called ‘document and related literature reviews’. This included the review of numerous documents from the Rwandan Ministry of Education, the Ministry of Gender and Family Promotion, the Ministry of Local Government, the Ministry of Labour and Public Service and the Ministry of Finance and Economic Planning as well as those from the World Bank, DFID, UNESCO and UNDP. As this thesis highlights, documents from the Rwandan Higher Education Council, the Rwanda Education Board and the University of Rwanda were also analysed, specifically those related to admission policies, learning and teaching. This phase of the analysis also involved a review of the academic literature – which included books, dissertations, textbooks, newspapers and articles from scholarly journals aimed at understanding debates surrounding the topic in question and analysing the gaps that need to be filled through this study.

When the current author went to Rwanda for the first phase of the study between the months of August and November 2013, another phase of the data analysis began with the collection of the field data. While in the field, sometime was set aside during the evenings to listen

⁶³ The title of Dr is one of the motivations for most people to pursue doctoral studies in Africa. In fact, this title is tantamount to first names of those holding PhDs. Moreover, after attaining a PhD (especially in Africa), there are many chances of obtaining a high position in Government. This second factor made most of my friends to always hold me in high esteem. They were like when you are done with your studies, the government is going to appoint you to a key position. And I was like, it is not what I am interested in, I just like to pursue my career as a scholar.

through the interviews recorded during the time of interaction with the study's participants. In situations where it was discovered that not enough information had been collected on a particular theme, further interviews were organised to fill the gaps, while the recorded notes (and some of the participant's diaries) were transferred into a 'readable format', rewriting them in such a way that would ensure they could be easily read when the field study was completed.⁶⁴ This was influenced by the views advanced by Mauthner and Doucet (1998) regarding the messy and confusing nature of the early stages of data analysis that scholars need to be aware of. This includes having some of the material in shorthand or compiling others in pencil, a process that could easily result in the deletion of some data or ending up with uncoordinated notes and recordings. Writing the field notes and the diaries of the respondents was carried out with the aim of avoiding such situations.

After conducting both the first and second phases of the study, I returned to CCCU with the interviews that were conducted with the female and male students, the male lecturers and the parents. All of the interviews were transcribed and those conducted in Kinyarwanda were later translated into English. In the narration of some of the participants' stories in Kinyarwanda, there was some usage of various French and Swahili words. Here, it is important to note that French and Swahili have had a significant influence on how the Rwandese speak both English and Kinyarwanda. This influence is manifested in the way certain words are pronounced and there were situations where some French and Swahili words were intonated in Kinyarwanda. In other words, French and Swahili words tended to be used when the individual failed to find the exact Kinyarwanda word to express what she or he wanted to communicate. As such, while most of the interview transcriptions were translated into English, there were a number of cases where the services of a colleague who was an expert in linguistics was sought to help with translating the texts, which had various French, Swahili and Kinyarwanda intonations, that I did not understand. Moreover, there were a number of Kinyarwanda words which I did not understand and my colleague again helped to translate them into English. After translating all the text, I entered the phase of data coding.⁶⁵ Coding refers to the process of "indexing or mapping data, to provide an overview

⁶⁴ Most of my field notes were made in a rough manner, which not everyone could easily understand. This is due to the fact that I did things hurriedly since I was always on the move to catch up with my participants.

⁶⁵ Microsoft Office Word was used for coding data. Here I was able to organise and keep track of all the information of my participants. Despite other softwares being used in analysing qualitative data, such as NVivo and ATLAS, effort and time were needed to become conversant with them. (see Cohen et al., 2011)

of disparate data [...] in relation to [one's] research questions" (Elliott, 2018, p. 2851). This is generally done to refine the understanding of the stories in a more systematic way (Richards, 2005; Merriam, 2009; Smith and Davies, 2010). In view of coding the data, iterative listening of the voice recordings and readings of the transcripts helped me to become familiarised with the data as a way of ensuring that none of the important points were missed and that the previously unnoticed features of the transcribed data were reported and cross-checked with the field notes taken during data collection. Having become familiarised with the data, one interview was randomly selected before it was re-read in order to identify the key ideas and to create preliminary codes. This was repeatedly done with all the participants' interviews, which included female and male students, male lecturers and parents. A list of key words was developed, from which the final codes were generated before the same process was repeated until all the interview transcriptions which had been typed, were coded. The coded data was later categorised into different themes to ease the understanding of the work in relation to the research questions and the existing literature (Smith and Davis, 2010). The themes that emerged from the field data included family income, parents' educational influences, women as independent objects, teacher influences, male students' attitudes towards their female counterparts and the role of government policies. These themes were later discussed in relation to the earlier themes identified from the books and articles reviewed.

The approach to interpreting the data was influenced both by feminist perspectives and my own experiences which would allow my identity to be located within this study (Mauthner and Doucet, 2003; Creswell, 2009). It also depended on the themes that emerged from the literature reviewed. As noted by both Stanley and Wise (1993) and Mauthner and Doucet (1998), conducting feminist research can lead to many questions about the nature of being human, or of how we make sense of another's experience of life. In representing the stories of the participants, the aim is to give a voice to the participants, especially the women, whose "sociological visibility is low [...] and whose] experiences have been distorted by [other researchers]" (Stanley and Wise, 1983, p.13). As the various themes were identified, I also made sure to mark the excerpts that could be directly quoted in my thesis as a way of projecting the voices of my participants.⁶⁶

⁶⁶ See, Mauthner and Doucet (1998); Burns and Walker (2005).

4.12 Conclusion

This chapter discussed the methodological underpinnings surrounding the study. By drawing on several methodological ideas from various scholars, I have discussed the processes undertaken in conducting the study, justifying the use of certain research approaches and methods and why they were deemed suitable for a study such as the one I have undertaken here. My own role in this project was also discussed along with how the different ‘selves’ were negotiated, that is, as researcher, as non-scientist, as outsider from the UK and as non-teacher at the University of Rwanda’s College of Science and Technology.

In conducting this study, it became paramount to consider the nature of the methodology to be used, the design that would enhance the implementation of the research, the tools for data collection, the ethical issues that the study may bring up and the theoretical approach that the study hinges on. Both the qualitative methodology adopted, the case study approach and the tools used in data collection were deemed as appropriate as they facilitated a deeper understanding of the lived experiences of the women studying science at universities in Rwanda. In addition, these methodological approaches were deemed as appropriate for feminist studies such as that presented in this thesis since the participants were given a platform for narrating their experiences, ensuring that they could speak for themselves and that their voices could be heard. More specifically, the feminist approach adopted not only helped in bringing forward the voices of the participants, but also became a site for me, as a researcher, to share my story in order to enrich the data collected for this study.

Chapter Five

Biography of the Research Participants

5.1 Introduction

This section provides the biographical information of the participants with whom I interacted during the interviews. Among other details, I provide a brief overview of the family background and educational journey of these participants in order to demonstrate their negotiation of several social-cultural and educational dynamics when gaining admission to university to study science. Specifically, I note the subjects studied, entrance to university and societal attitudes towards young women studying science disciplines. It is worth noting that I offered to maintain the participants' confidentiality by using pseudonyms to conceal their identity. In the next sub-section, I begin with Brenda's biographical information.

5.2 Brenda

When I met her during fieldwork, Brenda was a third-year student of estate management and evaluation at the University of Rwanda's College of Science and Technology. Brenda told me that she was born in 1990. She was raised in Tanzania; her parents having relocated there during the civil war of the 1950s. At the time I interviewed her, Brenda had a sister who had completed a medical degree at university but did not have any male siblings. After the overthrow of the second Republican government during the 1994 civil war, her parents returned to Rwanda. Although she attended her early years of primary school in Tanzania, she went to secondary school in Rwanda and majored in science subjects until university. When I met Brenda, she revealed that both her parents were scientists; the father was a veterinary doctor while the mother was a nurse.

Brenda spoke of her love for mathematics, tracing it to early primary school. She later continued her 'O' and 'A' level studies at FAWE Girls' School from 2004 to 2009, a prestigious all-female boarding school located in Gisozi (Kigali). She studied both arts and science subjects at 'O' level. At 'A' level, she specialised in science subjects, namely, physics, chemistry and mathematics (PCM).

She seemed very ambitious and, at the time of our interview, she represented students as the Gender Minister - a post that is always competed for in the student guild leadership elections.⁶⁷ Brenda draws inspiration and support from her parents and sister, who helped her to prepare well for school. Besides paying school fees, Brenda told me that her parents bought books to supplement those she found at school. In addition, her parents did everything possible to ensure that she studied and performed well at school. On applying to university, Brenda was awarded a full scholarship. She said she attends university in order to fulfil her dreams of becoming a scientist. She has been given the impression that people consider it brave of her to study science subjects, as they are thought to be studied more by men.

5.3 Nelly

Another research participant is Nelly, whose background information is presented below.

Nelly was a second-year female student studying construction management during the time I conducted this study. She was born in Kigali, Rwanda in 1993. Both her father and mother were soldiers and neither of them attained a university education. Nelly was the second born in a family of three children, two girls and one boy, in a family she describes as 'low middle class'. She attended primary school at IFAK in Kimihurura, (Kigali) and continued to secondary school at St. Aloys Groupe Scolaire in the Rwamagana District. While at secondary school, she studied both humanities and science and, once she had completed her 'O' levels, she moved to APAER in Kabuga, (Kigali) for her 'A' level studies, where she specialised in mathematics, computer science and economics (MCE). Nelly opted for these subjects because she has had a passion for technology ever since she was a little girl and hopes for an opportunity to achieve her goals one day. Given the nature of her parents' jobs, her father was always posted to work upcountry but her mother was always based in Kigali. Alongside her profession as a soldier, her mother also had the opportunity to be close to the children. Nelly also told me about her father, who loved her and her siblings equally and urged her to take her studies very seriously. At high school, the main language used was French. On attending university, she was determined to learn and speak English fluently,

⁶⁷Brenda had been elected the students' Gender Minister in 2013 for the University of Rwanda's College of Science and Technology. It is a position that is held for a year and is competed for among students in the students' association of the university, formerly known as KISTAS. The association is led by a guild president and another 14 elected members. Brenda's election to the above-mentioned position is testimony to her hard work and determination to defend students' interests, especially relating to issues of female student welfare such as accommodation and sanitation (she told me during our interview that she tries to be a voice for the voiceless).

given that it is the main medium of communication and instruction there. She educated herself through reading, gaining an excellent grasp of the English language. Moreover, her friendships with older intellectuals had increased her confidence as a student of science. When I interacted with Nelly, I saw a young woman who was proud of her scholarship to study her choice of subject at university. Her only challenge is to live in a society that does not believe or credit women for achieving the level of education that allows access to university, especially to study sciences, which is the way Nelly's case was portrayed. Nelly told me that, when she occasionally visits her relatives in her village, they complain that she has spent a long time at school. She seemed to be bitter about masculine dominance and does not fantasise of marriage like most girls. Despite these challenges, some male students and teachers have been supportive of her studies. Nelly displays a keen interest in her studies and in achieving a career that will make her financially independent.

5.4 Janet

Janet's case is presented below.

Janet was born in 1993 and was the third child, but the first daughter of a family of six children, who spent most of her childhood years in Sembabule District, the central region of Uganda. Janet's family was forced to relocate to Rwanda during the 1950s when Rwanda began facing political upheaval. Janet was raised mainly by her mother, who was a farmer, while her father was in the cattle business. Her other extended family returned to Rwanda in phases, but her mother and father chose to remain in Uganda. Neither her mother nor father attended school. At ten years of age, Janet lost her father. After his death, she experienced difficulties at school but, with the help of her mother, she was able to complete elementary studies at Matete Primary School in Uganda. While at primary school, she enjoyed studying science subjects, despite her friends preferring social studies and English. Janet scored well in her end of year exams at primary school and then joined Masaka Senior Secondary School in Uganda. She said that she had to make a determined effort to succeed because her parents did not encourage her to revise when she returned home from school. Janet would help wash the dishes at home and help her mother put the younger siblings to bed. When she attended secondary school at Masaka Senior Secondary School, she studied both art and science subjects. She performed well in class and was well liked by her teachers. In spite of this, she later faced the wrath of her mother's best friend, who was jealously critical of her achievements at school. Janet achieved good marks for her senior four national examinations.

However, Janet stated that, while growing up, her family did not have enough money and it was at this point that she was unsure of whether to progress to studying 'A' levels. However, her uncle supported her to continue with school.

Janet acknowledged that it was her uncle, rather than her mother, who accepted responsibility for her education. He brought her to Rwanda in 2010 to continue her studies there. Thus, Janet moved to Rwanda after her 'O' levels and enrolled at Lycee de Kigali, retaking her 'O' level national examinations. She remembers being fascinated by chemistry and biology, although she had difficulties in mathematics. She achieved her 'O' level exams with good grades and joined FAWE Girls' School to complete her 'A' levels in physics, chemistry and biology (PCB). Janet believes that, if she had stayed in Sembabule, she would not have continued her studies to university level. She attributes this to the low level of education among her peers and the illiteracy rates of the population in her village. In 2013, she enrolled for a degree course in water and environmental engineering at the University of Rwanda, College of Science and Technology. She said there were more girls attending university at that time and reiterated that she was eager to get a job outside the home, like men, so that she could better her life and that of her family. When I asked Janet about issues like marriage, she replied with a smile "*Kwiga biruta kurogorwa*", literally meaning that education is more important than marriage. Janet said that friends and neighbours like to ask such questions. Her friends studying economics, law and modern languages wished she would change her subject of study because they think it is too difficult for a woman to study science subjects. They feel she will not complete her studies if she continues to study sciences, but Janet is determined to study hard and accomplish her dreams of becoming an engineer.

5.5 Claudine

Below I present the story of Claudine.

Claudine comes from a rural background having been born in Nyamagabe District, the Southern Province of Rwanda on August 6, 1988. She was the eldest child in a family of five children, two girls and three boys. Her father was a farmer and her mother, a housewife. Neither of her parents had formal educational qualifications. Claudine was born into considerable poverty as her family often struggled to make ends meet. To Claudine, her home was not the kind of household, that she used to hear some of her classmates talk about while at school. It was not the type of household where parents pay their children's school fees on

time, pack breakfast and lunch for the children, or afford to have a balanced diet at home. Hers was a home where there was no tea in the morning, and if they were lucky, they would get dinner in the evening. Besides that, there was not enough money for fees, and together with her siblings, Claudine hardly attended school. The situation became worse when her father remarried and abandoned Claudine's mother. At this moment, Claudine was seven years old. Claudine's childhood memories of her mother seemed permanently imprinted on her mind. She did not have the best childhood, and her traumatic upbringing left her needing therapy.⁶⁸ Her grandmother always took care of her and her siblings while her mother was always sickly. She knew from a very early age that she never wanted to live like that - that the most important thing to her was education. Despite her struggles at home, Claudine liked school so much that she stayed in school unlike some of her siblings who dropped out. She even performed very well at school.

While her father and mother failed to support her, Claudine had other people to look to, especially the teachers who lived in the neighbourhood. These were some of the people who encouraged her to continue with her secondary school studies at Mushubi in Nyamagabe District and later at university. When Claudine faced financial hardships in primary school, she went to the executive officer of her district and was able to get help with school fees. She reencountered financial difficulties while in senior three and senior four. At that time, her friends advised her to talk to someone at the district level. She again reached out to the executive officer and received help with her school fees so she could continue studying. Claudine got a full scholarship to join the University of Rwanda's College of Science and Technology to study biology. By the time I conducted this study, Claudine was in her second year at university. Despite being a student, Claudine was married and had given birth to a child in her first year of university. She was twenty - one years old when she became pregnant. Becoming a mother was an opportunity for her as it gave her a sense of identity. Although the situation of studying as a mother brings with it the challenges of providing for the children, this seemed to be advantageous for Claudine as she found happiness and a place to live in and finally call home. Her grades at the university were good, and she was looking forward to becoming a laboratory assistant upon completion of her studies.

⁶⁸ In western societies such as the United Kingdom, children who face such traumatic challenges like Claudine are most likely to be taken for counselling to avoid stress. It is obvious that the prospect of one's mother and father splitting up presents numerous problems including lack of proper care. If helped, such children as Claudine can end up feeling loved, confident and strong and can fit in the company of others without isolation.

5.6 Belinda

Belinda's biography is presented next.

Belinda was born in 1989 in Luwero District, in the central region of Uganda. She was the second born child in a family of two sisters, with one older sister and one younger brother. Belinda's father was a cattle herdsman and her mother, a housewife. Her father was educated up to primary six while her mother did not attend school at all. Belinda noted an absence of parental guidance in her studies. Her father died before she joined secondary school, leaving her mother to provide for the family. Belinda attended Maranatha primary school for her elementary education in Uganda. When Belinda went to Rwanda, she studied at Bihinga secondary school for her 'O' levels. She also attended Groupe Scolaire Gahini for her 'A' levels and later went to the University of Rwanda, College of Science and Technology to study a degree course in food science and technology. But all has not been rosy for Belinda.

At fourteen years of age, when she had just joined senior one, she became pregnant. Her family were hesitant to send her back to school after this incident. Some of her relatives wanted her to get married to the father of the child. By Belinda's account, she was miserable throughout her pregnancy, and pressure from her mother, relatives and neighbours influenced her decision to move from Uganda to Rwanda. With remarkable energy, Belinda then set out on a journey from Uganda and was able to reach a place called Kabarole in Rwanda, and eventually reunited with an aunt who was willing to take care of her until she gave birth. After the birth of her child, Belinda was encouraged by the aunt to return to school. She enjoyed studying science subjects more than humanities. Belinda said that she was not sure of what career to pursue in future although she admired pilots. She changed her desire to become an airline pilot because she was not good at mathematics. One thing as she got along with her studies, was her love for science subjects, especially biology and chemistry and so she studied physics, biology and chemistry (PCB) at Groupe Scolaire Gahini. Given that her guardian (the aunt) did not have enough money to cater for all her school basics, her school fees came to be paid for by FAWE, an NGO catering for girls from marginalised communities in Rwanda. Her sponsors at FAWE were impressed by her performance and responded by paying her school fees. As well, Belinda came to know a circle of intelligent women from FAWE who became her lifelong friends, sympathising with and supporting her 'A' level education. She admitted to passing well her 'A' levels well. On fulfilling her dream

to join the university, she said that she had to work hard, and that her mind was not weak, and that besides, her perseverance was equal to that of a man.

5.7 Judith

Below is Judith's story.

Judith was born in 1989. Her father was a medical doctor but died during the genocide when Judith was just five years old. Her mother worked with the Ministry of Agriculture as an agronomist but died two years later after the genocide. Judith was seven years old when her mother passed on. She was the firstborn among her two siblings. She managed to survive the genocide with one little brother while the other little brother disappeared during the genocide. Judith told me that she did not know what happened to her brother, or whether he was still alive or dead. As a little girl, she had been both ambitious and clever and was encouraged by her father to follow in his footsteps to study science and become a doctor like him. With the death of her parents, her uncles and aunts took on the responsibility of bringing her up with her brother, and this caused her to move homes several times to live with different relatives. She first moved to Bukavu (Congo) and attended elementary education from there. Judith said that later she moved to Rwanda to live with an aunt. Her aunt was willing to take care of her and pay for her school expenses.

Judith was enrolled in secondary school at Ecole Secondaire Congolaise – a French - speaking school in Kigali. She said the school was not very competitive, but she had to put in lots of effort to pass her 'O' level exams. She later got enrolled at College Saint Andre for her 'A' levels. Janet studied mathematics, biology and chemistry (MCB) as her subject combination at 'A' level. Although Janet got along well with her studies, at home she was unhappy as her aunt was interfering with her school schedule and wanted her to do more housework than revising her books. Judith said that her aunt was a complicated and difficult woman to live with. When her 'A' level results were released, Judith had not passed well. Judith said that she could not at that moment envisage any tolerable future for herself without her parents. In a remarkably courageous act, Judith left her aunt's home, setting out on a long and uncomfortable journey, with little money and the addresses of a few family friends. She settled in one of the suburbs of Kigali and would remain there to repeat her senior six exams a year later.

When Judith repeated her senior six, she chose to study physics, chemistry and biology (PCB). Given that she had passed biology and chemistry in her previous 'A' level exams, she now had to re-do physics. This is something she said was allowed by the Rwanda Education Board. When Judith re-sat her exams, she passed well and got a scholarship to study biology at the University of Rwanda, College of Science and Technology. Given that Judith had left her family relatives, she was on her own and felt excluded and bitter. To continue with her university education, she decided to become a dutiful feminine woman whose life became an echo of other women. Judith got married. That, according to Judith, was the culmination of success that led her finally to study a degree in science at the university. She was fortunate in her marriage; her husband was much older than her and supported her endeavours. Judith talked movingly about women's common fears, particularly about giving attention to the husband and caring for the children. She said that she was torn between her feminine roles and her own ambitions, but she took her studies seriously. She was motivated by girls who were getting first-class degrees in science, and she thought to herself that she could also make it.

5.8 Christine

The story of Christine is also presented below.

Christine was born in 1992. Together with her sister, she was raised in a happy home with plenty of love. Her mother and father were devoted Christians, something that impacted on Christine's later life. Besides, Christine came from a middle-income class family, given that when she was born, the family lived in a modestly wealthy suburb of Kololo in Uganda. Christine told me that her father was a lawyer and was educated to university level. Her happiness, however was short-lived. She was in primary one when her father passed on. Her mother had to soldier on and provide for the family alone. Christine said that her mother was a businesswoman and had pursued an accounting course at diploma level. Christine attended Ecole Primaire Saint Famillie for her primary studies before joining Groupe Scolaire Apred Ndera for her 'O' levels and FAWE Girls' School for her 'A' levels. As Christine put it, her mother served as role model and source of support. She encouraged her to accomplish her studies, explaining that she would be the one responsible to take care of her little sister and her mother in old age. Christine also said her mother was keen to teach her household chores with her little sister, and advised her to stay away from situations that would cause her to get

married at an early age. Christine had liked science and maths subjects since her primary school days. She claimed that the schools she had attended had a conducive learning environment, and that she liked her teachers so much. Christine believed the difficulties she passed through, especially after losing her father at an early age motivated her to work hard and acquire a scholarship to study biology at the university. She was not afraid of competing with the boys at university and believed she could complete her studies.

5.9 George

The case of George is presented below.

George, aged twenty-six, was a second-year male student at the University of Rwanda. When I met him, he was studying construction management, having majored in mathematics, economics and computing for his advanced high school studies. Before joining the University of Rwanda, George had obtained a diploma in quantity surveying from a College in Uganda. After graduating from College, he established his own company that dealt in quantity surveying and construction. After working for some time, he felt the need to continue with studies at the University to acquire a higher qualification. He wanted to gain more knowledge to complement his skills in surveying and construction. In 2010, he joined the University. In his class, male students were in a slight majority and there were twenty-two males out of a group of forty students. At the time of the interview, he was feeling overwhelmed by studies, and the stress to be able to successfully combine studying and working. George liked his course so much and enjoyed studying with young women. His outgoing nature as exhibited during the interview, made him the class favourite to be elected as the class representative, a post that one holds for a full year. He had found that many students turn to him for help especially the girls when they have problems with their studies.

5.10 Eric

Below is the story of Eric.

Eric was twenty years old when I met him during the time, I conducted the study. He was the second born of five children: three sisters and a brother. When I met him, Eric was a first-year student of mathematics at the University of Rwanda, College of Science and Technology. Before joining the university, he studied at King David Academy where he sat both his 'O' and 'A' level studies. He had both parents – mother and father who had not

attended school at all. His father was a cattle herder and his mother, a farmer. As far as Eric could remember, when he was growing up, he was close to his father while his sisters were closer to his mother. Eric was taught by his father how to graze cattle and to prepare and process milk which was at times meant for sale or was to be consumed by the family at home. His sisters had learnt to clean the house, they had dairy cows and his sisters were required to wash the milk pots (*ebyanzi*) and also make ghee (*omuzigo*). Besides such household work, Eric told me that his father was a strong advocate for education. Although the family had meagre resources, his father was able to send both his sons and daughters to school. Eric was close to his sisters, and given that he was ahead of them in class, he would guide them in their studies, especially helping them with calculations in mathematics. He also claimed that he encouraged one of his sisters to take up a science combination at 'A' level. Eric admitted that girls pass through several challenges in their educational journey as compared to boys. He added that his sisters could hardly stay up late at school revising their books because their neighbours could negatively judge them. Eric told me that the girls who made it to study science at the university were really courageous, intelligent and confident. In his class of mathematics, Eric observed that girls were few in number. There were only two females in a class of nineteen students. But Eric said that these girls were performing well, in that they could come among the top five.

5.11 David

Below I present the story of David.

David was in his late 40s and was a lecturer in engineering at the University of Rwanda. He had a PhD in structural engineering, which he had received in the late 1990s. By the time I conducted fieldwork, David had worked at the university for around eight years. In addition to his teaching role, David had held several other administrative positions. David told me that on average, there were not quite many students studying engineering as a discipline. Representation of gender mattered to him, there were very few young women on the engineering courses. He supported equally all students in their studies and claimed to never question the value of women's education in science. David told me that the performance results always portrayed women among the best top performers in class. He observed that the admission policy at higher education hindered girls from entering university in big numbers, and that government's affirmative action policies and strategies should extend their focus into

such issues. David described the work that engineers did to be revolved around designing materials, supervising teams on site and getting to work on buildings. He said such work can be done by women but noted that in most cases, women needed to be cautious of their dress code at work.

5.12 Paul

In the next subsection, I present the story of Paul.

Paul was in his early 40s and was a male lecturer of mathematics at the University of Rwanda. He had a PhD in mathematics. By the time I met him during the study, Paul was in charge of the department of mathematics at the university. He lamented that women were a minority in mathematics. He found students to have different ways of learning and told me that he endeavoured to treat girls and boys equally during lectures. Paul observed that to succeed in mathematics, students had to dedicate more time to revision. He was quick to note that some female students excelled and some had to repeat classes. Paul pointed out that female students seeking to balance school and marriage life were always discouraged from completing their courses because mathematics as a discipline required a lot of time, something that most mothers do not have. He was of the view that mathematics is very competitive and for students to maintain their self-image in the discipline, they had to work so hard to succeed. He was impressed with the performance of some girls because they had managed to get first class degrees. He attributed such progress and achievement to the foundation the girls acquired at secondary schools as well as their commitment in studies at the university.

5.13 John

Below I present the story of John.

John was born in 1944 in Gikongoro, part of the Southern Province of Rwanda. The ethnic atrocities that happened in 1959 forced him and his family to seek exile life to Burundi. He returned later to Rwanda in 1994 when RPF captured power. By the time I did this study, John was living in Busaza, a rural suburb of Kigali. He was married and had six children; four boys and two daughters. The children were over 20 years of age. John was from a low middleclass family and hardly remembered his educational journey although he said he studied up to primary two. His wife did not attend formal schooling either. Because of the need to contribute to family income, John left school at an early age and went to work in tea

plantations besides getting involved in other agricultural activities. When I met him, he was a farmer but because of his old age, he could hardly engage in any activity. His wife was also old and they were hiring people to work on their farms. His eldest child was a soldier and had left school after his 'O' levels so that his young siblings could study. John told me about his other young son who studied up to university. Although his daughters were able to go to school, they left after completion of their 'O' levels. John said that one of his daughters liked accounting and the other one wanted to become a teacher. John thought that his daughters opted to study subjects they liked and which they had performed well in. He said if they had continued with school, one of them would have been a banker and the other one a teacher. John wanted his daughters to study up to university, but unfortunately, they left school earlier due to limited financial resources to pay their fees. With such a change in their learning journey, he reckoned that the girls had to get married. They married when they were between 18-20 years of age.

5.14 Peter

Peter's story is presented below.

Peter was born in 1964 and worked as an assistant lecturer at a university in Kigali. Peter was married and had children: three boys and four girls. The children were between 14 and 32 years of age at the time of our interview, with the eldest being a girl. Peter had a master's degree and at the time of the interview, he was considering enrolling for a PhD. The wife studied up to senior two and later enrolled on a vocational course in tailoring. Peter informed me that his eldest daughter was a medical doctor and his sons were still at university studying architecture. Peter said that he encouraged all his children to have big ambitions and confidence to achieve whatever they set their minds to. As a father, Peter did not want to dictate the subjects his children studied at school but wanted them to follow their dreams. He decried the fact that most families do not send their children to school, especially girls. His eldest child, a girl, attended some good schools with a positive teaching and learning environment. At an early age, he could see that his daughter would study medicine at school because her behaviour and actions such as making herbal remedies from plant leaves for her sick siblings. To this, Peter could see that his daughter cared about humanity. Peter told me that his daughter completed her university medical degree and now works in a hospital. However, Peter was not keen to talk about his daughter's achievements and that of his other

female children. He said, as time has gone by, he felt bad about educating his children, particularly his daughters. Peter believed that educating girls was like giving hard-earned money to another family that the daughters will join by marriage. Peter said that his eldest daughter, the medical doctor is married, and does not contribute financially to his family. A lot of money was spent on her education, and Peter thought he would reap some rewards when she finished university and gained employment. Peter hoped that his sons will soon finish university and help him to accomplish some family projects.

5.15 Conclusion

This chapter discusses the biography of the research participants. I have provided information regarding their family and educational background as well as their experiences of studying science as young women at the University of Rwanda. In this chapter, I summarise background information of the participants in order to understand how the context they were raised has influenced their education journey to study science courses at university. Specifically, the chapter shows how the family background of these participants has affected the decisions by these participants to study science at the university. It also discusses the educational context of participants, highlighting the challenges and opportunities they encountered from primary through secondary to university to study science subjects.

Chapter Six

Gendering Science Subjects at University in Rwanda: Family Background and Educational Contexts

6.1 Introduction

In this chapter, I examine the factors that influence the gendering of science subjects at the University of Rwanda. By exploring issues such as family background, community expectations and the school as a space for confirming and concretising numerous gender stereotypes, I demonstrate how a number of socio-economic aspects participate in gendering science subjects at university. The main argument advanced in this chapter is that while there is significant progress being made in primary and secondary schools, there is still gender inequality within higher education particularly in science. This inequality is influenced by deeply rooted socio-economic factors that define men and women in society. In other words, the roles young women are expected to perform determines the subject they choose while at school – more so at the university – so as to develop careers that resonate with society's expectations. In this case, the university becomes one of the platforms through which these aspects are concretised.

Material in this chapter is presented in two main sections. The first section is a discussion of family background as a factor for gendering science subjects at university. In this section, issues ranging from the education and economic status of parents, domestic expectations to family structure influences are at the centre of my discussions on family background. In addition, I discuss community expectations – articulating how marriage and production of children – is a significant factor in contributing to gendering science subjects at university. The last section presents the school as a space for concretising gendered constructions of science at university. By presenting how young children in primary and secondary schools participate in constructing gender stereotypes, this section examines how university becomes a space for encouraging or discouraging young women from pursuing particular careers. I discuss how the school confirms the gendered constructions of science subjects through teaching and learning practices, and assessing of students. In addition, I explore how the school becomes a space where the attitudes of male students and lecturers (both male and female) towards female students studying science subjects are developed and concretised. In the following section, I discuss how family background is a significant factor in enforcing gendered constructions of science subjects at university in Rwanda.

6.2 Family Background

My discussions in this section begin with highlighting feminist ideas on the family as this sets the stage for understanding how the family becomes a platform upon which social attributes of men and women are concretised. In their discussions on the family, Stanley and Wise (1983) demonstrate how feminist theory relates to family issues. They argue that there are two theoretical concepts that arise when discussing feminism in relation to the family and these include: i) socialisation; and ii) sex role. As they define it, “sociali[s]ation is the process by which children are transformed into social beings who have taken on particular norms and values, and know what kind of behaviour are expected of them” (1983, p.87). This process begins at birth when children are assigned a sex, which is based on the appearance of their genitals. Then one goes on to learn behaviours expected of a particular gender and the roles that comes along with it. In the process of socialising someone into a particular gender, parents play a significant role. Stanley and Wise point out that the interaction between the child and its parents plays a fundamental role in shaping the personality of an individual. Stanley and Wise further implore scholars dealing with studies on gender to understand that feminist writers argue that “children identify with parents through either ‘imitation’ or ‘identification’, which of their parents they imitate, and more importantly identify with, is strongly influenced by the relative power of the two parents” (1983, p.89).

The other concept that feminist scholars discuss in relation to family is gender role. Stanley and Wise regard gender role as that “bit of the process by which children come to be not only social beings, but either ‘feminine’ or ‘masculine’ ones [... femininity and masculinity role] involve clusters of attributes and behaviours seen, within particular societies, to be appropriate for females and males respectively” (1993, pp. 93-94). Feminists argue that patriarchy and capitalism, the former denoting male-dominated ideas (Abbott et al., 2005; Ademiruka, 2018; and others) and the latter relating to social class (Acker, 1987; Thomas, 1988; Barrett, 2014), are at the centre of perpetuating sex roles in society. They determine what is expected of men and women in terms of behaviour and the role they are supposed to take on. The present study draws on the above views by Stanley and Wise to show how the family participates in influencing children to study either science or arts and social science subjects at school and later at university. Being the basic unit of socialisation, the family is at the fore of reinforcing the socialisation process of boys and girls into appropriate gender

categories to fulfil the needs of society. Particularly, these ideas enhance an understanding of how parents influence their children's choices of subjects to study at university.

Different issues emerged in relation to family and the education of children and these include: i) the education of the parents; ii) the economic status of the family; iii) family structure;⁶⁹ and iv) the domestic responsibility of the children in the family. Which domestic responsibilities do parents give to their children as they grow up? These are the issues guiding my discussions in this section. To begin with, it is pertinent to expound on how the aspect of education of the parents of children influences the gendering of science subjects at university.

6.2.1 Parental Education

This study has revealed that the education level of one's parents influences the choices of subjects s/he chooses to study at university. As it is often the case with other parents in rural African communities, some parents in rural Rwanda have not acquired formal education. Parents with limited formal education have a greater tendency to be conservative and patriarchal in their understandings of gender, and there is an expectation that women will engage in unpaid work within the family home (Bullock, 1994; Tamale, 2004). In terms of gender roles, boys are prepared for responsibilities such as looking after cattle in the field, clearing fields for farming as well as constructing houses. Conversely, girls are socialised into becoming mothers and housewives. This relates to the viewpoints expressed by Huggins and Randell (2007) in their work on gender equality in education in Rwanda. Huggins and Randell point out that in most cases, the education given to boys is intended to prepare them for administration and developmental activities. According to Huggins and Randell, "girls education focused on developing skills which reinforced their socialised roles, such as secretarial skills, home economics and general hygiene" (2007, p. 16).

In fact, some of the parents I interviewed showed that they had influenced their male children to study sciences at university, thus concretising the gendering of science subjects at the University of Rwanda. To illustrate this, I want to draw from the case of a parent, John,

⁶⁹ By family structure, reference is made to whether it is a single-parent family, a monogamous or polygamous family. Monogamous families denote a situation where a man has only one wife and polygamous family refers to a situation where the man has more than one wife.

who was a farmer in rural Kigali. By the time I did fieldwork in 2013, John was aged sixty-nine years having been born in 1944 and was staying in Busaza, a semi-urban area in Kigali. Due to the ethnic rivalry that heightened during the 1950s, John went into exile in Burundi in 1959 with his family. He only returned to Rwanda in 1994 when the RPF government came into power. By the time he returned to Rwanda, John had six children (four sons and two daughters). Although John was not interested in delving into the details about his education, he told me that he stopped in primary two. After leaving school, John went to work in tea plantations besides involving in other agricultural activities. His wife, who was almost the same age as John, did not attend school at all. When I interacted with John, his two daughters were not at school. They had got married about five years ago. However, his youngest son was still at school, studying ICT at the University of Rwanda. John told me about his elder son who was in the military service and how he encouraged him to help the young brother finish his studies. John reported that:

I have two daughters and four sons and I have managed to at least send them to school. With my daughters, they stopped in senior four and dropped out of school. I could not manage to pay their 'A' level fees and also cater for other basics at home. I really wanted my daughters to continue to university but because of limited finances, they dropped out and later got married. My youngest son is the one who has managed to continue to study at university because his elder brother who is a soldier helps with finances. I have told that son of mine [the soldier] to really help his young brother finish school so he can be somebody – you know he is a man. If this child of mine was a girl, maybe I would encourage her to get married at such an early age.

As said above, why did John not ask his elder son to also pay school fees for his two daughters? Why did he leave them to get married? These questions are pertinent in understanding the influence of patriarchy on parents' decisions in educating their sons or daughters. Although John had very little formal education, 'his' culture taught him that girls can get married and be taken care of by their husbands. In fact, the traditional Rwandan society considers women as people who belong to the family of their husbands (Uwineza and Pearson, 2009). To use the words of Abbott et al. on feminism, John 'internalis[ed] patriarchal ideas and transmit[ted] them to [...] [his] own children' (2005, p. 147). As he let the daughters get married, the sons were looked at as people who should stay and sustain their father's lineage. In cases when a parent is to choose between supporting a son and a daughter when it comes to education, the former is usually given the chance over the latter. Resources (including money) are directed to support the boy as part of the process to prepare him for roles in administration and related activities. This idea re-echoes Edewor's (2006)

insights on the value of educating boys among the Isoko of Nigeria. Unlike girls, Edewor points out that the Isoko put emphasis on the education of boys since these are looked at as people who will perpetuate the family name and support parents in old age.

Moreover, the lack of education by parents deprives the child a chance to have someone crosscheck homework in order to help them understand certain phenomena. In their article on the effects of parental education on the schooling of girls and boys in Niger, Glick and Sahn (2000) argue that ‘the education of parents is one of the most important determinants of child schooling’ (p.64). In cases where parents are educated, chances are high that both girls and boys will be given the opportunity to attend school. Similarly, where parents are educated, they can work together with their children to accomplish their homework. As will be pointed out in later discussions, educated parents also guide their children on the career path one may need to follow.

The example of Belinda, a first-year student of food science and technology can be quoted to demonstrate how the education level of parents influences the subjects one studies at school and later at university. Belinda was 25 years old when I first met her. She told me that her father died in 2005 when she had just finished primary seven in Uganda. She came to Rwanda in 2007 to continue her secondary education. Although Belinda was able to study sciences at university, she pointed to the fact that her challenges to study science subjects were compounded by the illiteracy of her parents. Belinda told me that her father dropped out of school after primary six while the mother did not study at all. Despite the father being able to see the marks on the report card and asking her why she did not score specific marks, he was not able to help with homework and did not encourage her to pursue the subjects of her dreams. As she told me, Belinda was able to pursue science subjects up to university due to her persistence and hard work. I will return to these issues in Chapter Seven while discussing how young women negotiate gendered constructions of science at university in Rwanda. In the ensuing paragraphs, I discuss how parents with formal education have influenced the choice of their children’s subjects.

Unlike their counterparts who have not acquired formal education or those with very little education, available literature shows that educated parents tend to encourage their children to study and aim higher. Such parents also tend to give equal education opportunities to both boys and girls. In situations where the mother is educated, she prefers to ensure that her

daughters are educated, an ambition that is rarely supported by the husband. Glick and Sahn summarise these issues as follows “maternal and paternal schooling have equivalent effects on the education of boys and girls. It might be expected that educated women have both strong preferences for schooling their daughters [...] and the ability to ensure that household resources are allocated for this purpose” (2000, p.64). These scholars also point out that ‘men who chose educated wives also have a preference for educated daughters’ (p. 68). These are the ideas that are revealed through the present study. From the samples of the interviews conducted, my study suggests that parents with a more formal education are more likely to encourage their children to aim higher in education. Such parents support their children to do homework, prepare for school, and go to parents’ and teachers’ meetings at school in order to know the progress of their children.

To illustrate this, it is pertinent to draw on the case of Brenda. Brenda, born in 1990, was a third-year female student studying estate management and evaluation at the College of Science and Technology, University of Rwanda. She was raised in Tanzania with parents of Rwandan descent. By the time I met her for the interview, Brenda had a sister who had completed a medical degree at university. With the overthrow of the government during the 1994 conflict, her parents were able to relocate back to Rwanda. Although she attended her early years of school (primary school) in Tanzania, she went to secondary school in Rwanda and was able to major in science subjects until university. When I met Brenda, it was revealed to me that both her parents were successful scientists: the father was a veterinary doctor while the mother was a nurse. Brenda draws inspiration and support from her parents and the sister - a fact that helped her prepare better for school. Her parents have bought her books to supplement those she finds at school and have done everything possible to make sure that she studies and performs well in school. In her own words, Brenda said that:

I have both parents, and my father is a veterinary doctor and mother is a nurse. We are two children and my sister has been studying a medical degree at university. My parents motivated me that it would be a good thing to pursue science subjects at secondary and university. They bought me science books and this made me feel different at school. My parents helped me understand the texts in the books. In the morning, my parents would prepare me for school and also endeavour to pick me up in the evenings when school was done. They would help me with homework, visit me at school to check on my progress with teachers and know them as well. Also, my dad and mum could come to school to attend parents' meetings. So, my parents contributed a lot in my choice of subjects. When they encourage you then you have that positive attitude that you can make it.

Similarly, the case of Judith, a second-year student of biology during the time I conducted this study demonstrates that educated parents are more likely to encourage children to follow in their footsteps. Judith was twenty-eight years old. Her father had been a medical doctor and her mother, an agronomist. Judith told me that her parents were crucial in shaping her perception and approach to learning, although both her father and mother died before she reached both 'O' and 'A' level. Judith credited her mother with encouraging her to study. Coupled with the encouragement Judith had from her father that she needed to study hard and become a medical doctor like him, Judith became not only ambitious but hard working as well. In relation to how her parents motivated her to study hard and achieve great heights in education, Judith said that:

My father was a medical doctor and head of the family planning unit in Rwanda. He was transferred to Gikongoro and that is where he met my mother and got married [...] It is where I [was] born, in Gikongoro. My mother was born there and she worked in the Ministry of Agriculture as an agronomist. But they all died. My father died during the genocide. For mum, she died after the genocide[...] when dad died, I was 5 years old, and for mum I was seven years old. After my parents' deaths, there was someone who took care of me and my little brother. My parents had three children, one died but I do not know [what really happened to him]. [He just] went missing during the genocide period. By the time my parents died, I had just started primary school. I remember being with my dad and him telling me that I should study medicine and be a doctor like him. And being the eldest child, he really wanted me to follow in his footsteps; it's then that I felt that I should be a doctor and there is no way I could be one without studying sciences. For my mother, she was a bit strict and so concerned with how I behaved at school. She was always telling me – you my daughter, study hard, always do your homework, because today I am able to cater for your needs, but if tomorrow am not here with you, life will be hard.

Nelly, a second-year student studying construction management also told of a similar story about having both of her parents encouraging her to study. Nelly's parents had formal education, although they did not attain university education. When Nelly was asked

specifically how her parents contributed to her educational success, she cited how her mother taught her to read and how she could spend hours with her sitting at the table practicing spelling and maths homework. Like her father, reading was a favourite way of learning new things, a hobby he instilled in his children both boys and girls. Nelly acknowledged that this was not always the case with other families. Nelly expressed her opinion that she has seen families where fathers have supported the education of sons at the expense of their daughters. Although her parents died after she had completed primary six, they had sent their daughter a positive message to continue with her education. Nelly told me that:

Ahh we live in Kacyiru at the moment. My parents were soldiers; my mother was working in police and father in the military. I was very close to both my parents. My mum used to teach us to read, and I remember before going to bed, she would want to find out what I had learnt at school. She would then read through my notes and homework and help me collect the errors. Dad was very busy [...] used not to be around, but when at home we shared breakfast, lunch everything but he used not to be around many times...but when back he could avail his time and teach us to read books. You know I have brothers, but dad would encourage all of us to study hard at school. My dad actually wanted me to do pure mathematics in high school. In those days there was biochemistry and mathematics but they wanted me to study maths.

The cases of Belinda, Brenda, Judith and Nelly show how the education level of parents influences the education of their children. In the following subsection, I discuss how the income of one's parents plays a crucial role towards the education of one's children.

6.2.2 Parental Income

Another issue that reoccurred in terms of the gendering of science subjects at the University of Rwanda is related to the economic status of the family. Is it a wealthy family or poor family? What kind of job do the parents do? As it was revealed to me, the education of females and males was determined by the class of their families, especially when defined in terms of material wealth. To understand people's economic welfare in Rwanda, it is important to throw some light on how society is characterised by the government. Rwanda categorises the economic status of people through a homegrown development programme known as *Ubudehe*. *Ubudehe* is a kind of scheme through which the GoR uses to defines who is poor, middle class or rich with a view of understanding people's poverty levels and how to mitigate them. Through this programme, the government identifies four categories of people along the poverty trajectory: by the year 2016, 16% of the population was categorised as very

poor; 29.8% as poor; 53.7% as middle class and 0.5% as professionals or upper class (Niyitegeka, 2016).

Considering that the Rwandan population is about 10.5 million people according to statistics by NISR (2014), to have 0.5 % as professionals implies that this category of people is very minimal in the country. Based on these statistics, it demonstrates that still a high percentage of the population is poor and consequently unable to secure rent, food and other basic necessities of life (Mbonyinshuti and Kwibuka, 2015). Because science subjects are relatively expensive in terms of securing text books, attending science fairs and acquiring laboratory equipment, fewer households can manage to sponsor their children for these courses at university (Masanja, 2010).

While one would expect that people who live in rural Rwanda are endowed with agricultural products which they can sell and earn money from to take their children to school, my research reveals that people from rural areas find it difficult to get money to support their children at school. Besides confronting the unpredictable conditions of weather and grappling with poor farming techniques, rural dwellers may not find a ready market for their agricultural products. When they do, these prices are too low to support one's children in school, let alone for science-related courses. Moreover, 'because of low levels of skill and education, the rural poor, whose labour cannot be absorbed by the family farms, are forced into unattractive poorly paid wage labour in the informal economy' (Abbott et al., 2013, p.17), thus complicating their chances of affording good education for their children.⁷⁰ Among the cases that can be quoted to affirm this is Claudine, a second-year student of biology.

Claudine grew up in poverty, in a family of seven, in rural Nyamagabe, the Southern Province of Rwanda. Neither of her parents had a formal education. Claudine's father worked in people's farms to make a living while her mother stayed at home to look after the children. To Claudine it was not a typical household, which she used to hear some of her classmates talk about when she interacted with them at school. Her classmates could take lunch to school, had good clothing, matching stocks and shoes. Hers was a situation where she could go hungry both at home and at school as her family could not afford to pack lunch for her to

⁷⁰ While primary school net enrolment rates had risen (98% in 2016) due to the elimination of school fees by the government in 2003, progress remains uneven. In certain parts of Rwanda, some children drop out of school due to school related costs such as uniforms, books and examination fees.

take to school. Besides that, there was not enough money for fees, uniform and exercise books, and together with her siblings, she hardly attended school. Even though Claudine persisted with school, she had no idea if she would complete her primary school studies and later on continue to secondary school. She described how some district officials helped her cover some of her school fees and it was the reason she was able to complete her 'O' levels. Claudine never knew she would get the finances to continue with her 'A' level schooling, but her friends at school and a teacher who lived in the neighbourhood encouraged her to persist and she kept going with the confidence that she could find a way. Claudine told me that:

My dad is an agricultural labourer, he tends to other people's farms. For us we do not have a farm. My mother stays at home to look after my sisters and brothers. I come from a poor background. Studying as a girl was difficult for me like when I was in need of books, I could not get them. My life was not easy. I remember after completing primary school and joining secondary school at Mushubi that is in Nyamagambe district, life was hard as my parents could hardly take care of my needs. I could even go to school on an empty stomach, and the school was very far away from home. I had to walk a long distance to get to school and could get there so tired and hungry. If at least I was given some pocket money, I would have been able to buy snacks at school but there was no money. Even when I was at school, I was not sure that if I returned home, I could get something to eat. Life was hard but I managed to complete primary school then continued to senior one, but dropped out in senior two, then after got a chance to resume my studies. The district officials are the ones who used to help me with my fees. It is then after paying fees that I would be allowed back to school. After my senior two, I was promoted to senior three and successfully passed my 'O' level exams, and because I liked medical sciences, I chose to continue my studies at 'A' level in biology and chemistry. I was not even sure of where to get money to pay my school fees. I tell you; it is by luck that it got paid and I finished my 'A' levels and later passed to join university.

One of the other girls interviewed, Belinda, also lamented about her family poverty and how it affected her primary and secondary schooling. She said that:

You know I grew up in the village in Luwero, that is Uganda; you might think things were affordable and that parents could afford the basic needs of their children. It is not true; education was not really free even in primary school. My dad was in the cattle business but still he could fail to raise the small amount of money needed at school. I could be chased away from school and miss classes. My father and mother really wished their children to go to school but when they failed to raise the money, some of my siblings could not continue with school, they dropped out. As for me, it is just by luck and also having a few Samaritans who helped me along the way of my schooling that I continued up to university.

Janet, a first-year student of water and environmental engineering also shared her experience of financial struggle. Her father was a farmer, while her mother tilled the land, and that was the main source of their family income. Janet said that the burden of school fees, exercise

books and examination fees is an obstacle she faced in her studies both at primary and secondary school. To continue with her studies, she had to find people to support her education up to university level. Janet told me that:

Finances ...it was not a very good time for me either in primary or secondary school. My father reared and sold cattle but he did not earn enough money to look after all of us kids in terms of fees and scholastic materials we needed. Even mum tilled the land and sold some of the agricultural produce, still money was not enough for all of us at home, in terms of meeting our basic needs. Life was generally difficult when I was growing up.

By sharing their story, Claudine, Belinda and Janet made me remember my own learning journey. I recalled how I struggled to excel at school despite the challenges my parents used to go through to raise my school fees. My father earned a small amount from the work he did as a freelance land surveyor. When I finally got a scholarship to study at the university, I considered myself very lucky given the hardships I had gone through while at primary and high school. Although I did not study in the rural context, like the cases of Claudine, Belinda and Janet have demonstrated, my situation shows that in the Rwandan context, just like other African societies, young women negotiate numerous financial challenges to complete university.

On the other hand, people in urban areas are usually better off than their counterparts in villages. Urban dwellers engage in a variety of activities including business, office jobs and financial credit facilities and are able to educate their children, particularly facilitating them to study science subjects. Such parents are able to acquire the necessary requirements - purchasing textbooks, mathematical sets, calculators, among others. Going back to the case of Brenda, she was studying in Kigali City. Both the father and mother were government employees in Kigali. Brenda's parents gave her the support that she needed to excel in her studies. Besides paying school fees for her, they also provided books, paid for her trips to attend science fairs and gave her pocket money to cater for other necessities at school. Having joined a more academically effective primary and secondary school, it was obvious for Brenda to have higher attainment in core subjects and most likely to make progress in the subjects she studied to join university. Brenda said that:

My parents chose some good schools for me [...] I attended primary school in some school in Tanzania and for my secondary school studies I joined FAWE Girls' School. They used to pay my fees on time, bought text books for me, could visit me at school, especially that I was in a boarding school ... [They] would also check on my progress in the subjects being taught. I used to do well in English [and] science while at primary school. In secondary school, I did quite many subjects like, biology, chemistry, mathematics, and physics but when I got in senior four, I had to specialise in subjects I was excelling in, that is, physics, chemistry and mathematics (PCM).

The other case I would like to quote here is that of a parent teaching at a university in Rwanda whose economic support to his daughter impacted her learning journey to becoming a medical doctor. Peter, a parent lecturing at a university had this to say:

I work as an assistant lecturer at this university. My experience is long but in brief, professionally, I have more than twenty years working experience. I taught in secondary school. I was the headmaster of a secondary school, I taught at Makerere University, and I am teaching here at the College of Education after I got my master's degree from Makerere University. Currently, I am writing my thesis for my PhD [...] despite being *mzee* [old] (we both laugh). I want to get that degree before I retire so that I can be able to work in some private universities and be a consultant in educational issues. One of my children [...] my first-born, a daughter, is a medical doctor now. She is thirty-two years old. As a parent, I have supported her since she was young at primary school. In fact, I just encourage my children to work hard at school. I do not influence them to choose particular subjects of study because I am not the one studying for them [...]. I cannot force them to do particular specialisations. I just encourage them and advise about the domains of education, about the requirements, courses, tell them the problems they will face and also let them know that they must be strong in this and that, but I don't choose for them subjects to study at the university. The choices of subjects my sons and daughters have picked are according to their talent and capacity like the one who did medicine. But I know when my daughter was growing up, I could see how she could find a young sister or brother with a wound, she would want to treat them, by looking for traditional medicine in the plantations, those plant medicines and [give them to] drink; sometimes she could care for those young ones when sick at home. Then, I realised that she likes medicine and it is what she studied at university.

From these excerpts, it becomes evident that the economic status of a family is one of the significant factors that contributes to the gendering of science subjects at university. Sciences have been constructed as disciplines for people who can afford specific requirements at school and those who can afford to take their children to good schools (those with good teachers, laboratory services and the curriculum is aligned to the teaching of science subjects). Moreover, sciences are courses for children with parents who buy for them textbooks, provide them money to go to science fairs and other related trainings. And since some parents look at boys as the 'bona-fide' heirs of their homes, they are the ones

constructed as bona fide people to study science subjects at all levels of education. During my interaction with John as alluded to in this section, he said that he was a farmer and therefore could not manage to educate all his children – both boys and girls. When he was forced to make a choice between his sons and daughters to continue with school, he chose to give priority to the former. More so, he emphasised to his son (the soldier) that his young son should be enrolled for sciences. According to Egbo (2000), Subrahmanian (2003), and Yaya (2008), some parents are not ready to spend huge sums of money on female children since girls are likely to get married when they grow up.

Husbands, in her article on the place of women in higher education published about four and a half decades ago, re-echoes some of these issues. Among other things, Husbands demonstrates how the socio-economic status of parents is one of the significant factors that influence women to enrol at college and university in the United States. As she explains, women who come from backgrounds with higher economic status have a relatively equal chance to attain education at college and university level as their male counterparts from a similar economic background. However, the gender gap is more pronounced when considering the educational attainment of males and females from economically disadvantaged backgrounds. For example, in situations where the economic status of the family is low, women do not always get an equal opportunity to proceed with their education up to university level compared with males. To this end, Husbands notes that “lower-class parents place more emphasis on higher education for boys than girls, while middle-class parents see college as appropriate for their daughters, if only as preparation for marriage to a suitable mate” (1972, p.262).

Another factor that Husbands brings forward in relation to socio-economic factors as an influence to the acquisition of higher education relates to funding from educational institutions in the form of scholarships. As she has noted, “colleges may be less generous in awarding financial support to women than to men. Those women of lower socioeconomic status who do not receive scholarship assistance may simply not enrol in college; alternative sources of support are not great, as part-time jobs for women are rarely lucrative and parents may not be anxious to go into debt for the education of a daughter whose earning future they see as uncertain” (Ibid, p. 262). These observations relate with the findings of the present study as I have already discussed. Another issue associated with family background as a factor for gendering sciences at the university is family structure. In other words, how does

the set-up of one's family – in terms of whether it is a single parent, a monogamous or polygamous family – influence the gendering of science subjects at university? These are some of the issues that are tackled in the following subsection.

6.2.3 Family Structure: Single Parenthood, Monogamy and Polygamy

In Chapter Two, I demonstrated how scholarly work on women in science in Africa brings to the fore the relationship between family background and children's choice of subjects to study at university. Besides the level of education of the father, mother and other siblings in the family, and the nature of the jobs they do, the background of one's family impacts on the choice of subjects someone studies when she or he joins university. Although Buchmann (2000) work tackles children's schooling, her ideas can be re-echoed to highlight how family structure influences a person's studies at university. Buchmann shows how the issue of polygamous and monogamous families influences the education of children in a home, noting how the nature of needs in each of these families impacts the education of the children in a home. Following on from Claudine's earlier comments on pages 97-98, at this stage in the interview, Claudine also went on to describe how her father came to marry another woman and could hardly take care of their needs at home, an experience which had an impact on her learning journey to higher education. I capture her story in the excerpt below:

Concerning me, it is still a long story. At a certain time, our father left us and went on to marry another woman.⁷¹ There arose so many problems on my side, my other sisters and brothers and on our mother's side. My mother did not know what to do but she remained with us at home - she did not abandon us. She just became sickly and could not manage to dig for long hours. And now food became more of a problem because as a family we could hardly get enough to eat. When daddy was still around, we could at least afford to buy food at the market from the little money he earned as a labourer. I tell you in the absence of our dad at home, life became so hard for us, because now the money our father was earning was diverted to the other woman he married. So, every child at home had to become responsible for their own life. Dad could not buy us books or pay fees or even encourage us to go to school. The situation became hard, and all my siblings dropped out of school due to lack of school materials and fees. The reason as to why I am at this education level, in contrast to my young sisters, is because I experienced so much pain and I did not want to see my mother and siblings live a life of rejection and shame. So, I decided to study under difficult conditions so as to complete university.

⁷¹ Uwineza and Pearson (2009) note that the Rwandan law prohibits polygamy. However, in some regions in Rwanda it continues to be widespread.

Besides the issue of polygamy, as pointed out above, there is also the issue of single parenthood resulting from the death of a partner and how it influences the education of children, especially the girl-child. Relating her viewpoints to women in the post-genocide government, Burnet (2008) notes that some women in Rwanda have been successful with their careers, while others have had to shield the burden of providing for their families. As she writes, “For peasant women in rural areas, the absence of husbands increased the burden of crushing poverty as well as social isolation. Farming without their husband’s labour resulted in a heavier workload and lower yields as well as reduced social status in the community where no one had ‘time’ to hear about [people’s problems] or assist with ‘widows’ problems ... [such low yields did not leave people with enough] cash to pay for [...] school fees” (p.385).

The cases of Belinda and Janet also attest to the above discussions. Belinda commented that:

When my father died in 2005, we had a challenging time with my mother. His death really affected me, my young sisters and brothers and also my mother. We faced hard times. My mother used to go out and dig in the gardens so we could get something to eat. Since she never went to school, there is nothing else she could do. After becoming an orphan and meeting a very challenging life, I left Uganda and came to Rwanda. We had difficult times as a family and studying was a problem too. Mother could no longer take care of us [...] Passing through such difficult times of being an orphan gave me strength to study.

Similarly, the assertions of Janet re-echoed Belinda’s experiences. Janet talked at some length about how the death of her father impacted on her learning journey. Her father died before Janet completed school. When Janet’s father died, her mother was not in a good position to finance her studies. It was her uncle who supported her financially and she was able to complete both her ‘O’ and ‘A’ level studies and then continued to university. Recounting her story, Janet told me that:

When my daddy died, it was mum taking care of me, my other sisters and brothers. It was not easy for her to support me in every angle of life most especially in studies. There was no money but again my mama was like Janet will study. I could not get to know where the money was coming from because we were not rich. But most of the time, I think for the parents when a child is born, gets to reach an age to start school, so supporting you at school is something that should happen and parents try that much to see that a child starts primary school. But it reached a time when my mother could not afford to pay my fees and then uncle came to pick me from school in Uganda and brought me to Rwanda. It is from Rwanda that I continued my ‘O’ and ‘A’ level studies, passed well my examinations and then was enrolled at university.

Just as Janet, Belinda and Claudine came from a background with a single parent, Christine also had a single parent – the mother. Christine was a twenty-two-year-old female student studying biology in her final year when I met her in 2013. She was the first born in a family of two children (both girls). Her father died when she was in primary one. The mother, who doubles as an accountant and businesswoman, was the one taking care of Christine. Based on her background, one would think that in spite of Christine being an orphan, she would not have challenges with school. During our interaction, she pointed to the fact that she missed out on certain necessities and perhaps these could have been provided for by the father. Christine's experiences were summarised as follows:

I have my mummy only and she is a businesswoman. She is the only one looking after me and my young sister. We are only two children. My father died when I was still very young and I think when I was in primary one. So, it is my mummy who has been looking after me, paying all my school dues. But there are some study trips that I missed out on because mummy could not afford to pay for me. It is not very easy for her without dad, but she tries.

These sentiments by Christine relate to Burnet's ideas on gender relations in Rwanda. She writes that "Even the most successful business women lament [...] the heavy burden of bearing sole financial responsibility for themselves and their [female children] – not to mention the social, emotional, and psychological consequences of widowhood or single motherhood." These issues eventually influence young women's schooling and particularly the nature of the subjects they may want to study at university. In the next subsection, I discuss how domestic responsibilities also impact on the gendering of subjects at university in Rwanda.

6.2.4 Domestic Responsibilities

On this issue, let me begin with a quote from Payne (1980) in her work entitled *Sexist Ideology and Education*. Payne observes that,

In our society, girls are socialised into the expectation that their primary role will be one of wife and mother and once this expectation is accepted and internali[s]ed, the continuation of the existing sexual division of labour is ensured. The results are observable. Girls expect to be wives and mothers, they make decisions about their lives in the light of this expectation and they become wives and mothers, thereby providing the evidence that the primary role of girls is to become wives and mothers (1980, p.32).

From Payne's viewpoint, it is clear that families socialise their children into roles that will lead them into being wives or husbands in a home. As wives, for example, girls are expected

to learn how to cook, wash dishes, clean the kitchen, fetch water and take care of the sick. As they grow and go to school, these roles are not only concretised through interaction with other children, but also through the subjects they are expected to study. This view is also discussed by Sherif, in her work on women representation in scientific fields in Niger. Sherif notes that the “internalisation of [the roles of girls and boys] during the socialisation process makes girls [and boys to venture into different subjects at school]” (2008, p. 56).

Eric was a first-year male student studying mathematics at the University of Rwanda. At the time I met him during fieldwork, he was aged twenty-one. In addition to his younger brother, Eric also had three younger sisters. His view of the subjects boys and girls are expected to study at university could have been influenced by the roles they perform at home. Eric told me that:

Girls and boys are trained in different ways because you will see that a boy is trained by his father and a girl is trained by her mother. I have seen this in my family; my father trains the boys and mother trains the girls. What my mother does is to teach my sisters how to prepare and decorate a table, how to cook food and wash clothes. This is what my mother will teach my sisters. My sisters ask whether our father has had breakfast and we boys cannot think of this. It is something which in Rwanda I do not know where it comes from. You find that a girl is busied and asks did the father have breakfast? Are his shoes cleaned? But a boy cannot think whether his father’s shoes are cleaned or not. And my father has taught us boys how to organise things and how to solve family problems. My parents, for example, did not have the chance to study, they are cultivators and farmers, which means that something I had to know is to wake up early in the morning and be at the cowshed to help my father to milk the cows, cut grass or help graze cattle, and as I grew up, I did not have to wait to be told because I knew that was my responsibility.

Related to the above is the time a girl or boy takes to perform her/his allocated roles at home. How much time does a boy take to cut down a tree, collect firewood or fix a faulty TV? Likewise, how long does it take the girl to prepare food considering that this process involves fetching water, peeling (in case someone is to cook Irish potatoes or bananas), preparing the ingredients, making the fire and putting the food on the fire to cook? There is also the time one takes to ensure that the food is served besides washing the dishes after eating. In the Rwandan setting, girls also have to take *umweyo* (a traditional broom) to sweep not only the dining room, but also the kitchen after serving food. This study has revealed that such notions on role expectations create significant effects on the education of both girls and boys. The study has established that in situations where boys and girls are given homework, the time factor will not favour the girl to complete that work since she will be expected to help the mother with domestic chores (see also Sutton, 1998; Bhalalusesa, 2000; Yaya, 2008). In other

words, the girl will spend most of the time cooking and serving other family members, unlike the boy who is most likely to concentrate on his homework. In the following excerpt, I present the experiences of Janet, a student of water and environmental engineering as an example:

Mathematics was always difficult for me and I did not pass it well ...we have many hours allocated to it like 10 hours, so it really needs a lot of time for me to concentrate studying it. Yet we as girls cannot get enough time like [boys]. So, if I get home, I put away my books and get involved in domestic work. And if the housemaid is not around, I have to be responsible for everything as the eldest daughter in a home. You see, I have my brothers but they do not do anything ... cannot wash dishes and cannot cook. So, when I am at home it is all about me and work. My brothers think such kind of work is for girls. For example, if I prepare food and tell him to take care of it, like when I have to go to the shops, [my brother could say] I should hurry or else the food will get burnt. He says that no boy is meant to cook or be in the kitchen [apart from a girl].

Claudine also told of a similar story, and as one of the eldest of five children in a home, claimed that she and her mother did most of the housework. She acknowledged that as a female child, and the eldest of all her siblings, including one girl and three boys, she had to bear the responsibilities of cleaning up the house, cooking an evening meal and washing up the utensils. Claudine disclosed her routine from school as follows:

So, I return back home from a long journey walk from school. It's about 6.00pm I returned. My mother was always tired from the day's work which included washing clothes, digging, going to the market to buy food or sell off some of the produce. Imagine all the stuff that mother did, and at times I could find she's sick and she can hardly do anything like cooking for us dinner. Then I cook, wash the plates, clean around the sitting room and after like around 10.00pm, I start doing homework or revising my books to prepare for the morning class. But by that time [10pm) I am tired and cannot concentrate so well. So generally, it's me, my sister and mum who do housework. My dad is not here and my brothers don't want to do anything apart from fetching firewood.

From these discussions, it becomes plausible to argue that within the context of Rwanda, the chores given to boys are significantly fewer than girls - and therefore socialisation at family level impacts on the nature of subjects young women and men are likely to study at the university. Due to their need to become managers, heads of families and people expected to be in charge of the public sphere (Tamale, 2004; Huggins and Randell, 2007), boys are more likely to study science subjects at university than their female counterparts since the latter's social roles do not prepare them to enrol in these subjects (Beoku-Betts, 1998). In the following subsection, I discuss community expectations and show how they influence the gendering process of science at university in Rwanda.

6.2.5 Community Expectations

Generally, in this study, what I am considering as a community is a group of people living together in a specific place. Although it may not be possible to determine the collective identity of people as identities are usually fluid (Archer et al., 2010), communities are always guided by certain norms and beliefs (Mbiti, 1975). In the traditional African setting, despite someone primarily belonging to a family, s/he is part of a larger community, which comprises extended families – uncles, aunties, cousins, brothers and sisters, grandmothers and fathers-in-laws – as well as neighbours.

It is important to note that African worldviews emphasise communal rather than individual life (Buchmann, 2000). As such, what is considered as something that will benefit the community is more emphasised than what an individual can benefit from. In relation to gender roles, communities have their own expectations about girls and boys and therefore strive to nurture their members into ways that conform with the roles someone is expected to play. In other words, community members always ascribe particular roles to boys and girls, the kind of roles they tend to enforce through superstitions and taboos. In this section, I discuss marriage and production of children as some of the community expectations from young men and women and show how they participate in the gendering of science subjects at university in Rwanda.

6.2.5.1 Marriage and Schooling

Marriage is one of the virtues that many communities in Africa expect boys and girls to accomplish in life. In spite of not having specific rituals to initiate boys and girls into adulthood such as through circumcision, marriage marks a transition from childhood into adulthood in society. Uwineza and Pearson (2009)'s insights on the influence of indigenous culture and post-genocide politics in Rwanda is significant in demonstrating how communities emphasised the marriage of their daughters. These scholars write that,

Rwandan culture placed great importance on marriage, and married women and men were given special respect and recognition in society. As with other cultural practices, marriage, in some ways [...] subordinated women within a patriarchal system of authority. In the days preceding a wedding, for instance, aunts and other elderly women counselled a bride on the duties of marriage. This advice generally focused on the woman's responsibility to respect her husband and his family and emphasise[s] her obligation to be subservient to her husband. Married women were no longer permitted to act as girls, climbing trees or milking cows [which trades they were to discard immediately] (Uwineza and Pearson, 2009, p.10).

As such, whenever girls began their menstrual periods, even if they were just 14 years, they were expected to get married (Tamale, 2005). Parents, especially mothers, ensured that their daughters got married at the 'required' age.⁷² Despite marriage being a mandatory issue for girls and boys, it affected girls more than boys. Not only did parents come to the fore on issues of their children's marriage, it was the duty of members of the extended family to see to it that the children are married. For example, *nyococenge* (the paternal aunt) played a crucial role in the marriage process of her brother's children: she demonstrates interest in whether her nieces and nephews have suitors or not, teaches them how to be a good wife while in the husband's home.

Community expectations such as those on marriage as elucidated above also influence the gendering of science subjects at university. The community constructs girls who have attained adolescence as people who need to get married and usually discourages them from furthering their education (Shabaya and Konada-Agyemang, 2010). Buchmann (2000) echoes the above ideas when she points out that at community level especially in African settings, people (especially girls) are discouraged from acquiring formal education, something that may be related to the need to have these girls get married and begin their own families. These views align with what Janet told me:

When I used to go back home [in the village] for holidays to see my mother, sisters and brothers, people in the neighbourhood would inquire if I am still studying. I remember I had just joined senior five and these people would ask me when I will finish studies and get married. In fact, every time school closed and I went back home, I would face such questions, and this puzzled me a lot because for me I wanted to study and finish my 'A' levels and then proceed to university.

⁷² The marriage law in Rwanda stipulates that girls and boys are supposed to get married at twenty-one years of age. Those who get married before this age are considered to have eloped without what can be termed the consent of the State.

Despite girls having the ‘opportunity’ to go to school and later at university, gender constructions (in terms of how they should be raised, how they need to prepare for marriage and their obligation to get married at a particular age) influence the choice of subjects to study at university. As also noted in relation to domestic duties, girls are expected to cook, serve food and wash dishes at home. These roles influence them to study subjects, which concretise such positions in society – subjects like history, religious studies and home economics tend to produce storytellers, loving and meek people as well as people who are able to cook and manage the home effectively. In relation to the discussion under this subsection, the need to get married at a specific age forces young women to study subjects which do not require one to spend a lot of time at school. To achieve this, one picks mainly arts and social science subjects, leaving sciences to boys since they can withstand the demand of staying at school for a longer period. This is similar to what George, a second-year student of construction management, emphasised. When I met him in 2013, George was aged 26 years. He had obtained a diploma in quantity surveying from a College in Uganda. After working for some time, he felt the need to continue with studies to acquire a university qualification. George underscored the fact that in his class of 40, men were 28 thus making up the majority of the students. According to George, most girls in his programme dropped out and hurried to marry since the programme takes a longer period of time to be completed. George said that:

When the academic year started while in year one, we were many students and also girls were many. But now we are few students, most of the girls have dropped out to get married. Some have changed the course of study to biology or chemistry, which they say is not very hard and takes few years to finish. They say that four years is such a long period to study and they cannot imagine being in school for such a long-time studying construction.

The above idea was also brought up by Paul, a lecturer of mathematics who argued that:

Most students get married in their fourth year, then later get pregnant and this [...] disturbs women since they cannot concentrate on studies. It would be better if they focused on academics and then marry later after completing their studies.

All these discussions show that young women strive to fulfil their marriage obligations as the community demands at the expense of their career aspirations. My own experience can also be shared here as an example. As I have already noted in Chapter Four, most of my research participants looked at me as someone who had overstayed at school and was getting ‘late’ to get married. During fieldwork, for example, when I met some people, they would ask questions to do with marriage. When are you getting married? Do you have a suitable suitor?

If you do not have, can we get one for you? All these questions implied that I had taken a lot of time to get married thus going against the expectations of the society (see also Delamont, 1980, pp.69-70). In the following subsection, I discuss how the construction of women as mothers and people who should nurture children influences young women's choice of science subjects at university.

6.2.5.2 Bearing Children

Related to the question of marriage is the need to produce, raise and nurture children as one of the community expectations. When someone curses you in *Kinyarwanda* that *Uragapfa utabyaye*, which is literally translated as 'May you die childless' (see also Uwineza and Pearson, 2009, p.11), it is the worst curse in life. To be cursed that you should not have children is to wish that your family and lineage should die and never be remembered. This idea further implies that your clan will be smaller in number and cannot stand firmly against the one with bigger numbers. As such, the community makes it an obligation for everyone to have children at a specific age. In other words, the community would applaud someone who has produced children out of wedlock but not someone who is married but is childless. In this regard, society expects young men and women who have attained puberty to have children as a means of ensuring the continuity of the community. More specifically, women who are older than twenty years are expected to bear children under whatever conditions. Those who go beyond thirty years without having any child are called *igumba* (the barren ones).

In the process of struggling to fulfil these societal expectations (as the discussion on marriage has also demonstrated), many young women cut short their career aspirations in order to have children. They drop the subjects they would have studied, especially science, and opt for arts and social sciences. In the end, more men than women study science courses, a scenario which could contribute to the process of defining science subjects as masculine. To illustrate this, let me draw on the case of Nelly. Nelly told me that she was so passionate about technology when she was a little girl and this made her work hard in science subjects in order to achieve her aim. Despite her parents allowing her to pursue sciences at university, some of the relatives and members of her community were not excited about her choice of study. They thought by embarking on a science programme at university, Nelly was going to spend a lot of time at school and fail to have children in the future. Below were her remarks:

Yes, especially in families, they can see you as a kid, and they see what you are doing. They start expecting you to be this and that and start telling you that you will not complete studies, you are wasting time and that in future you will not be a good person. You will not be available if you study science subjects. They used to say I am wasting my time. I cannot do anything good, but me I used not to listen to them. Well I listen but it just passes my ears. So, when they saw me join university, they got surprised. They said even you can manage to join KIST. It is all because they used to see me like someone who should study arts and leave the science thing alone because I was going to waste a lot of time at school, and not have children. When I finish university, I want a nice career in the sciences, then marriage and children will come later.

Similarly, Christine found it difficult to think about how she could reconcile her studies with having children. She told me that:

I don't think I can think about having children now. I think all this time I have spent in high school and now at university should be focused on studies. I am not pressured with what other people have to say about me. But also, my mum discourages me from that [getting married]. She usually says, look it's you and your little sister I am looking after and I don't want you to disappoint me. That if today she [her mum] happened not to be alive, it's me the one going to be responsible to look after my little sister. So, I have to work hard, finish my university studies and get a job. Then later I can think about that [children].

As can be inferred from the discussion and the quotations from Nelly and Christine's narratives, community expectations are crucial in influencing the gendering of science subjects at university. Members of their family and community had a negative perspective about their education. Despite them not bowing to pressure to abandon school, they were viewed as people who should opt for something that relates to the expectations of their community. As upcoming women, the community looked at them as people who should grow, get married, produce and nurture children to ensure the continuity of their community. Below, I discuss how the school becomes a platform for concretising gendered constructions of science subjects at university.

6.3 School as a Space for Gendering Science

In the previous sections, I have examined how families and communities become platforms for constructing the different genders in society. More so, I have demonstrated how these gendered constructions at family and community level enhance the choices of girls and boys to either study arts or science subjects when they join higher education. The questions that I attempt to answer in this section include: i) what is done/what takes place in the school? and

ii) how does the school act as a space for gendering science subjects? In other words, how does it encourage or discourage students to study science subjects?

Like family, the school acts as a socialising agent. The school provides an environment where many activities including classroom teaching and learning, games and sports as well as music, dance and drama (MDD) reinforce certain gender stereotypes such as women being physically weak to engage in sports – they are better off doing music, dance and drama. As Brush has also pointed out, another stereotype about women is presenting them as “inferior to men in the cognitive abilities needed for success in science” (1991, p. 40). All these may have directly or indirectly encouraged women to make certain choices on the nature of subjects they study at university. The following quotation from Delamont is significant in facilitating an understanding of how the school works as a socialising agent, which eventually influences choices by students on the nature of subjects to study. Delamont writes that “schools are important agents of socialisation; they are said to be powerful sources for improvement and those who wish to change society [...] – hope to use education to train girls for better jobs, [...] and generally reduce sexism in society” (1980, p.3). The school thus becomes a space where the abovementioned stereotypes are enforced thereby affecting the nature of subjects boys or girls choose to study at university. In her article “choosing the margin as a space of radical openness”, bell hooks, a renowned feminist scholar defines space as a “site of deprivation [...] It is also the site of radical possibility, a space of resistance” (1989, p.20). Her views are informed by her identity as an African - American, a people whose history is associated with marginalisation. hooks argues that one may not abandon this kind of space but one “stays in, clings to [it] because it nourishes one’s capacity to resist” (1989, p. 20). hooks’ ideas are significant in understanding the school as a space where students play out their constructed gendered roles. The school encourages some students as it discourages others through the confirmation of gender roles by fellow students and teachers, teaching and assessing students or undertaking the intellectual challenge to study their subjects of choice. In this section, I discuss how enrolment at school (from primary through secondary school to university) contributes to gendering subjects especially sciences, presenting them as subjects likely to be studied by young men.

6.3.1 Enrolment at School: From Primary to Secondary

That parent's play a crucial role in influencing children to choose either sciences or arts subjects in future when they enrol at school is demonstrated through the roles children tend to be given in the family. In the previous sections I discussed that, from the tendency for girls to have more nurturing and caring roles that are more traditionally associated with 'housewives', daughters, or mothers they are implicitly encouraged to pursue university subjects that may be complementary to these roles. Such subjects include home economics, beauty therapy, dressmaking, hairdressing, tailoring, religious studies, history and English. On the contrary, male children have very different roles in the family to those assigned to females and these include tasks such as felling trees, splitting firewood, cutting grass, and looking after cattle. These are more traditionally associated with the roles of fathers, sons, and heads of the family. Although parents are in a central position to influence children in choosing either to study sciences or arts and social sciences in the future, in a school setting - physical facilities, learning resources, school types, and teachers are also at the forefront in motivating students to choose which subjects to study. Here, I examine how the school becomes a site for gendering science subjects.

6.3.2 Starting Primary School

As mentioned in Chapter Three, in Rwanda, children in primary schools are clustered into two main sections, namely i) primary one to three; and ii) primary four to six. Pupils between primary one to three study English, science and elementary technology, mathematics, social and religious studies, Kinyarwanda, creative arts, music, fine art and crafts as well as physical education (PE). On the other hand, those in primary four to primary six enrol in all the above mentioned subjects, with French introduced in primary four.⁷³ Although teachers may play a role in influencing children to like particular subjects as the other subsections of this chapter demonstrate, there is generally no specific preference by pupils for specific subjects between primary one to primary three. Archer et al. (2010) note that the attaching of a particular

⁷³ At the end of the sixth year, children do a national examination, which marks a transition from primary school to secondary school. The subjects that are examinable at the end of this level include mathematics, science and elementary technology, social studies, English and Kinyarwanda. The highest mark a pupil obtains after doing these national exams is 5 aggregates, which comes up after obtaining distinction 1 in each of the subjects. On the other hand, the lowest mark that a pupil gets is 45 aggregates. Someone is considered to have failed a subject if s/he obtains an F, which is equivalent to aggregate 9. Failing all the five subjects implies that someone has got 45 aggregates.

gender identity onto specific subjects usually starts at primary four, at around ten years of age. Gendering subjects emerges as children get older, to begin categorising science and mathematics as masculine and English, Kinyarwanda and social and religious studies as feminine subjects. Pupils begin cultivating their interests right at primary school level on which subjects they need to study later in life. During fieldwork, the above constructions came to the fore through the narratives of my participants. In this regard, Brenda, a student of estate management and evaluation told me that:

One of the things that motivated me to take science subjects is from the start in primary school. For my primary school, I studied in Tanzania. I used to like mathematics so much. I used to like studying it more than any school work.

Similarly, Claudine's views show that pupils prefer subjects which do not prove very hard; they are most likely to choose those which appear simple. To this, Claudine, a student of biology had this to say:

English was difficult for me. I liked subjects where you can read through and understand, that is why I liked maths and science, and it was a lot less effort to learn them. There was really not much writing in science and math.

Being a socialising agent, teachers have had a profound impact on the learning journey of their pupils (Sadker et al., 2014). Not only are teachers most likely to reinforce the gender roles of society by asking boys and girls to study subjects related to the expected social roles of men and women, they also encourage those pupils who have a preference for specific subjects to work hard and realise their dreams. Lastly, teachers play a role in helping pupils who are not sure of what they should study or the career they have to pursue in the future. While the latter two issues were not evident in the girl's accounts, they will be discussed under the section of secondary school transition. Below, I present again the case of Brenda whose choice of career was influenced by the teacher while in primary school. Brenda told me that:

I really do not know why I liked [mathematics] but I remember the teacher who was teaching this subject did so well so I could find myself enjoying it. And my grades were good. The teachers played a big role in making me feel like it is where my career belongs and when one excelled in a particular subject, they motivated us. They would say, you can do this and also do better. So, I always had that backup of teachers.

In the next subsection, I discuss how the school environment at secondary level becomes a space for gendering science subjects. From the subjects studied, the nature of the school one attends to the role of teachers and fellow students, I demonstrate how the school participates in gendering science subjects at university.

6.3.3 Transition from Primary to Secondary School

These influences do not stop only at primary school, they continue even at secondary school level. Unlike at primary school where children spend six years, when they reach secondary school level they pass through two levels – lower and upper secondary. For three years, students in lower secondary are taught English, Literature in English, mathematics, history and citizenship, geography and environment, entrepreneurship, chemistry, physics, biology and health sciences, ICT, Kinyarwanda, Kiswahili, and French. These subjects are compulsory in all public schools since such schools are expected to fully respect the curriculum set by the Ministry of Education. This Ministry also has what are commonly known as elective subjects including music, dance and drama (MDD), religion and ethics, fine art and crafts, home sciences as well as agriculture and animal husbandry. However, some private schools, especially those which follow the international curriculum, do not teach all the above subjects.

As a level where students specialise, upper secondary offers a combination of three main subjects with general paper, communication skills and entrepreneurship cutting across these combinations: PCB (physics, chemistry and biology), MCB (maths, chemistry, and biology), MEG (mathematics, economics and geography), PEM (physics, economics and mathematics), BCG (biology, chemistry and geography), MPC (maths, physics and computer science), HEG (history, economics and geography), HGL (history, geography and literature), LEG (literature, economics and geography), HEL (history, economics and literature), EFK (English, French and Kinyarwanda), EKK (English, Kiswahili and Kinyarwanda) to mention some of these combinations.⁷⁴

As this study demonstrates, although it is not explicit at primary school level, at secondary school level, subjects taught as listed above are gendered. In other words, science and arts subjects are socially constructed as feminine or masculine. There is also a hierarchy in terms of whether the subject is science or arts and social sciences. In her work on gendered subjects and ability, Francis notes that the “dualistic allocation [of subjects] carries a hierarchy in terms of subject status, the sciences are associated with high status traits such as rationality and objectivity, while the arts are associated with emotion and subjectivity. It is the

⁷⁴ In their policy document on the Curriculum Framework in Rwanda, the Ministry of Education and Rwanda Education Board (2015) declare 17 subject combinations for sciences, arts and humanities as well as languages.

construction of these traits as gendered which leads to the assignment of these subjects as masculine or feminine” (2000, p.35). Science subjects like physics, chemistry, agriculture and mathematics are constructed as masculine subjects. This means that boys are more likely to be encouraged to excel in these subjects than girls. Conversely, subjects including arts and the humanities are seen as feminine (Francis, 2000) and young women are encouraged to excel in them more than their male counterparts. Referring to the issue of status as alluded to above, since sciences as opposed to art subjects are associated with higher status, it may be that men get higher social status by virtue of being constructed as those who are most likely to study science subjects. This observation is also shared by Mwingi in his work on science and technology education in Kenya. As Mwingi points out, “where sex [that is, male and female are] accorded oppressions and privileges, as in education [they will] experience [it] differently” (2008, p.100). He adds that “gendering disadvantages females more than it does males” (Ibid, p. 100). Indeed, the misconception that women are not intelligent enough to do as well as their male counterparts, including performing well in the sciences as articulated by scholars such as Brush (1991), Archer et al. (2012), and Bian et al. (2017), is problematic and has implications in discouraging young women from pursuing science-related careers. Science subjects are considered hard and therefore difficult and more important than arts and humanities. Hence, young women are most likely to study arts and social sciences, which are regarded as soft.

Lloyd and Duveen (1992) in their work on gender identities and education note that teachers are usually aware of sexism and how this contributes to gendering of subjects. As Lloyd and Duveen put it, teachers are expected to avoid sexist language or activities that can encourage or discourage members of a particular sex group from pursuing their desired goals. However, my study reveals a different story. Some of my research participants experienced a situation where teachers could discourage them from pursuing some science subjects. The case of Janet is a significant example for illustration. Janet revealed to me that while in the second year of secondary school, teachers constructed her as someone who should not excel in sciences because she was a girl. Janet said that:

I remember when I was in my second year of secondary school [form two], I got the highest mark in physics and the teacher said ‘How come the girl has the highest marks?’ It was a kind of a joke but somehow it affects you because it is like a girl should not succeed more than the boys [in science subjects].

Belinda was also of the same view and she told me that:

I've also recalled how teachers in my third year of secondary school responded to this, and most of them completely ignored me and the other girls. For example, my mathematics teacher almost always exclusively referred to the class as boys, imagine forgetting that there were girls also. We were about like fifteen girls in class. On the other hand, my chemistry teacher, who was a woman, was very helpful. I could walk into her office to ask for something, like a test paper and could be surprised when she calls out my name and then she tells me how I performed on the test. She was really very helpful.

This observation by Janet and Belinda not only brings to the fore the issue of sexism and the conventional essentialising discourse of gender in which men are seen as more intellectual, but also shows how teachers construct girls through feminising them. Writing about science and technology in Africa, Kitetu also notes that this attitude of regarding girls as less intelligent to study science subjects but need to study 'simple' subjects like arts and humanities has "serious implications for girls' advancement in science, if they are not pushed like the boys, they are likely to fall behind" (2008, p. 18).

Besides teachers being a motivational or discouraging factor in helping girls or boys to pursue careers in science subjects at secondary school level, the quality/type of schools attended also participates in this process. Are they assisted schools – those that are partly owned by the government and the church - private schools, or fully funded by the government? Is the school also mixed or single, a day school or a boarding one? Each of these categories of schools socialise children in unique ways and this impacts on the nature of the subjects students pick on at university.

In Chapter Three, I discussed how the church participated in the establishment of schools in Rwanda during the colonial period. The Catholic church, for example, introduced the first schools in the country during the early nineteenth century and these are the schools which offer some of the best education in the country even during this twenty-first century. Among other things, Obura (2003), in her work on the educational structure in Rwanda since the pre-colonial, colonial through independence to post-genocide period shows how children have defined what they regard as a good school. In relation to teachers, children emphasised the point as to whether teachers are qualified enough and have good relationships with students or not. Other issues include infrastructure (classrooms, adequate boarding facilities and cleanliness), performance at national examinations as well as entrance requirements. Schools which do not have the above facilities are defined as inefficient since they are not able to provide the required services. By exposing their students to the facilities enlisted above, good

schools enhance the process of exposing students to disciplines considered ‘hard’ especially science subjects. Christine, Brenda, and Janet were among those young women who attended elite catholic and government schools such as FAWE Girls’ School and Lycee de Kigali, as well as Maranyondo Girls’ School. Brenda had this to say:

I was at FAWE Girls’ School and I studied quite many subjects, like biology, chemistry, maths, and physics. So, when I enrolled for ‘A’ levels at the same school, I had to specialise in some subjects. I had some particular subjects I was excelling in – it was physics, chemistry and maths [...] I decided to take physics, chemistry and maths. And those were my principle subjects. The school was good in terms of having experienced teachers, who did not scold or beat us. We had laboratories, clean dormitories and all this favoured or contributed to my success at school. Remember as I have told you my parents also encouraged me in my studies as they bought me text books, mathematical sets, paid for my trips to attend science fairs and could also come to school to check on me. And really it is that passion of excelling in mathematics at primary and my ‘O’ levels that made me specialise in those subjects. I would say that one of the major things that contribute to one’s journey is where [the school] you have studied from.

Similarly, David, one of the lecturers in engineering I interviewed, attests to the fact that the secondary school one attended influences the nature of the subjects and career aspirations one tends to pick on. David said that:

Having a good background from secondary schools helps one to succeed in these science subjects [due to the nature of socialisation one gets from there].

In addition, Janet also raised her voice on the quality of teaching and learning she experienced while completing her ‘O’ level and ‘A’ level studies. Janet commented that:

From my own experience at Lycee de Kigali and FAWE Girls’ School, I watched my female best friends thrive through challenging maths and science classes. These schools had adequate learning spaces as the classes were not very over crowded, the teachers were motivated, they even mentored us on our career aspirations. We had laboratories to do practicals for biology and chemistry, even a computer room availed to us. Generally, in these two schools I attended, learning materials were in plenty and this helped me to concentrate on my studies. But before I joined them, I was studying in some rural school for my primary studies and then later joined a government funded school, which wasn’t very bad but the classes were overcrowded, teachers not coming on time and also the laboratories were not equipped with learning materials. My colleagues I left in that school told me they have nothing to do [like to afford to change schools] but to persevere on with studies.

From these observations by Brenda, Janet and David, it becomes explicit that issues of social class also have a great influence on the education of people and the schools they attend. Having gone to FAWE Girls’ and Lycee de Kigali, schools for relatively well-to-do people, Brenda and Janet were able to access better facilities including laboratories and libraries,

besides being taught by qualified and experienced teachers. Moreover, these facilities are also supplemented by what their parents, in the case of Brenda (the father being a veterinary doctor and a mother working as a nurse) and Janet (the uncle who supported her was a medical doctor) gave. They could easily get items like mathematical sets, reference books, just to mention a few of these items. This viewpoint is also raised by Archer et al. They write that “[children who come from] middle-class families have been associated with more interventionist and structural approaches [...] that aim to develop a range of skills, interests and capabilities within the child which in turn help foster success” (2010, p.10). Unlike, the middle-class, the lower-class families may have little or no interventionist approaches meant to supplement on the resources offered to their children at school.

Socialisation of students and the influence it has on the nature of subjects they choose for their future careers is also shaped by whether the school is single or mixed. Unlike single schools where boys or girls may inspire one another, the situation is quite different in mixed schools. In these kinds of schools, not only do teachers act as motivational or discouraging tools, but fellow students can also motivate or discourage their colleagues. And this scenario is likely to affect female students more than their male counterparts. Among the issues that incessantly came up relates to the issue of stereotyping subjects by boys and it is what girls found hard to affirm. Boys think girls are not prepared to put enough effort in such subjects as physics, mathematics and computer science. As such, girls are pushed to the periphery as boys go ahead to specialise in science subjects. This issue was also observed by Nelly, who argued that:

But again, some biases might be there like boys asking you if like these hard subjects, why you chose to come and study them. They think life for women should always be easy. You know I specialised in mathematics, computer science and biology for my ‘A’ level. Now in one of the computer classes, we had a syllabus on software designs and data management and the boys could not believe that I could follow on the same pace like them. They [the boys] think that they should work for us and I think that perception is still there. Actually, I have some friends I studied with who reached a time and opted for other subjects instead of doing sciences. This came about because of fear that boys could laugh at them if they do not pass.

Likewise, Belinda's experiences in high school testify to what Nelly experienced in her learning journey. Belinda told me that:

I would be lying if I said it's easy to study with boys. It was different for me in my 'A' levels. I noticed girls in my senior five class were less likely to sit in front of the class because of the intimidation from the boys. The ones who sat in front of the class were likely to be picked upon for answers by the teacher and if you failed to answer correctly you would be laughed at by the whole class and it is especially the boys who could laugh at us. Again, like the physics class, it would be boys asking many of the questions, and we girls feel like the odd ones out. We only just persisted but it was terrifying to study with them.

Nelly and Belinda are among the few girls who managed to work hard and follow their ambition. As they pointed out, for fear of being ridiculed by their male friends, other girls opted for arts subjects including English, history, and Literature just to mention a few of these subjects. While in mixed schools, when girls see themselves as being insecure due to criticisms from boys, they tend to work together thus creating what Sara, Scott and Spender would call "sisterhood" groups (1980, p. 63). This kind of solidarity becomes a space for girls to confront academic challenges, which they face while at school. Although this may seem to be a means for girls to work together and overcome the problems of academics like in single schools (Ibid), other girls would prefer to join boys' groups.

Some of the young women I interviewed saw girls' groups as a means of rumour mongering and platforms for 'nurturing' jealousy. Nelly and Janet told me that they do not like joining groups of fellow female students because they discuss "silly" things besides arguing a lot. Nelly said that:

Even though I have a chance to be friends with girls we usually argue over silly things and later fall out [...] then I think most people whom I interacted with were older people and these were normally men. That is why I find it convenient to study with boys.

Janet also had this to say:

So, you find the only thing girls do is talking, having conversations, which are nonstop, so they may say why do you have to read much. But when you are with boys, they are serious since most of them do not have time to date girls so they are deep in books. That is why you find that girls who are doing sciences are ever with them. You become friendly with them, you learn a lot from them and also, they learn from you. It is better than being with girls who are of no use. Well, a story can come like, 'Have you seen a girl who has just passed here?' And with all this, you end up not concentrating. So, it is better not to be so indulged with fellow girls so I am with boys most of the times.

That boys can separate themselves and work in their own groups thereby isolating girls is a common phenomenon in mixed schools. However, it was also revealed to me during the interviews that boys enjoyed working with girls thus encouraging them in the subjects they want to pursue at higher levels of education. The idea of boys allowing girls to join their groups is to enhance the learning process of the former. This means that girls in mixed schools can act as “catalysts” to reinforce the learning process of boys, which eventually concretises their hold on the science subjects at school. During my interaction with George as I conducted fieldwork, he told me that:

Studying with girls we feel we boys should know everything and if we do not know we feel ashamed in front of them. I do research and contribute to knowledge of the unknown. They have contributed more to my success and so we need the girls because they drive you to work harder (student in construction management).

The nature of the subjects boys or girls choose to study makes them inclined towards one another. In other words, if the subjects are what are constructed as feminine, girls will come together to create sisterhood associations to enhance revision and excel at school. It is the same with boys, who are mostly likely to come together and study the subjects of their choice. If the boys and girls happen to be studying the same subjects, they are likely to associate with one another and have discussions for study purposes. In the case of Nelly and Janet as shown above, there is little possibility that they will be inclined to follow girls, they are most likely to associate with boys since they study the same subjects. This is a socialisation which cannot happen in single sex schools.

6.4 University as Space for Concretising Gendered Constructions of Science

Based on the discussions in the previous sections, it becomes plausible that despite contemporary Rwanda adopting pre-primary education, the educational ladder in this country begins at primary school level. At about five years, children begin primary one and do the primary leaving examinations in primary six at 12 years. As I have already discussed, from primary school, children proceed to secondary schools, which are further divided into two levels: the lower level and upper level. At the end of upper secondary school, students sit for ‘A’ level national examinations that determine their progress to university or any other tertiary institution. Unlike at primary or secondary school level where the best performing student scores a distinction, the grading is quite different at ‘A’ level. The subjects are graded

from A to F, with A being the highest and F standing as a failure. Moreover, the letter grades have point values.⁷⁵

In this section, I discuss how the university becomes a site for concretising the gendered constructions of subjects studied by men and women. By training the young man to become an engineer, architect, medical doctor, technician, surveyor, statistician among other professions, the university offers a ground to re-affirm the social norms that men will most likely be prepared for roles that are outside the home, to become public figures. Likewise, when the young woman is trained to become a caterer, nurse or teacher the university acts as a space for categorising subjects including English, history or home sciences as feminine. But how do they achieve this? As this section shows, the university contributes to the gendering of subjects through admission policies, availing funding opportunities to young women and men at the university as well as through the way students are taught and assessed while pursuing their careers. First, let me demonstrate how this gendering is done through admission policies.

6.4.1 Admission Policies

In relation to the then Kigali Institute for Science and Technology, Silas Lwakabamba writes about the admission requirements to university and notes that,

The certificate of Rwanda National Examinations Board [RNED] which admits to the Institute provide[d] an overall assessment ranging from aggregate 11 to 2 for passing. Students on the upper reaches of the aggregate ladder [did] not only have first claim to university places but [had to] register first for the competitive disciplines. Often, however, an impressive overall score cover[ed] up for the weak subjects which [could have been] mathematics, chemistry, physics and engineering (2003, p.6).

Although Lwakabamba's observations provide an insight into how students are admitted into the university, the admission policy to university has changed since 2009. Unlike in the past when students seeking admission to Kigali Institute of Science and Technology (now College of Science and Technology, University of Rwanda) needed to have an aggregate between 2 and 11, students wanting to join university for science courses need to have obtained two principal passes totalling to 24 points (University of Rwanda, 2017). Those who want to

⁷⁵ A is the highest grade a student obtains at 'A' level. It has a point value of 6, followed by B, which has a value of 5. Others are C, D, E, S and F whose point values are 4,3,2,1 and 0 respectively. To join university, one must have passed 'A' level examinations and obtained an aggregate point required for the programme applied for. For further details see again the University of Rwanda admissions criteria at <http://ur.ac.rw/?q=content/call-applications-undergraduate-programmes-ur>.

study courses in arts and humanities, education and business studies, need to have scored two principal passes totalling to at least 18 points. On top of these, they need to have passed the general paper and have a certificate in English proficiency (See also REB, 2017).

Unlike in other neighbouring countries including Kenya, Tanzania and Uganda where affirmative action is extended to admission to university⁷⁶(with girls being given extra points while seeking admission into university), the Rwandan case is different. In Rwanda, admission into university is strictly on merit, based on the points one gets after sitting for the national examinations that come at the end of the upper secondary level. Extra points are only given to girls who progress from lower to upper secondary. In addition to the extra points given to girls seeking to do sciences at upper secondary, those who fail to make it to university during the first attempt at national examinations were given a chance through a special women's project under the Ministry of Education to re-sit the advanced secondary exams as a way of making them get points that can enable them to enter university. As David, a lecturer in engineering observed "this women's programme sensitised about the role of science and technology and allowed girls to apply for science and technology courses at the university". As pointed out above, students entering university to do science courses are expected to obtain two principal passes totalling to at least 24 points besides passing the general paper and having a certificate in English proficiency.

As noted in Chapter One, by the year 2016, more young men enrolled in the College of Science and Technology than women. My study has revealed that this state of affairs is due to a number of factors including the social roles young women are expected to perform at home as compared to men. I have already mentioned how some parents expect female children to perform certain roles at home despite such roles affecting their education journey. As my research participants told me, most of the girls are expected to fetch water, cook, wash clothes, clean the house, and take care of their young siblings. As they carry on with these roles, females tend to spend more time outside their academic work than their male counterparts. Another issue relates to the economic status of the parents. This study has revealed that parents from rural backgrounds usually depend on agriculture for their day-to-day survival. It is from this activity that they get money to pay school fees for their children unlike their counterparts from urban areas who diversify their income through salaried jobs

⁷⁶ See for example, Onsogo's work on affirmative action, gender equity and university admissions - Kenya, Uganda and Tanzania (2009).

and business. In cases where parents need to make a choice between taking a son or daughter to school, the former is preferred since the latter is looked at as someone who will grow up and get married.

Based on the above scenario, one would expect the university to relax its admission policies to favour girls, especially those opting for science courses. In spite of the GoR promoting gender equality in education, the university policies on admission tend to push women to the periphery. In this case, to set very high conditions for admission into science programmes at university is to prevent young women from accessing such programmes since they study under unfavourable socio-economic conditions as noted above. As a result, the university participates in constructing science subjects as a masculine domain because young men are the ones most likely to qualify for them.

6.4.2 Funding Opportunities for Boys and Girls

Nuwagaba (2013) in his article on higher education in Rwanda writes about how higher education has been funded since the period the country gained political independence in 1962. Nuwagaba notes that higher education in Rwanda can be traced from 1963, the period when the University of Rwanda was founded. Due to the few students who enrolled in university education at that time, funding was solely done by the government. As long as someone was eligible for university, both men and women were given funds for admission to university education. This trend went on until 1994 when the country was plunged into genocide. Being a practice that was orchestrated to exterminate a particular group of people (Hintjens, 1999; Hodgins, 1996; Obura, 2003), not only were university professors and students (particularly the Tutsis and moderate Hutus) killed, but the infrastructure was shattered. This period saw the university closed down with its operations resuming in 1995.

Because the previous regime had even made access to university education difficult for the Tutsis (with Hutus given the biggest slots at university), the post-genocide government made it possible for all Rwandans of different identities – from different ethnic backgrounds, regions and gender – to join the university. More so, since joining university was primarily based on merit, university students were given tuition (the scholarship from government) and living allowances (which were supposed to be repaid after securing employment). This type of funding was given to students till 2008. It was later replaced with cost sharing. Under this model, the government gave loans to university students in accordance with the nature of the

programme someone was studying at university. Initially when cost sharing was introduced, the government gave 75% for students who did sciences and 25% was raised by the students themselves. On the part of those studying arts and social sciences courses, the government gave as loans 50% of their tuition and students paid the remaining half. This type of funding shows how the government valued science courses at the expense of arts and social sciences. Because the students could not afford to clear their part, the government came in and gave full tuition and maintenance fees (also in the form of loans) for all students at the university.

In 2011, there was a change of policy to identify the potential beneficiaries to join university under government funding. Through the *Ubudehe* categorisations of the population as a way of classifying people in relation to their economic status as mentioned earlier, the government started giving loans to cater for university fees for students whose households fell within the first and second categories of *Ubudehe*. As a top up, students falling under these categories also got money for maintenance (25.000/= Rwandan Francs per month). Unlike students who fall under the above two categories, those students classified in the third and fourth category had the government cater for half of their fees at university and they also paid for the other half since their parents were considered to be on the “borderline of the poor and rich”, to use the words of Ezeanya (2015, p.13). Lastly, students classified under categories five and six paid for their full tuition fees because they had parents who were said to be financially well off.

It is important to note that although *Ubudehe* as a system was used to identify the six social classes, it was later revised in 2015 by the Ministry of Local Government into four social categories.⁷⁷ These new social classes are; i) people who have no houses, hardly earn and are not able to get much to eat; ii) people living on hard labour, are paid for completing temporary jobs and are capable of renting houses or can have houses of their own; iii) citizens who do not need government support, depend on their own incomes, they can sell excess produce (if they are farmers) and if they are in the private sector, they have what is described as ‘health’ businesses and; iv) leaders including directors in public institutions. As a technique to guide the government on programmes like healthcare, poverty alleviation,

⁷⁷ For more details, see article authored by Rwanda’s Ministry of Local Government (2015) entitled “Minister Kaboneka launches new *ubudehe* social categorisation” on the revised new social class categories of *Ubudehe* and when it came into effect. This document can be accessed at http://www.minaloc.gov.rw/index.php?id=469&tx_ttnews%5Btt_news%5D=402.

among others, the Ministry of Education have used this new *Ubudehe* classification to award scholarships since 2016. Students whose families fell within the first and second *Ubudehe* category had the chance of acquiring government scholarships including getting school fees and living allowances. On the other hand, those belonging to the third and fourth category had their parents cater for their fees and other university expenses. Although some students from poor families were able to benefit from scholarships to join university, Nelly expressed great concern about the application process by saying:

The process of applying for these scholarships basing on the *Ubudehe* categorisations is very complicated. You know during the time of the application process, applicants must come to the capital city, Kigali, and they have to come more than three times which is financially expensive especially for those from poor families. You know the authorities responsible for this exercise have to first verify the social class category of your family, and at times they verify such information by making such consultations with the local elders in our communities. So, this takes time, so I know some people have given up on university studies because they cannot afford to travel to Kigali to follow up on their application.

Nelly also observed that the existing provisions on funding based on an individual's social class are not enough, and needs to be revised and implemented effectively in the real-life situation. She noted that:

Education is free up to secondary level. At university level it isn't free for everyone. One has to really work hard and attain good grades. But now not only good grades make you qualify for government funding but also one's family social class is now very much considered. Like me actually I was going to miss on the scholarship because the authorities were saying I come from a middle-class family, and that I can afford to pay for my tuition. I told them it isn't true. I told them that my family cannot afford the tuition fees and if I don't get the funding, I will miss out on my dream of becoming who I wanted to be in the future [an engineer]. So, I think some students lost out like that on scholarships because they were wrongly placed.

Further still, the funds also provided in the academic year 2016 to 2017 for the students were dictated by the jobs in the labour market in the country. What are the government's development visions? How are these visions supposed to be realised? These were the issues that also guided the government to provide funds to students joining university beginning the academic year 2014 to 2015. Due to the idea that science is at the centre of national development, not only were most of the slots at university allocated to science students, but also the available funds were allocated to people studying sciences at university.

The money given to students joining university in Rwanda is paid in terms of loans, not mere grants. Initially, this money was regulated by the Students' Financing Agency of Rwanda

(SFAR), but between 2013 and 2014, the Rwanda Education Board (REB), under the Department of Higher Education Students Loan (DHESL)⁷⁸, was responsible for the selection of the beneficiaries of the students' loan. However, by October 2015, the REB only did the selection and the funds were paid to the beneficiaries by the Development Bank of Rwanda (BRD) due to its ability in the disbursement and recovery of the loans (see REB, 2017). Besides the loans students get from the government as outlined above, there are also parents who pay tuition fees for their children regardless of the income levels of their household. Furthermore, there are also students who fail to get government scholarship or may be admitted under the government scholarship but may not like the courses given to them. Such students pay for themselves provided they qualify for the course they want to enrol in. Moreover, students who were directly affected by the genocide are paid for by the genocide survivors fund known as FARG⁷⁹, an NGO working to support survivors of the genocide in Rwanda in terms of education, shelter, health and other basic needs. Not only are the above organisations catering for students at university, but there are churches and other parastatals that pay the fees of numerous students at university in Rwanda.

Although these loans may look to target the poor people especially those from rural backgrounds, they tend to foster class differences between the poor and the rich. While the rich may have understood and participated in the business of loans, the poor tend not to accept loans as a way of life. One of the reasons for such fear relates to the uncertainty to pay back what is given. This idea is also discussed by Husbands in her article on women's place in higher education in the United States. Husbands writes that "[...] parents may not be anxious to go into debt for the education of a daughter whose earning future they see as uncertain" (1972, p.262). Similarly, in a study on girls and women's education in Kenya, Chenge and Sifuna point to the strong belief that "once married, girls become part of another family and the family investment is lost" (2006, p.40). It was this very issue that was raised during my interview with Peter, a parent whose daughter had become a medical doctor. According to Peter:

⁷⁸ Rwanda Education Board (REB) is an institution under the Ministry of Education. As an institution, it boasts six departments – curriculum and pedagogical materials, examination and accreditation, ICT in Education and open distance and e-learning. The last department under REB is teacher educational management and professionalism.

⁷⁹ For a more detailed description of FARG, see the Government of Rwanda at www.farg.gov.rw.

When government changed its funding procedures for university education, many young people lost out on their future dreams. The inclusion of one's social class among other factors like grades affected many students and parents could not fund their children's university education. And if a family had more than two children going to university, it was more likely to pay for one child's tuition. Nowadays even, the scholarships given are not grants but loans to be repaid back. So, I have also seen some of these families fearing to pay back the loans. They say, ahh after all my daughters will get married. Like my daughter who is a medical doctor is married now. She is lucky that she attained university education. But I am not happy because we have lost our physical energy looking after her, lost money to another family. It is a loss to me, my wife and her siblings because everything she will do, will not belong to us, it will belong to another family. That's why we say in our family that spending money on a girl is a loss. In our village, when girl's complete senior six, they leave them, cannot spend a lot of money on them because as a family they will not gain anything from them. When she is gone, she is gone, you cannot count on her any more. And her husband will force her to work for his family and not the family where my daughter is from. It is as if we produced for other families.

Furthermore, if such parents have many children, they need to seek loans for, there is a likelihood that some of the children may miss school because of the limited financial resources in a home. More so, the idea of giving priority to science programmes where the government provides loans to the tune of 70% means that those who did not have a chance to attend good schools will not benefit from such a scheme. Under the section of socio-economic background of students, it has been argued that the social factors like family background affect girls more than the boys. By giving priority to sciences without addressing these socio-economic influences, the university continues to become a space for young men to access the science subjects at the expense of women. In the next subsection, I discuss how the teaching and assessing of students contributes to the gendering process.

6.4.3 From Teaching to Assessing Students

In the discussion on primary and secondary school, it was noted that the attitude of teachers plays a crucial role towards the gendering of science subjects at this level of education. By encouraging students to excel in particular subjects, teachers either directly or indirectly encourage such students to pursue careers related to such disciplines in the future. Likewise, if teachers complain that particular genders are not expected to excel in certain subjects, they discourage students from learning such subjects which also puts them off from pursuing careers in that line. My research has demonstrated that the university re-affirms this situation through the attitude of lecturers towards certain genders.

To this end, young women are constructed as people who cannot have time to concentrate on such subjects like mathematics, physics and engineering. During our interview with Paul, a lecturer of mathematics at the College of Science and Technology he re-affirmed this issue when he told me that:

Women's life is demanding. They need to take good care of their hair [...] need to really look beautiful. I see most of their time spent on looks and clothes. And if that is the case there is no way they can concentrate on studies.

The feeling, as this lecturer continued to say, was that women need to study less demanding subjects⁸⁰ in order to catch up with their feminine demands. As Paul added:

Many women are into biology here at the university because it is not so demanding. It is not like maths where by all the time you have to be reading books. With biology they can get time to maintain their appearance. That's what I think.

Belinda also commented that:

As a young woman studying a scientific field, it's something I've experienced before. You know lecturers or our male colleagues think we spend most of our time trying to look good. They wonder how we came into the science domain. Well I always worked hard to get good grades and prove the boys wrong.

Likewise, evidence from the interactions I had with male participants during my MRes study revealed patriarchal influences on women's experiences in science, which adds weight to physicist Evelyn Fox Keller's accounts of her experience as a student studying mathematics. In this regard, Keller notes that not only did her male counterparts avoid her but a male university teacher did not believe that she could solve mathematical problems without the help of her male colleagues (cited in Rose, 2004, p.76). Keller's story illustrates how gendered it can be to study science, especially in higher institutions of learning. According to Rose (2004), such a scenario calls for women to suppress a part of their selves in order to acquire professional credibility.

My own experiences also testify to what Belinda experienced in her learning journey. Though I did not study sciences as in the case of Belinda, I remember that, as an undergraduate student, I worked hard at university and was among the best in class. Despite this, the male students were quick to question my ability to perform better than them, just because I was female.

⁸⁰ However when I interacted with several female students, it was revealed to me that biology is among the demanding science subjects. One has to engage in a lot of practicals besides the theories that come with this subject.

Although the feeling is that certain courses are likely to be studied by women while others by men this has been disputed by several research participants. The following excerpt is part of the conversation I had with David, lecturer in the school of engineering:

It is a mentality [...] I think this tendency that science is not attracting women where they believe these other courses are masculine [...] saying that they are for men rather than women is wrong because engineering as a degree programme avails different skills and occupations for both girls and boys. The positions they take on in the labour market may be different but at the end of the day, I do not see any profession where women cannot perform well like men. Rwanda is having a policy now of trying to sensitise young women to join the engineering department.

The above views by lecturers such as Paul show the different attitudes people have towards students (especially female students) and the pursuance of specific careers in life. Generally, even at university level where one would expect lecturers to encourage students to excel in subjects of their choice, they instead continue the socially rooted constructions of women as people who need to take care of their bodies at the expense of spending time practising subjects like mathematics. Here, we see women being the subjects of the male gaze even in university settings.

6.5 Conclusion

In this chapter, I have discussed the gendering of science subjects at university in Rwanda. I have shown how family background, community expectations and the school have contributed to the gendering of these subjects at university in Rwanda. Apart from demonstrating how the kind of roles girls and boys are expected to perform in society influence the subjects boys and girls choose while at school, I have discussed how the school and particularly the university becomes a space for encouraging or discouraging particular genders in pursuing specific careers in life. Particularly, the chapter demonstrates how teachers at the different levels of education in Rwanda are instrumental in constructing subjects like physics and mathematics as masculine and English, history and home sciences as feminine.

As such, the chapter concludes that the nature of the subjects young women choose at all levels of education are influenced by deeply rooted socio – cultural and economic factors. In other words, the roles young women are expected to perform in society in most cases determine the subject they choose later at university. By doing so, young women want to

develop careers which resonate with society's expectations. This idea points to university as one of the significant platforms through which gender stereotypes are concretised.

Lastly, the chapter reveals that the admission policies are also responsible for gendering subjects at university in Rwanda. Although there is private sponsorship, those students who get government scholarships are taken on merit much as the social class of the student is put under consideration. One is admitted after achieving the required points after doing the national examinations at the end of the upper secondary level. To this end, we see university policies on admission as a mechanism that pushes women to the periphery since science programmes are among the subjects that require one to have scored highly in the national exams. Most young women as discussed in this research, study under unfavourable socio-economic conditions thus cannot compete with boys favourably.

Chapter Seven

Women ‘Scientists’ at University: Challenging Gendered Constructions in Rwanda

7.1 Introduction

In this chapter, I discuss how female scientists challenge the socio-economic and cultural constructions of society to pursue careers in science at university in Rwanda. Based on the discussions in the previous chapters (particularly Chapters Three and Six), the questions that I attempt to answer in this chapter include: i) How do the young women ‘scientists’ subvert femininity through pursuing careers in science at university? In other words, how do they encroach on men’s space as they study courses in science? ii) How do young women use science courses as a platform to underscore the question of career development instead of getting married and establishing families? and iii) What is the role of the government in ensuring that girls also study science courses at university, thus providing a bridge for young women to circumnavigate the socio-cultural and economic barriers towards the pursuance of their careers in these areas?

In order to answer these questions, I have organised this chapter into three sections. Section One deals with the question of the subversion of femininity by young women through studying sciences at university. In the second section, I address the question of how young women use science courses as a platform to underscore the idea of advancing their careers, thereby challenging the notion that their priority when they grow up should be to get married and start their own families. The last section is a discussion on how the government has participated in ensuring that young women also get opportunities to study science subjects at tertiary institutions including universities. By insisting that women should also be given a chance to study science subjects, particularly at tertiary level, the government helps these young women to negotiate or overcome the socio-cultural and economic issues that construct them as individuals who are supposed to study arts and humanities (as discussed in Chapter Six). My discussion in the following section begins with how young women studying courses in science at university subvert femininity. As is the case in Chapter Six, the discussion in this section is based on the narratives of the young women I interviewed during fieldwork.

7.2 Science as Subversion of Femininity

In Chapter Six, I discussed how subjects including English, home sciences and history are constructed as feminine at school level. Because women in the Rwandan society are sometimes constructed as intellectually weak, they are likely to study subjects that do not require a lot of thinking or calculations (Uworwabayeho et al., 2007). On the other hand, subjects including physics, chemistry and mathematics, or what Masanja (2010, p.1) regards as ‘hard sciences’, are defined as masculine. These subjects have calculations, in addition to involving practical work that may demand that the student mixes colours to create certain solutions or draw and plot graphs as a way of proving certain principles and formulas. Archer et al. (2010) point to these issues in their work on schoolchildren’s construction of science, noting that science involves “hands on elements of practicals and experiments [...due to this, students construct] science as very dangerous [for girls] and very exciting [for boys]” (p.5). These are the attitudes that could have motivated society to consider the above subjects as masculine, besides parents and fellow students reinforcing these categorisations. I have also demonstrated how teachers play a crucial role in designating certain subjects as masculine while constructing others as feminine. The question that comes into mind is: what does it mean for women to leave ‘their’ designated subjects and study subjects that are constructed as masculine? In this section, I argue that by studying subjects such as engineering, construction management as well as estate management and evaluation at university, these young women could be seen as encroaching on men’s space. It could also be prudent to argue that science subjects are a platform for these young women to subvert feminine roles in society. In this way, we see young women attaining a stage in life where they determine their own future by embarking on careers of their own, as opposed to following the path society constructs them.

As pointed out in the discussions on family background, femininity and masculinity denote attributes and behaviours seen within societies as appropriate for females and males (Stanley and Wise, 1993). As feminist scholars, Stanley and Wise argue that, ‘all children are assigned a gender, which is based on the appearance of their genitals’ at the time they are born (1983, p. 87).⁸¹The gendering process goes on through naming ceremonies, which Delamont (1980) in her work on sex roles, likens to a period when children are ‘forced into a classification

⁸¹ See also Nancy Chodorow (1978) who points out that when babies are born, they have to learn what it means to be male or female through socialisation.

system' to give them a gender label (p.12). Not only is the allocation of domestic chores by parents and initiation of boys into manhood or girls into womanhood at adolescence that continues the process of gendering boys and girls, the nature of the clothes that boys or girls are dressed in also continues the gender labelling (see, for example, Delamont, 1980; Ruble et.al., 2007). In relation to the construction of feminine roles and traits in Rwanda, my experience of growing up as a girl shows that upon reaching about ten years of age, female children are given tasks including washing dishes, helping the mother peel bananas and cooking.

In addition, as also noted in Chapter Six, girls are socialised at school to study arts and social science subjects, such as – languages, home economics and history. These subjects become a platform for society to turn young women into people who are supposed to uphold the roles of women in society. Bearing in mind the above constructions of the subjects for men and women by the different stakeholders, it is not unreasonable to suggest that young women who decide to study science at university are in effect subverting or going against the societal expectations for a woman. These women could be regarded as people who are struggling to go against their feminine identities. What motivates them to shift their focus and strive to study science? I will return to this question later. One factor that motivates young women to see themselves as people who can do what men do is the changed perception about women since the aftermath of the genocide in Rwanda. After the 1994 genocide, the RPF government embarked on a comprehensive reconstruction programme for the country. There was infrastructural development (construction of roads, bridges, schools and hospitals) and there were concerted efforts to ensure that all categories of people were involved in the reconstruction process. Not only did politicians, civil society, the military and the police – among other stakeholders – come on board, the government also adopted policies that brought women to the fore.⁸² By 2003, Rwanda had elected more than 48.8% women to its lower house of parliament, which was considered the highest percentage of women parliamentarians in the world (see Devlin and Elgie, 2008; Debusscher and Ansoms, 2013). Related to the issue of parliamentary representation is the composition of cabinet, which also

⁸² In Chapter 3, I discussed the numerous policies, especially those that deal with the education sector, and how they have enabled women to have access to services in the country. Section 7.4 of this chapter also deals with government policies and how they have enabled young women enrol in science courses at universities in Rwanda.

boasts of women ministers.⁸³ Moreover, the government has also played a crucial role in encouraging women to become managers of corporate organisations like the Mobile Telephone Network (MTN), Rwanda Governance Board (RGB) and Rwanda Development Board (RDB). Even in banks, women have stood out as citizens that can bring Rwanda to glory (Uwineza and Pearson, 2009). Because of the above positions, the cultural perceptions about women in Rwanda have also changed. As Burnet has also observed,

the material realities of life in post-genocide Rwanda, and the greater representation of women in public life and political office have promoted a great deal of change in cultural and social conception of gender roles. With these changes has come a greater acceptance of women in positions of authority and of women as independent agents in the public sphere (Burnet, 2008, p. 386; see also Burnet, 2011,2012).

As noted above, such perceptions have motivated numerous young women at university in Rwanda to change attitudes about their constructions and identity. As this section will later demonstrate, young women see themselves as people who can do anything men can do. This study reveals how these young women have begun seeing subjects that have traditionally been constructed as masculine as subjects that they can also study. My interaction with Belinda, Brenda, Christine, Claudine, Nelly, Janet and Judith, demonstrated to me that young female scientists have rejected the societal stereotypes that portray them as inferior and less intelligent. They have constructed an alternative identity, which projects them as people who can decide and do what they feel is important for their own future. By deciding to pursue careers in sciences, which are areas traditionally associated with men, young women at university project themselves as people who can take on the roles set aside for men. To understand how these young women have gone against these societal stereotypes, there is need to discuss the notion of identity. Discussion of identity and its fluid nature form a framework through which to understand how the identities of young women have impacted on their ability to move from primary to secondary school and to university to pursue careers in science.

The idea of identity as used in this study is borrowed from Erikson's works including *Childhood and Society* (1950) as well as *Identity, Youth and Crisis* (1968). Erikson was a German psychologist whose area of specialisation was developmental psychology and psychoanalysis. He 'used the concept of identity to explain the influence of nature and culture

⁸³ At present, 13 of the 26 government cabinet ministers are women. See <http://gov.rw/government/cabinet/>.

on the development of personality and inner reality' (Lloyd and Duveen,1992, p.28). The main theme that crosscuts through Erikson's work is the idea that an individual undergoes eight (8) stages of development over his/her entire life, that is, from birth to death. These stages include: i) trust versus mistrust (which occurs between the day of birth up to one year of age); ii) autonomy versus shame and doubt (a stage which comes between the age group of two to three years old); and iii) initiative versus guilt (a stage between the ages of three and five years). Other stages include industry (competence) versus inferiority (between six and twelve years old), identity versus role confusion (thirteen and eighteen years old), intimacy versus isolation (usually seen in young adults), generativity versus stagnation (a stage that defines middle adulthood), and ego integrity versus despair (old age).

As Erikson puts it, all these stages have a significant impact on an individual, affecting him/her either positively or negatively. As an individual develops, failure to achieve each of these stages leads to a feeling of guilt or uselessness. Moreover, some of the things that happen in these stages occur unconsciously, although in some cases the individual becomes aware of the choices, she/he makes. Since our focus is the young women who have joined university to pursue careers in science, it is pertinent to discuss the fifth stage, which relates to identity versus role confusion, a stage that affects people between the age group of thirteen and eighteen years. The stage 'identity versus role confusion' mainly pertains to adolescence. Adolescence is a stage between childhood and adulthood, occurring between thirteen and eighteen years of age. Lloyd and Duveen (1992, p.29) point out that due to its pivotal position between childhood and adulthood, 'it is in adolescence that issues of identity are seen as salient'. In other words, as adolescents are people who are transitioning from childhood to adulthood, they are always curious about what the world holds for them in the future. As such, they preoccupy themselves with striving to create an identity that fits in their future aspirations. In his book entitled *Identity, Youth and Crisis* (1968), Erikson states that an adolescent usually asks her/himself several questions to establish what s/he is vis-à-vis what society constructs her/him to be. Such questions may include: 'Who am I?', 'What should my future be like?', 'What role should I take on?', 'Does such a role fit in what society expects of people like me?', and finally, 'To which social class do I belong?' and 'Does my anticipated role fit within the social class I belong to?'. These questions relate to Erikson's argument that identity is realised when a child is introduced to a larger community. Based on the previous role models, the child may abandon the childhood identifications and forms his/her 'own'

identity. What results from one's personal identity is a combination of social and individual values, which bring to the fore social and individual identities. Since adolescence is associated with discovering the self, an adolescent who fails to get a 'proper' identity for his or her life (future) suffers from what Erikson (1968, p.518) in his book, *Identity, Youth and Crisis* calls an 'identity crisis' or 'role confusion'.

In relation to this study, role confusion denotes failure to choose the right career for one's future. Because of the ambition to think about the future and what it holds for them, adolescence, according to Erikson, is a very problematic stage. Young people become more concerned about what they appear to be in the eyes of others as opposed to what they feel they are. In this case, the social and the individual interact, making it possible for someone to strike a balance between them – whether to follow what the society constructs her/him to be or to follow one's own instinct. Regarding this, Erikson writes that,

In a social setting and communal life, role confusion is almost synonymous with identity confusion as identity to a certain extent, is in alignment with the society and its expectations from the individual. However, identity confusion – is not all together a detrimental force. It is one of the elements of the psychosocial crisis and consequently, a certain portion of it is necessary. The adolescent has to find a balance between identity confusion and identity so as to reach a virtual of fidelity to society (Erikson, 1950, p.262).

The above ideas on identity are pertinent in my understanding of how young women define themselves in relation to social dictates. Specifically, by drawing on Erikson's idea of role confusion/identity crisis and how an individual strikes a balance between them, I demonstrate how young female scientists poise between what they want to be and what society wants them to be. In other words, what identity do they create for themselves considering the nature of the career they want to build for the future? I take Archer et al.'s (2010, p.3) viewpoints to define identity as 'both embodied and performed constructions that are both produced agentically by individuals and shaped by their specific structural location'. In this line of thought, Goffman's (2012) views are also pertinent. His views as expressed in his work entitled *Presentation of Self in Everyday Life* bring to the fore the idea of impression management. Impression management deals with taking on a role and performing it in such a way that society appreciates what you are doing and eventually approves that particular role so that you are approved as a member of that specific social setting. Highlighting on these viewpoints, Goffman writes that,

When an individual plays a part he[*she*] implicitly requests his observers to take seriously the impression that is fostered before them. They are asked to believe that the character they are actually possesses the attributes he appears to possess, that the task he performs will have the consequences that are implicitly claimed for it, and that in general matters are what they appear to be (Goffman, 2012, p. 46).

From the above quotation, it becomes clear that sustaining a false impression causes strain. This adds to our discussion on identity crisis, which is used to explain a situation during adolescence when a young man/woman fails to understand what she/he is and wants to study in relation to the educational trajectory. In relation to the present study, these ideas are significant, as they facilitate an understanding of how the young female scientists have sustained the impression of who they are and what they want to be in relation to what society expects from them. In other words, the insights from the above scholars enhance discussions on the question of agency and structural influences – the latter encompassing schools, community and family – and how the individual negotiates between them. To bring out the impression that they can also do what men also do, the young women discussed in the following paragraphs have devised means to demonstrate that they are able to study sciences just like their male counterparts through four approaches identified by scholars such as Busato et al. (2000, p.1058) as, i) ‘intellectual ability; ii) learning style; iii) personality; and iv) motivation and achievement’. I discuss these factors with reference to the voices of ‘participants’ below. Let me begin with the case of Brenda.

Brenda, a student in estate management and evaluation, was in third year when I conducted this study. Her journey to pursue a science course, a career that her society could not approve of, was influenced by the factors enumerated above. Brenda’s personality is what one would describe as full of determination, perseverance and resilience. She is confident and believes that she needs to be just as hardworking as her fellow male colleagues to achieve her dream of becoming a scientist. To desist from the view that women are emotional and physically weak, Brenda looks at nurturing, which is one’s upbringing by one’s parents, as the foundation for one’s success or failure in pursuing a science degree course.

Besides the personality attribute as articulated above, there is also the attribute of motivation so as to achieve what she needed to become. Looking at Brenda, it is quite easy to say she was interested in sciences, with the interest spanning over a period of time since primary level. Moreover, it is important to point out that this motivation thrived through the learning environment Brenda encountered, especially at FAWE Girls’ School, which is among the top

best schools in Rwanda. The nature of her programme at university underscored classroom teaching, internship training and fieldwork, activities, which further motivated Brenda at the university. Finally, her approach to learning involved devoting more time to her studies, as she could sit and revise her books, engage in consultations (with both fellow students – those still at university and friends who had already completed their studies in the same programme), and engage with others in discussion groups. To desist from the stereotypes about women in her society, Brenda rejects the idea that women are weak and cannot manage to study science subjects. She considers women in the same way she defines men. As Brenda put it, she has never been concerned herself about studying in a male-dominated environment. She resists any suggestion that her gender makes any difference to her student experiences at the university. She thinks those people who view men in ‘high’ esteem just have a mindset that makes them look at men and women differently. In her own voice:

I did follow the science path because I was aspiring to be either an electronic engineer, or a telecommunication engineer. When I was done with my senior six, I got a government scholarship to study here at KIST. But when I reached the university, I did not pursue engineering. I deviated a bit but still in the line of science and that was architecture. My performance is very good at the university and I have never repeated any level. One thing is that I knew what I wanted. One of the things is that I am committed and determined and I will always do something I am interested in. The lecturers are doing a great job. They help us with particular courses we choose, give us books to read. They also link us to other people during fieldwork study, like people who are doing particular jobs, to get to know how well the job is done in my field of study. We also have internships where I apply what I have learnt at school. But at times, you find that there are certain particular courses that are really hard, and you find that a lecturer comes and only makes a power point presentation. Then, as a student, if you have not mapped out the challenges you are going to meet ahead, you can easily fail the examinations. So, what I do, I always get time to sit down and revise books. I also consult some people who have studied architecture. I do ask them some questions, like their experiences, how well they performed in Year 1, and 2, and what it will take for me to excel like them. So that experience helps me to map out the challenges ahead and the opportunities [...] on how to handle myself towards achieving my goal. And I do not think being a woman is a problem or [it is something] challenging to me. It all goes with the mindset. When you really want something, you go for it. And I do not think it is a limitation for women, it is about being passionate about what you are doing.

The above excerpt highlights some of the factors that contribute to the academic achievement of someone despite societal views about the constructed roles of men and women. The second case I would like to present here is Claudine. Although she came from what one would define as a family with traumatic experiences, Claudine’s motivation to study and pursue a career in science can be traced to her family background. Unlike Brenda, Claudine

was born into a poor family. Moreover, the father deserted the family and went on to marry another woman. The mother was sickly and could not look after the children. Instead, she went to her own mother, who had to take care of her. Claudine and her siblings were left to fend for themselves. It was a home headed by children who had to look for their own food, clothing, school fees and medication.⁸⁴ To say that Claudine had luck considering the above circumstances is to emphasise the deplorable conditions in which she lived. However, she struggled against all the odds and went to school. Coupled with the motivation of the love for education, people in the neighbourhood were also an inspiration to her. As she told me, she could see how her neighbour, a teacher, was leading a ‘good’ life. This made her motivated to study so that she could get out of poverty and lead a better life. Furthermore, although Claudine was interested in helping people in need in the future, her decision to study biology was influenced by her competence to handle the subject successfully. Like Brenda, she was intelligent despite having problems with language because of attending poor schools while in primary and secondary. She was not good in English, the main language of instruction at university. However, she told me that her English improved a great deal at university by making friends and discussing with them whenever there was a need. All these attributes were significant in influencing Claudine to pursue her dreams of studying science at university, subverting what her society had constructed her to be. It is important to capture these views through her own voice:

⁸⁴ When Claudine also disclosed to me that she was married with children, I was surprised because most of the young women I had spoken to sounded negative about the aspect of combining marriage and studies. However, Claudine told me later that marriage became a strategy for helping her to ‘focus’ on her studies. Although the situation of studying as a mother brings with it challenges of providing for the children, this seemed to be advantageous for Claudine. She told me that becoming a mother was very important to her as it gave her a sense of identity. Not only was she provided with food, accommodation and other necessities of life (part of which she could also give to her young siblings), her husband gave her love and comfort, things that she lacked in her childhood. To her, marriage became an ‘address’ through which she got the necessary support to be able to study at the College of Science and Technology, University of Rwanda.

As I told you before, my mother was with my father and staying together. After a period of time, my father married another woman. Mummy remained there for us, the children, but at times when she fell sick, she would go to stay at her parents' home. I and my siblings then stayed alone at home and looked after ourselves. We then encountered many problems, including a lack of school fees, exercise books, and food we wished to eat. My young siblings dropped out of school, but me, I remained in school. It was like a miracle that only those who believe in God can understand how I went to school. I went through a lot of difficult times and faced lots of challenges. But I got courage and finished senior three and senior six successfully and later joined KIST. Before joining KIST, I was staying in a rural place, but there was a gentleman, who was teacher, and whenever I would see him, he looked different from other people. Yeah, there is a way he was different from other people in my village. It is him actually who motivated me to study and felt like I want to be like him, maybe again I thought that if I continued with school, it would be at least beneficial to me in the long run. But one thing I wanted was to be a medical doctor or a nurse. One thing that has helped me to succeed at school is group discussions. I think I told you how I did not get a chance to study languages so well during my primary and secondary school years, so my English and French are not good. English is now used as the language of instruction. My understanding of the subject when alone is therefore limited compared to when I study in groups. But I often have to get extra time for myself to be able to understand the complicated concepts used in the study of biology. And studying with boys is never a problem for me. I never considered things of construction, chopping or cutting firewood as roles for boys. I could also do that. Likewise, I do not consider sciences an activity exclusively meant for the boys. That is how I am [...]. My grades were good in class and at times, I used to perform better than the boys and that showed me that anything is possible. So, it is the people who have a different perception about what men and women should study and that is not true.

Another case whose story is related to the theme of subversion of femininity is Janet. As I pointed out in Chapter Six, Janet lost her father before completing school. Although she had lived in Uganda and had her initial education there, she came to Kigali (Rwanda) and was enrolled in school, repeating her 'O' level examinations at Lycee de Kigali. Afterwards, she joined FAWE Girls' School and did her 'A' level studying physics, chemistry and biology (PCB). Although one cannot classify Janet under the economic conditions of Claudine, the former also grew up in poverty, something that would have prevented her from continuing with school. Moreover, the nature of the patriarchal society she was nurtured within could have swayed her towards studying arts and social sciences courses. However, as she explained to me, Janet had a high level of motivation to study science subjects. This motivation can be traced to her primary school. In primary school, Janet liked to study science and then in secondary school she adored studying biology because she wanted to become a medical doctor. As someone who also studied in the village, Janet told me that to maintain her grades at school, she would often stay late at school to study to avoid doing

some of the household chores that were expected of her whenever she would return home in the evening. She describes the learning environment and how she overcame some of the harsh contexts in which learning took place. She revealed to me the resistance she sometimes faced from her female colleagues - a mother of a friend who attempted to bewitch⁸⁵ her for doing well in class. She also talked about the importance that teachers placed on finding time outside the 'normal' teaching time to help students who had problems. She explained that each evening, students would be expected to have quiet study time on their own. Janet passed her 'A' level national exams thus getting a scholarship to study at the University of Rwanda. Janet articulates the role of her colleagues, especially the boys, as a strategy to help her succeed in her studies.

It is important to note that Janet faced some challenges when she had just enrolled in her science course at the university. One issue relates to the feeling that the water and environmental engineering programme was 'hard' and therefore was not something that women could study. As she continued, she thought that due to their 'soft' nature, women need to study 'soft' courses such as the arts and social sciences. However, as time went on, she got the 'confidence' to persevere and continue with the course. When I met her for this study, Janet asserted that she was among the best students in her class. She attributed this partly to the fact that group discussions with other colleagues including boys was significant to her success while at university. Below is an excerpt from Janet's narrative:

⁸⁵ The belief in witchcraft, which Middleton and Winter, define as "mystical and innate power, which can be used by its possessor to harm other people" (1963, p.3) in different African societies is as pervasive as ever. Many people associate witchcraft with the practice of using mystical powers to make someone barren (in case of the women) or impotent (in the case of men), to cause an accident, to be chased from a job, just to mention a few of these incidences. In relation to this study, there are beliefs that someone may bewitch a student to fail examinations at school or to just refuse to continue with studies. As such claims cannot be verified scientifically, one can also claim that witchcraft does not exist.

I actually came here to Rwanda after my senior four but always go back home (Uganda) for my vacation. My father died so my mother was the one taking care of me and my other sisters and brothers. I did my primary school at Matete and my first three years of secondary at Masaka senior secondary school. I remember at school there was a girl who was my friend and we were also neighbours at home so we were in the same class and her performance was not good so her mother got jealous of me and bewitched me because for me I continued with school and for her she dropped out. Though I was treated, my body had got swollen. So that was not a good experience. My uncle later came and picked me up from home although I was still in school. He saw the environment I was in and where I was studying and he was like I don't know whether you will finish school from here. You know when you are in an environment where people are not educated, it is difficult to continue with studies. He then convinced mum and that is how I came to Rwanda in 2010. In primary school I liked to study science then in secondary, I liked biology. I wanted to be a medical doctor. When I came to Rwanda, I had to repeat my senior three studies at Lycee de Kigali so that I could be able to continue my studies to 'A' level. I studied PCB at 'A' level and I passed biology and chemistry very well in the final national exams. This was at FAWE Girls' School. The teachers encouraged me to study, not to engage in other issues. We had specific reading hours like from 7pm to 10pm. I really got good marks and got a scholarship to study here at the university. I remember on joining university, I was at first shy and could not express myself. The class was full of boys. I had considered the course then to be more biological than physical. And also, I would get comments from people, saying why did you choose this degree course. I do not really like such comments. I know the subject is hard but I have no regrets at all in studying engineering. I am actually performing well now and what has helped me is the group discussions I have with my classmates especially the boys. The boys are very serious they do not have time for other things, so that is why I like to study with them.

The other case that I would like to draw on to show how young women have subverted social norms to study sciences at university is that of Judith. As pointed out in Chapter Six, by the time I did fieldwork, Judith was twenty-eight years old. Judith told me that she was encouraged by her father to study hard and become a medical doctor like him. Judith was not only ambitious but clever as well. With the death of her parents, her uncles and aunts took upon the responsibility of bringing her up with her brother. In spite of some shared interests with one of her aunties, their relationship was by no means easy. Judith told me that her aunt was complicated and a difficult woman to live with – someone who always wanted Judith to do all the household chores leaving no time to revise her books. Despite society looking at science subjects as the preserve of boys, Judith told me that she liked these subjects so much that she worked hard to excel in school from primary level. At 'O' level, she studied all the subjects but liked biology so much. At 'A' level, she specialised in sciences studying mathematics, chemistry and biology (MCB). When Judith first sat the national examinations,

she passed chemistry and biology but failed mathematics. She told me that she was unhappy about her failure to join university. Judith went to the Rwanda Examination Board to communicate her decision of re-doing the examinations, which request was granted. The Rwanda Examination Board usually has a system through which a candidate who has scored certain marks can retain those marks and is only required to redo the one s/he has failed. In Judith's case, she did not want to redo mathematics but instead opted for physics. This enabled her to do physics, chemistry and biology (PCB). It was during this second attempt that Judith passed and joined university for a degree in applied sciences (majoring in biology). Below is an extract from the interview I had with Judith:

Oh, as I have told you my dad wanted me to be a medical doctor like him. That is the very vocation that I have admired since I was young. When I joined primary school, I was so anxious to study. There were different subjects being taught, so I learned French but I think I liked science the most. I passed my primary level exams and then joined secondary school. At 'O' level we were taught both arts, humanities and sciences. Though I had good marks in the arts, I do think its biology and chemistry as a subject that I excelled in. Even students reached the extent of nicknaming me a biologist or chemist. When I joined 'A' level, I opted for the combination of mathematics, chemistry and biology. However, as I carried on with studies, I did not like maths, just did not feel it was a part of me – and that is the reason I failed to get a government scholarship on my first sitting of 'A' level examinations. I had passed the other subjects, biology and chemistry and with my marks, I went to the Rwanda Examination Board, talked to some officials there and applied to re-sit the exams. You know what, this time I did not want to redo maths because I knew I would fail it again, so what I did was to re-do physics as a subject. It was hard for me to switch subjects but at least I was at peace with myself that if I read hard, I could pass the exams and join university. This second time, the results were returned and I had passed physics and now had the required points to gain admission and scholarship to KIST.

Like other female counterparts such as Brenda, Janet and Claudine, we see Judith as a hardliner who does not give up on her ambitions despite the pressure from society. Judith's society constructs her as someone who needs to study subjects 'fit' for women. Her persistence led her to devise mechanisms that enabled her to achieve her dream of becoming a scientist. Not only did she persist in repeating 'A' level national exams in physics, she also joined discussion groups besides consulting lecturers from time to time considering the fact that she did not have a strong foundation in English. Judith had studied in Francophone schools in both Congo and Rwanda such as Ecole Secondaire Congolaise and College Saint Andre.

Lastly, there is the case of Nelly. Nelly opted for science subjects because she was so passionate about technology when she was a little girl that she hoped for an opportunity to achieve her aim one day in life. She also talked about the role of women in society and how they [women] have impacted her own confidence. She finds it 'normal' to be studying science courses and sees no problem because she passed her examinations at primary and secondary school levels and went through the proper admission procedures as stipulated in the university guidelines to be admitted to the university for a degree in construction management. On joining university, she was determined to learn and speak English fluently given that it is the main medium of communication and instruction in Rwanda. From her insights, one finds out that Nelly feels the same pride as her male counterparts in studying science and has the ambition of studying to reach the highest level in education. In her own words, Nelly tells me that:

Before in history they used to say men are greater than women but these days there is gender equality. What boys can do; I can also do. See I grew up like a boy. I don't know how it comes but I used to do boy's tasks like repairing computers. I used to like technology so much that I studied mathematics, computer science and economics for my 'A' levels. I did not have time to waste so I concentrated on my books. I really wanted to join KIST. I had never visited the place but just liked the university because its mission is to teach technology and science studies. So, when I passed my exams, I got a scholarship to come here at the university. I could not believe it. I chose to study construction management course. With this subject, we deal with the use of quantity surveys (QS) as a construction. The problem I am finding with my course is the use of English that teachers are using to teach because I had attended francophone schools during my primary and secondary studies. But I am catching up now because I have come to like the language [English] as it is what I use while communicating to colleagues. I don't use French or Kinyarwanda so that is helping me to improve on my eloquence.

Among the prevailing ideas from the interviews I have presented is the question of commitment. There is also the issue of resilience, determination and independent minds. These viewpoints confirm Erikson and Goffman's insights about an individual's identity. The views show how these young women scientists struggle to strike a balance between an individual (self) and social influences to become who they want to be. While some women may be constructed by men as people who are unlikely to study particular subjects, several male participants do not share in these stereotypes. As will be elucidated later, the young men I interviewed concretised the views presented by Brenda, Claudine, Judith, Janet and Nelly above. To illustrate these ideas, I have shared the views of a male student and male lecturer. In the following excerpt, I bring to the fore the experiences of George, a second-year student

of construction management, who constructs young women as people who can do what men do provided they are encouraged and given proper training:

Again, I do not understand when people talk about women studying science. From my experience, I have seen site engineers who are women [for example, an old school friend Anne Uwimana of real contractors]. If you look at her [...], you would not know that she is an engineer. She looks so jovial compared to how an accountant can be. You cannot believe why [a woman supposedly expected not to be happy while doing such a job can be very happy doing her work]. Everything depends on qualification. What she does at the site is simply interpret [the plan for the house] and send men to do the work. So that is why I am saying I cannot discourage girls from pursuing the course.

David, a lecturer in engineering, also shared George's ideas. According to David:

To be an engineer, one does not need physical strength to perform something [...] much as there are some classes of technicians who use bits of strength. Otherwise, for engineers, the first task is to supervise and design what will be implemented and the stage of design is sitting, thinking and trying to innovate something. For example, if there is a building [house] to be built whether administration or residential, I am, for example, an electrician but it is not me who is going to do the work but the force/or people going to be hired. But it is me who is responsible for the product. Therefore, what I have to do is to sit down and make a plan, and based on my knowledge, know how to install the electricity in that building and then with my product of design, I give them to the technician and then supervise how they are doing everything. So, you can see there is no use of physical force at all, but if technicians are not working as deemed, you have to show them how best to install like the wires. Therefore, it is a bad perception to think that for one to be an engineer requires lots of physical strength. These tasks can be done by both male and female students.

The above example by George and David concretise the views of Brenda, Claudine, Janet, Nelly and Judith. Women can also study subjects that could be defined as those suitable for men. As Belinda asserted, what matters is to put in more effort and be keen to understand the procedures of doing the right thing. As far as her programme of food science and technology is concerned, it draws from several other disciplines of study such as nutrition, microbiology, chemical engineering and agriculture. Belinda underscores the fact that she is more interested in the field of nutrition and microbiology, and that one can perform well if s/he is able to know that it entails processing, packaging, preserving and distributing food. Furthermore, the field of food science also calls for an effort to ensure that the food processed is healthy for consumption and can be preserved for future use. To Belinda, to excel and grasp all this information, it all depends on one's intelligence and determination, rather than gender.

Besides the above insights from my interviewees, the ideas of Beauvoir (1949), in her work the *Second Sex*, can be cited to ground the above views. Beauvoir argues that people are neither born women nor men but are only constructed by society to be who they are. If an individual is socialised under particular conditions, s/he can perform tasks that relate with that environment. From the cases quoted above, one could argue that men and women are equally capable of studying any subject at university provided one is socialised into the thinking that what is needed is the determination to do something. By opting to study sciences, young women tend to confirm this viewpoint.

Apart from the issue of women also being capable of doing tasks that are defined as masculine, there is the question of economic dependence. This idea emanates from the deeply rooted social view that women are likely to depend on men for their welfare and livelihood (Tinker, 1990; Abbott et al., 2005; Coquery-Vidrovitch, 2018). The question of men being at the forefront to provide for women can be probed more if we make reference to Tamale's works published on gender trauma in Africa (2004) and sexuality among the Baganda (2005). Among the crosscutting themes in these works relates to how control of resources becomes a tool for patriarchy to thrive in society. As Tamale puts it, patriarchal societies tend to relegate women to the domestic arena while men to the public one. Moreover, she shows how the prevalence of paid labour, among other issues in this sphere, enhances the power of men in society. On the other hand, Tamale explains that the domestic arena, which women occupy, is preoccupied with activities centred on the family – childbirth and rearing, cooking and taking care of the home - chores which do not normally come with pay. In other words, while men occupy a space where they control resources, women are relegated to the sphere where they only work for the survival of the family. In fact, one can argue that patriarchal societies do not remunerate women for the work they do since the latter are seen as working for their 'own' families. The above views by Tamale had earlier been presented by Jefremovas, writing about Rwandan women by asserting that "women's capacity to control resources [...] in Rwanda is extremely limited, both legally and socially. Women, however wealthy or powerful, are restricted in ways that wealthy and powerful men are not" (Jefremovas, 1991, p. 379).

However, this study shows that the young women studying science at university in Rwanda use such courses as a site for going against the above public and private divide. This means that women use a number of ways, as the cases cited in this study portray, to occupy the

public space and control resources. Moreover, education, especially that which is associated with studying subjects that are traditionally seen as 'fit' for men, has enabled young women to develop careers through which they can access certain jobs which pay lucrative salaries. To draw on the experiences of Janet, who was a student of water and environment engineering in her first year, she talks about being '*someone*' who avoids depending on other people. To this end, one could see that the pursuance of science careers guarantees the independence of women, to free them from the yoke of male domination. More so, as Janet completes university, she defines what she needs to be in the future and this determines the nature of the career Janet will embark on in future. Below is an excerpt from Janet and how it helps us in understanding how the studying of sciences contributes to the subversion of femininity through making women independent people in society:

I want to become someone big in the future and not to depend on people in the coming years. I actually recognised engineering in Rwanda and I would like to compete internationally. Can you imagine, people ask me different questions – like how did you find yourself in such a course? Why are you studying this? Do you have that time? Why do you have to bother yourself? But me, I am very proud and contented however much it will cost me in terms of time studying. I want to complete my degree and get a good job like in a telecommunication company.

During my interaction with Janet, she further told me that she could see women embroiled in daily struggles as they looked for food, clothing and medical care for their children. Janet talked about the fact that these village women could not only ask their husbands for food, clothing or medical care, but also money for school fees for their children and other necessities of the home. To Janet, her determination to join higher education was shaped by the need to become independent in the future as a means of escaping the reliance on men.

In relation to Janet's observations, 'real' women in the Rwandan context are those females who are not only submissive to their husbands, but also dependant on men for their day-to-day needs. If a woman in a home does not have food, she is obliged to ask for it from her husband. One is also obliged to ask for clothing and other personal effects from the husband. In cases where a man gets a woman with items, which he himself did not provide, the result is fighting.⁸⁶ As such, when Janet talks about studying sciences in order to become independent in the future, these subjects can be looked at as a means of survival which, in the Rwandan

⁸⁶ See <https://www.care.org.rw> › programs › vulnerable-women ›.

context, relates to femininity as a process of constructing women in society as subjective beings who are most likely to depend on men for their survival.

7.3 Career Development as Opposed to Marrying and Creating a Family

Throughout this thesis, I have demonstrated how cultural constructs portray women as people expected to give and nurture life. To give and nurture life is to bear children and ensure that they are catered for in terms of the basic needs of life – food, shelter, clothing and medical care. In Chapter Six, I pointed out that in the Rwandan culture, when a girl reaches adolescence (that is, when she reaches about sixteen to eighteen years), she is expected to be in a relationship. In other words, an adolescent girl is expected to be in a relationship with a young man and is expected to make him a husband in the future.

Uwineza and Pearson (2009) re-echo the above view when they argue that the “Rwandan culture place[s] great importance on marriage, and married women and men [are] given special respect and recognition in society. [Like in] other [areas], marriage [...] recognises[s] and respect[s] women’s independence” (p.10). If she does not get married immediately after experiencing her first menstrual periods, society begins preparing her for marriage, which is expected to be formalised by the age of 21 years. Writing about issues of sexuality among the Baganda of Central Uganda, Tamale (2005) demonstrates what the Baganda girls undergo upon reaching puberty. She notes that when adolescent girls begin menstruating, the *Ssenga*, who is the sister to one’s father prepares her for marriage. As Tamale puts it, the *Ssenga* “played a pivotal role in the courtship and negotiations surrounding her niece’s marriages. Her primary responsibility was to groom her nieces to become ‘good’ subservient wives or co-wives, a husband who was dissatisfied with his wife’s behaviour [...] would blame it on the laxity of her *Ssenga*, even returning the bride to the *Ssenga* for “proper training” (Tamale, 2005, p. 17). From these viewpoints, it becomes explicit that young women who reached puberty were looked at as people who needed to prepare for marriage and as Tamale (2005) has noted above, specific family members were judged with specific roles in preparing/mentoring these young women for future marriage tasks.

In fact, girls who go beyond 30 years without getting married can be looked at as “loose women” (to borrow Jefremovas’s words (1991, p. 382). Although such women may lead a life independent of men, society constructs them as women who are not able to live with one man but keep on going with different men at different times. Otherwise, at about eighteen

years, girls are expected to get married and not only bring to their fathers' households "additional income" (Chege and Sifuna, 2006, p. 4) in terms of bride price, but also produce children as a way of "retaining or perpetuating the family name" of the husband's lineage (Edewor, 2006, p. 55).

Besides the family and community constructions about the role of women in the school, I have already discussed how the school encourages or discourages the above constructions about women. Schools construct subjects like history, religious studies and home sciences as feminine, to show that they may be studied by women. As Francis also writes in her article on gender and the choice of subjects at school, "arts are associated with emotion and subjectivity while sciences are associated with high status traits" (2000, p. 35). To her, this dichotomy to differentiate subjects between qualities of low and high traits is intended to create power divides between men and women, with the former constructed as exhibiting higher status traits while the latter as the "other and substandard" (Ibid, p.36). This idea by Francis reinforces my argument as presented in Chapter Six that schools and the university are platforms for gendering subjects with arts subjects being presented as feminine while sciences are presented as masculine.

Different factors are responsible for this categorisation. Firstly, my study has revealed that science, arts and social science courses take different periods of time to complete. Usually, a person studying an arts course such as Linguistics and Literature at university takes a minimum of three years to finish, despite degree programmes like Law taking four years at university and one year of a legal practice course. A degree in Education also takes four years – three years of theoretical work and one year of school practice. In constructing women as persons who are most likely to study arts courses, society expects women to finish school early and get married, produce children and take care of them.

On the contrary, individuals opting for science courses in architecture and engineering take about a minimum of four years to finish their programmes. Other programmes such as general medicine takes five years. The time lag, especially in relation to science courses makes it particularly difficult for young women to opt for such science degree programmes. Not only do some parents discourage women from pursuing such courses, but also the extended family and the community at large are likely to expect only men to pursue courses in science. They view the long period of time spent at school as an impediment to fulfilling

such obligations as getting married, produce children and begin one's family on 'time'.⁸⁷ In addition, young women who 'overstay' at school are perceived to be 'complicated' or persons who may not be good or submissive to their future husbands. A woman of this nature maybe perceived as someone who cannot cook, clean the house, wash clothes and take care of other members of the family. One is seen as a 'book worm', someone who is more or less married to books rather than a man. The experiences of Nelly, a second-year student of construction management, which were also quoted in chapter six, can also be used here to concretise the above idea:

People used to say too much education and studying at university will give me no time for myself or even time to get married. But me, I know that if I get married, there will be no more education, no attainment of a university degree, so I will have to delay marriage in order to attain my dreams of becoming an engineer.

In addition to Nelly above, Janet, studying water and environmental engineering, talked about the way her relatives and other community members emphasised the issue of marriage to her, at the expense of her career development. Janet said that:

Ehh, it is a problem when I go back home for holidays. They [people] ask me questions like when am I getting married, even when am not yet done with studies. Then, I wonder if I get done with studies, what will happen if I don't get married. They are used to girls getting married in the middle of studies, that is to say, first or second year. But me I cannot, until I finish studies, then get a job and if I get a chance, I continue for my masters. Then, may be, after then, I can get married. I just don't know.

What is presented by Chege and Sifuna on girls' education in Kenya also relates to the cases presented above. Chege and Sifuna, pointed out that 'even in regions where there is acceptance of the importance of education for women; it has been observed that parents tend to discourage 'too much' education for their daughters. There is always the fear that if a girl is highly educated, she will have difficulties in finding a husband or being a 'good wife'. In poor households, this value certainly takes on a significant meaning, particularly as girls approach puberty' (2006, p.4).

⁸⁷ It is important to note that both men and women are expected to get married at 21 years (which is the legal age for one to get married in Rwanda). Despite the age for one to get married being the same for men and women, the pressure is usually more on girls than boys. I have already mentioned how the Rwandan society regards those young women who take long to get married as loose women or people who resist cultural norms. One becomes a social outcast if she takes long to get married and begin her own family. On the contrary, boys do not have much pressure to marry. Society expects them to finish school get a job and be able to marry.

Chege and Sifuna (2006) also point out that in situations when girls tend to overstay in education, parents withdraw them from school to marry, for fear of the girls becoming pregnant before marriage. In most African cultures, girls who become pregnant before marriage are viewed as a waste in the eyes of their parents, since they do not attract the required bride price.⁸⁸ Edewor, writing in relation to the Isoko of Nigeria, introduces another perspective and notes that in cases where the girl becomes pregnant while at school, the pregnancy is either terminated and the girl continues with school, or she carries the baby, gives birth and later returns to school after delivery. As he writes, “whereas pregnancy and childbirth abruptly terminated a girl’s schooling in the past, things have changed. The mother[s] of such girls look after the baby while the girl goes back to school” (2006, p. 67).

Edewor’s issue re-echoes the experiences of Belinda, who was a first-year student of food science and technology during the period I conducted this study. As pointed out earlier, Belinda was 25 years old when I first met her. She told me that her father died in 2005, when she had just finished primary seven. Despite the death of her father, she continued and went to secondary school. However, she dropped out of school in senior one due to difficulties with paying her school fees. She stayed with her mother to help with household responsibilities, and it was during this period, which she describes as a ‘period of redundancy’ – when she fell pregnant. According to Belinda, her mother was seriously disappointed when she heard of her daughter’s pregnancy. The mother decided to send her to an aunt (the younger sister of the mother) in Rwanda so as to avoid the ‘shame’ Belinda had brought on the family. Belinda gave birth at her aunt’s home and then returned to school after a short period of time.

Despite the determination of Belinda to return to school and later pursue a bachelor’s degree in food science and technology, she would be regarded as a woman who defied the moral code of Rwandan society. As Jefremovas (1991) has demonstrated in her work, the Rwandan society expects women to remain virgins until they are married. This moral standing gives the

⁸⁸ In their article on the implications of bride price on domestic violence and reproductive health in Uganda, Kaye et al. point to bride price, which is historically regarded as a gift exchange, involving the ‘exchange of materials or money from the man’s to the woman’s household’ (2005, p.300). Bride price has been at the centre of Kinyarwanda marriage culture since pre-colonial times. Besides the local beer (*amaarwa* and *urwagwa*), cows, goats and hoes were the main items used to pay for someone’s daughter. Unlike in the past, when payment took a material form, the contemporary Rwandans prefer paying the bride price in terms of money, which is determined by the educational level and the employment status of the girl. Few people still value the payment of the bride price in terms of cows.

young woman an opportunity to not only receive favours from the parents, but also respect from community members. According to Jefremovas, to bear an illegitimate child, that is to say, the child born before one gets married, is tantamount to being a 'loose' person. At the beginning of this section, I mentioned that as society expects a young woman to get married before thirty years old, one who lives alone or has a child without being officially married is regarded as a 'loose' person. This is a woman who is seen as failing to marry because she enjoys a life independent of men. She is perceived as someone who co-habits with one man after another, thus leading the lifestyle of a commercial sex worker. Being considered a loose woman in Rwanda has the disadvantage of being denied basic life needs from one's immediate family. Drawing on the experiences of Belinda discussed in this chapter, she did not "act correctly as a timid virgin and dutiful daughter" (to borrow Jefremovas's words (1991, p. 387)). One could argue that Belinda did not behave in the socially acceptable way that demands a young woman stays a virgin until she is married to her future husband. Although she experienced the stigmatisation of leaving home to stay with her aunt and was labelled a person who had brought shame on her mother, Belinda did not give up on her studies. She told me that the above issues motivated her to study hard to the extent that she saw education as a way to help not only her herself, but also the entire family. Moreover, her decision to embark on a career in science was part of her ambition. The following is an excerpt from the interview I had with Belinda and can be used to illustrate her enthusiasm for studies after she had given birth:

As I told you, I came to Rwanda in 2007 when I had completed senior one. I do not stay with my parents because my mother stays in Uganda and I left Uganda to stay at my aunt's place here in Rwanda – she is my guardian [...]. But I have not told you all about my life [...] things I have passed through in life to get where I am today (a bit of crying). It was so difficult [...] my childhood experiences were not that easy, but I was able to persevere and I now feel confident to talk to you about my life journey. Before, I could not say a word to anyone about my life. Me, when I started senior one at the end of the last term, I became pregnant. Then I had to leave home in Uganda [my parents' home] and came to Rwanda to stay with my aunt. Life was not easy and at this point in life, I should have given up on everything even school and just get married. But I felt within me that I like to study and thought that I would never achieve anything good without being educated. When I arrived in Rwanda and gave birth to my child, my aunt took me back to school. But the people in the community were the ones that thought negatively towards me that I should get married. I told them that I do not want to, and just want to continue with my studies. They even said that I would not achieve anything, like performing well at school, that it is just wastage of resources and I should be at home and look after my child. Can you imagine? Now they cannot believe that I have come this far and am actually studying science at university. Really, experiencing such difficult times, being an orphan and giving birth at an early age, gave me the strength to study. I realised that studying was the only way in which I could regain my life and help my family. I was motivated therefore to succeed. I looked for all possible ways to succeed which has made me want I am what I am today, and I could not imagine this before.

My educational journey has been similar to Belinda's. But unlike Belinda who had dropped out of school in senior one, I progressed through all the levels of education from primary to secondary school, undergraduate to master's and finally enrolled on a PhD. When I gave birth to my son before marriage, I was perceived as a single mother, an identity that comes with numerous negative connotations. Some of my family members believed I had 'shamed' them, 'robbed' them of the much-needed bride price for the family. Unlike some of my family members, mother⁸⁹ was such a pillar of strength, a person who encouraged me to focus on the future.

Mine and Belinda's situation, as discussed above, brings to the fore two major issues, namely agency and social mobility. Ashcroft et al. in their work on post-colonial studies define agency as the "ability to act or perform an action" (2013, p.9). They continue to argue that agency "hinges on the question of whether individuals can freely and autonomously initiate

⁸⁹One can be compelled to ask the question as to why most mothers tend to sympathise with their daughters during times when the latter become pregnant and produce children. Is it because they have experienced the same feelings and emotions of having children? This can become an area of investigation by future researchers.

action, or whether the things they do are in some sense determined by the ways in which [they are usually defined]” (Ibid, p.9).

By relating these insights to Belinda’s experiences, we see her as someone who has initiated action. In spite of Belinda following the expectations of her family and community to get married and nurture children after giving birth, she decided to venture into education. She could not yield to the pressure to marry and bring home the bride price. Instead she went back to senior one, did her ‘O’ level examinations, which, according to her, she passed very ‘well’. Afterwards, she proceeded to advanced level where she did physics, chemistry and biology, one of the pure science combinations. Then, she was admitted to an institution that was later renamed the College of Science and Technology, University of Rwanda, for a Bachelor’s degree in food science and technology. Although she wanted to become an engineer, she did not come to study the course because she had not majored in mathematics as one of the subjects in her combination at ‘A’ level. As she told me, her ambition was to finish her course and get a job with one of the government agencies such as Rwanda Bureau of Standards (RBS) or Inyange Industries, which deal with processing and packaging of soft drinks in Rwanda. Her other ambition is to be self-employed, to do work related to her field of study. All these demonstrate the determination with which Belinda has had to fulfil her ambitions in life despite the social expectations of her peers, family and the community as a whole.

When Belinda talks about the need to finish school, get a good job and perhaps help her family members, she explicitly brings to the fore the question of social mobility. Generally speaking, social mobility is the change of status of an individual from a lower to an upper position (Riddell, 2013). In this way, one can look at education as among the means through which the social mobility of a person can be measured. Returning to the case of Belinda as outlined above, we see her status rising from a single mother who had dropped out of school to a student in a high-status university within the GLR of Africa studying sciences. At the end of it all, Belinda finds herself with a status that some women in her society are not able to attain.

Another case that comes again to the fore is that of Nelly. When I first met her, she told me about her family background – her father and mother who were both soldiers but they died before she joined university. Despite having some relatives, Nelly lived on her own after the

death of her parents. Although Nelly's primary and secondary education was catered for by her parents, she got a government scholarship for her university education. By talking about the societal expectations that women are supposed to get married upon reaching adolescence or after finishing the undergraduate degree, Nelly shared her insights about marriage and these views can be used to understand how young women studying sciences negotiate these issues to develop their careers. According to Nelly:

I do not think so much about marriage. I cannot get married now without getting money. I think it is good to first finish school and then get married. It is hard to get real love and if you have your degree someone will come for you, you are comfortable and with a degree, you can achieve a lot because you are respected. Even though you do not get a man who will marry you, you will get a job. You can even get kids along the way and create your own name and when you get to that level, you cannot fail to get a husband (laughs).

Like Belinda, Nelly's case is one where someone strives for social status through education. This is opposed to conforming to societal expectations that women and men should perform specific roles when they become adults. Moreover, Nelly's social status is changed through studying sciences. While Belinda and Nelly were under the pressure of their relatives to get married and begin their own families, the case of Brenda was different. Unlike other cases discussed above, Brenda came from a rich background. Besides the father being a veterinary doctor and her mother working as a nurse, her only sibling (an elder sister) was a medical doctor. In a way, one would say that Brenda did not have the family demands/pressures to look for work to support the family. However, her peers saw her as someone who had become old enough to have a man and get married. But Brenda never fully came to terms with this conflict between her own ambition and coping with the constructed feminine behaviour. When she was nineteen years old, she was advised by her friends to offer her hand in marriage to a wealthy and well 'connected' man, which would have meant prestige, money and this to a 'right' thinking woman may have been success in life. However, it must have been their disappointment to see Brenda turn down the 'opportunity'. Instead, she focused on her studies – exploring her hopes and ambitions to reach higher in life. She had to persevere with her studies and complete a degree in estate management and evaluation as part of architectural studies. In her own words, Brenda told me the following:

For me now my career is very important. I would say that it is very difficult to do an architectural course when married because as I say it needs time investment [...] so you can't invest your time in family and studies and really they are certain courses that really need time and to get married you cannot cope. You know I had friends who suggested to me that I get married to some wealthy man. But I could not do that- stop my studies half way and get married because of money. I know when I finish my studies, I will get a job and be able to look after myself. Actually, most of the students who got married while pursuing science subjects you find that most of them drop out and pursue art subjects.

7.4 Government Policies and Bursaries

Women have a huge influence on the well-being of their families and societies [and so] the effect of women's education on population growth, economic growth and poverty is enormous (Masanja, 2010, p. 2).

In the quotation above, Masanja, a renowned feminist scholar underscores the role of women in the development of any nation. She talks about how women influence the well-being of the family and society. To this end, Masanja emphasises the fact that educating women has an effect on population and economic growth as well as the poverty level of the country. Besides the above advantages of educating women as pointed out by Masanja (2010), Hadden and London (1996), in their article on why the education of girls is paramount in the third world, enlist the following as the benefits of educating women in developing countries; i) leading to decline in fertility rates and improvements in health and mortality rates; and ii) giving rise to greater labour force participation in adulthood and higher earnings. These ideas point to the need by countries around the world to take education for women as a priority since it not only fosters the well-being of families and societies, but also the development of the country as a whole.

Because of the realisation that the education of women is important for the development of the nation, the post-genocide government of Rwanda, since 1994, has put in place a number of policies with the aim of providing education to women. In addition to the numerous policies geared towards providing education to women are the bursaries that the government gives to young women in tertiary institutions although sometimes the government gives these young women bursaries to cater for their secondary education. In this section, I discuss how government has worked through different policies to provide education to women, especially those who pursue careers in science. I also demonstrate how the bursaries given to women encourage them to study courses in science. As such, one can argue that government policies

and bursaries have provided a platform for young women to negotiate their way to pursue careers in science at university. My main argument here is that by looking at the profiles of some of the participants in this study, it becomes apparent that the government plays a significant role in helping young women negotiate the socio-cultural and economic challenges that have historically prevented them from studying science at university. As such, the government stands as one of the 'guarantors' of science courses for young women at university in Rwanda. To articulate these issues, I find it prudent to begin my discussions with how the government has worked through different policies to provide education to young women, with the intention of promoting the study of science courses at university. The allocation of a specific number of slots to girls, access to education by all children in the country, filling the skills gap in science and technology, working to mitigate teenage pregnancies as well as networking with other stakeholders to provide education for young women are among the strategies the government has adopted through its policies to ensure that women also acquire education, specifically in the area of science.

The Girls Educational Policy (2008) and The National Gender Policy (2010) highlight issues related to accessibility of education and how different categories of people should access it. Although Rwanda emphasises equality in education, the government has recognised the fact that women have traditionally lagged behind in accessing education. This challenge is more apparent in science degree courses since they have traditionally stood out as areas where women are underrepresented. Science disciplines such as mathematics have traditionally been dominated by men since they are 'hard' and demand a lot of 'concentration', which society may claim are attributes lacking in women (see Uworwabayeho et al., 2007; Huggins and Randell, 2007; Masanja, 2010). To curb such challenges, one would say that the government at policy level has 'ring-fenced' certain slots to be for women in both secondary and tertiary institutions. In the Girls Education Policy (2008), under the proposed affirmative action, one of the issues emphasised is the need to ensure that 50% of the places for higher education are reserved for women as a means of closing the gender parity in education. Related to the present study is the policy's emphasis on how science subjects need to be prioritised by the different stakeholders, not only to close the gender gaps in terms of enrolment in science, but also to help young women access opportunities in these areas. Lastly, the policy brings to the fore the need for female students to join public secondary schools where one benefits from subsidised government school fees given by the government. As the case of Belinda, a

student of food science and technology shows in the following excerpt, government policies may have enabled several young women to opt for sciences at university since girls are given priority besides being admitted with lower points than their male counterparts.⁹⁰ Belinda had this to say:

For me to choose to study science subjects, it was because of the government policy. I liked other subjects like geography and history but I was not sure of where to get funding for my 'A' level studies. The government encouraged us girls to study sciences and ensure that we study hard and pass well so that we could be admitted in government secondary schools. And we were told that we the girls would be admitted on lower marks than the boys. [Was the intention of the government]. So that really encouraged me and the other girls to like science and perform well in my 'O' level exams.

Besides allocating specific slots to girls, there is also the idea of ensuring that education is made accessible to all children in the country. The government has enacted several policies that underscore the issue of education for all. These policies include the Education Sector Policy (2003), Girls Education Policy (2008) and National Gender Policy (2010). The Education Sector Policy has it that basic education shall be provided to all Rwandans – women and men, boys and girls. Among other issues, this policy advocates for universal primary education for all, making basic education go up to 12 years instead of 6 years⁹¹ to eliminate gender disparities in education by enabling girls to stay in primary school and later join secondary schools. Another idea relates to ensuring secondary and tertiary education through putting emphasis on day learning instead of boarding for secondary learners and taking into consideration specific constraints and needs as a means of tackling tertiary education.

Developed by the Ministry of Education, the Girls Educational Policy was developed in 2008 with the aim of helping to meet national and international commitments to education as well as bring the education sector policy in line with the National Gender Policy.⁹² Its main

⁹⁰ The reservation policy of 50 percent slots for girls has enabled a section of girls to join upper secondary school level regardless of their region of birth or social group thus being instrumental in correcting the existing gender imbalances in science education. For more details, see the Girls Education Policy (2008).

⁹¹ Rwanda adopted the free and compulsory 12 year basic education program (6 years of primary education and 3 years of lower secondary education and 3 years of upper secondary education) in 2012 with the objective to ensure equal access to education for all Rwandan children. This has enabled girls to remain in school and complete their education within the set number of years for primary and secondary education.

⁹² See the Girls Education Strategic Plan launched in 2008 in pursuance of the goals of the Girls Education Policy in Rwanda.

objective is to address the factors that prevent boys and girls from entering school and provide a hospitable environment that encourages them to stay in school. Lastly, the National Gender Policy (NGP) is geared towards the promotion of gender equality and equity in education through a process of mainstreaming gender needs across the education sector. This gender mainstreaming idea has as part of its programmes activities that encourage young women to study and perform well in all fields including science. As already pointed out, these national policies are also aligned with international treaties especially those that spearhead education of all children at all levels irrespective of their gender identities. From the New Partnership for African Development (NEPAD) to Education for All (EFA) and Millennium Development Goals (MDGs) particularly the one on universal primary education as well as the MDG⁹³ on promoting gender equality and empowering women, the national policies on education are meant to relate to those developed at the international level. Some of the views from the participants of this study attest to the fact that such policies provided a platform for them to achieve their goals in education especially in their pursuit of careers in science. Among these participants is Claudine, a student of biology who told me that:

I have seen that because of government's policy on free education some girls are able to attend school. Twenty years back you could find a lot of girls out of school and just working in tea plantations and as domestic servants in families. There are still girls today who work as housemaids, but at least they are few. Like me also, we are quite many children in the home, so you see our parents may not be able to cater for all of us. Because of these policies and strategies by government of making it mandatory for all children to go to school, it has helped me go to school and be where I am now.

Similarly, when I met Peter, a parent working for a government entity, he had his daughter who had a degree in human medicine. Peter, educated his daughter from primary school to university. He made comments about the situation of government provision of education to the girl-child. Although Peter was appreciative of the government policies and practices, he expressed anger at the resources/money he had invested in his daughter to complete university education. In his own words, Peter told me that:

⁹³ During this study, Rwanda had achieved the UN Millennium Development Goals of universal access to education and primary education. This is significant because the country achieved this before the September 2015 deadline. Net enrolment for example in primary school was 97.4% for girls and boys 96.3%.

The government has subsidised the cost of schooling. Education is free in primary and secondary school. My daughter was able to attend school with no problem. Except, we as parents we could contribute the other things like buying uniform and exercise books. She later managed to join university and study medicine. She had a scholarship but as you know she still needed some extra income to buy some items and as parents could avail all that she needed to make her learning a success. She finished university and got a job, and immediately also got married. So, I am wondering whether it was worth sending her to school. It is better that I only put emphasis on my sons.

Like other patriarchal men, Peter considered education for young women as a waste of a father's resources. Rwandan society defines women as people who bring back to their parents nothing or 'very little'. This has made most parents (especially men) to discard the idea of educating their daughters. As Peter told me, had it not been the government's strict policy that emphasised education for all – including the education of girl-children, his daughter could not have made it to university to study medicine. To this end, government policies have been significant in influencing not only the parents to take their children to school, but also to advocate for conditions that enable both men and women to attend school and further join university. Similarly, as Nkurunziza et al. (2012) have noted, through these policies, the government has been able to abolish school fees for children attending government primary schools, to enable them to attend school.

Another issue that the government has underpinned is addressing the question of constraints and needs that impede girls' education not only in primary and secondary schools, but also in higher institutions of learning. In other words, what are the obstacles preventing girls from enrolling in school? What makes these young women drop out of school? How can girls who have become pregnant and given birth be facilitated to return to school? In the following paragraphs, I demonstrate how the government, through several policies, has mitigated these issues to enable girls to stay at school. By enhancing these young women's chances of staying at school, the government explicitly facilitates their chances of pursuing careers in numerous disciplines including science at university.

It is important to note that among other issues, the Girls Education Policy aims to ensure access to education for girls. It also strives to aim at ensuring that girls remain at school for a substantial period of time. To do this the policy advocates for remedial lessons for girls seen as being at the risk of failing or dropping out of school. To encourage girls to stay longer at school is to increase their chances of pursuing careers in areas such as engineering, computer

science, human medicine, pharmacy, to mention a few of these science courses.⁹⁴ There is also an aspect of allowing young mothers who are at school to take their children for immunisation and not harass them when they do not attend some of the classes since motherhood comes with numerous challenges and responsibilities. As mentioned in relation to Belinda, a number of young women have managed to complete school due to the stance by government to create an environment where girls are encouraged to stay longer at school. Belinda became pregnant while in secondary school. She stayed with her relatives until she gave birth. She only returned to school when the baby had grown a bit to be cared for by her maternal aunt. Belinda told me that since she was a day scholar who could be at school during daytime, she could only return home in the evening to also take care of her baby. As motherhood comes with several responsibilities, Belinda noted that while at school, she could openly tell her teachers about the need to be excused to take her baby for immunisation. She stayed at school pursuing her secondary education until university where she enrolled for a bachelor's degree in food science and technology.

I assumed that it would have been difficult for me to continue school after giving birth to my child. But as I have told you before, my aunt encouraged me to return back to school. I would leave my child with my aunt and go to school. But as you know, for a mother there are certain things one has to fulfil for a child and I had to be there in person like in instances when my child had to be immunised or when sick, I had to take her to hospital. I would be at school and then be called by my aunt that the child is sick. And what could I do? I had to tell the teachers on duty my story and they were very positive. They would let me go home to take care of my child. At first, I was even afraid to talk to the teachers especially the dean of students - that I do have a child. I thought the dean was going to be rude to me and talk about me among all the teachers and students. You know my community can disown young girls who have given birth while still at school. But the dean of students and the teachers were nice to me, and would let me go out of class to check on my child and later be back at school.

As can be seen from Belinda's experience, it is due to the enactment of such 'favourable' policies like the Girls Education Policy by the government that some young women in Rwanda have been able to complete school. As already pointed out, one of the issues that explicitly comes to the fore in the Girls Education Policy (2008) relates to allowing girls who have given birth have another chance to study again. The policy also advocates for the creation of favourable conditions to enable such young mothers to stay longer at school to complete their studies. Moreover, such policies have helped these girls to pursue the careers

⁹⁴ I have already pointed out in this thesis that someone studying a science course takes a longer time to complete than those who study arts or social sciences. To take as an example, to study human medicine, one takes about five years unlike a Bachelor's degree in arts with education.

of their dreams. As science courses demand more time, to push for policies that call for girls to stay longer at school has translated into some of these girls enrolling in these science courses.

In the next paragraphs, I discuss how government policies have called for filling the skills gap. The skills gap in Rwanda, like in many developing countries, is usually related to having limited skilled personnel in science and technology disciplines. In most cases, such deficiencies are as a result of limited facilities – laboratory equipment and qualified teachers. However, as this study has revealed, the lack of qualified personnel in disciplines such as science is partly a result of the socio - cultural constructions including the view that women are not intelligent people (Brush, 1991) who can study such subjects. By the government coming in to encourage people to enrol in such subjects, it implicitly enhances the chances of young women to pursue careers in science at university. In the Educational Sector Strategic Plan (ESSP) 2010-2015, which is an implementation plan set up to execute the Educational Sector Policy (2003) for an interval of five years, the government underscored the crucial role science and technology plays in national development. It recognises the fact that national development in terms of reducing poverty and creating wealth hinges on the disciplines of study such as science and, as such, encourages citizens to embark on careers in these fields. Moreover, due to the high demand for specialists in science disciplines, those who are qualified are paid quite ‘well’. To tap into such jobs, young women have taken up this challenge and below I share the experiences of some of my participants, beginning again with Belinda whose views were as follows:

Studying food science and technology will help me start up a project for myself because like when in the laboratory, we learnt how to make cassava flour, flour which can be supplied to the neighbouring countries, which do not grow cassava. We did the laboratory work and I found out that our food here is good – and if it can be preserved in a way some scientists recommend, then that would be good. In the laboratory, we used cassava flour and soya flour. We got soya beans, cleaned and sorted out removing all the dirt. We then get to roast soya using the machines in the laboratory then the result is some flour mixed with sugar, which we then use to make cassava flour. We also learnt how to make bread, cakes, soft drinks and how best to preserve them. So, you see all those things I have learnt and if I complete my studies I can either look for a job or decide to be an entrepreneur. I really want to help my family get out of poverty.

As shown above, Belinda projects her degree programme, which is food science and technology, as something that will enable her to acquire unique skills, which are vital in job acquisition. As someone who comes from not a relatively rich background, Belinda told me

that her food science and technology course stands as a gateway through which she can access a ‘good job’ which can earn her a big salary so as to move her family out of poverty. Similarly, George’s ideas relate to the views that Belinda shared above. To him, science subjects offer more opportunities than arts courses. Using the case of accountancy, George, a student of construction management, argued that a company can employ only one accountant in an institution but there are many chances for engineers in the construction industry. Below is a quotation of what George had to say:

Looking maybe at things to do with arts subjects, it is okay and suits the girls but at the end of the day how many are going to be employed, since even the institutions offering jobs like accountancy need like one person for the job and yet today we have very many construction industries and they need people. I think the girls have got to go for studies in the sciences because of the readily available jobs on the market.

Lastly, it is the policy of the government to encourage networking between different stakeholders to ensure that girls are also encouraged to participate in science education from primary through secondary to tertiary institutions. Besides the GoR, different local and international organisations are involved in the education sector in Rwanda. From the international scene, different activities in education are sponsored by the DFID, UNICEF, UNESCO, World Bank and the SIDA. On top of international bodies are the local NGOs, which fund a number of projects in the education sector. These local organisations include AVEGA, FARG and FAWE, with the first two being genocide survivors’ funds created in 1995 and 1998 respectively to support the 1994 genocide survivors and the latter to support the education of the girl-child. To throw some light on how some of these organisations work to support education for young women especially those who study science subjects, I want to draw on the DelPHE project that I highlighted on in Chapter One.

DelPHE, which stands for Development Partnerships in Higher Education, was a project sponsored by the British Council between December 2006 and March 2010 in Rwanda. This project was managed by the British Council on behalf of DFID. It underscored the need for partnerships between universities in the UK and those in the developing countries, with the University of Rwanda and the University of Aberdeen (Scotland) working on joint projects. DelPHE’s main aim was to promote gender equality and undertake research to uncover the main barriers to women’s full participation in science and technology. In this regard, the project targeted young women not only in primary and secondary schools, but also in tertiary institutions. The DelPHE project in Rwanda undertook research to establish the barriers to girls’ full participation in science and technology subjects at all levels of education, with the

ultimate goal of ensuring that the country delivers on MDG 3. MDG 3 calls for closing gender gaps in education, besides bridging gaps in science and technology education.

The outcome of this project in Rwanda was the dissemination of the research findings on girls in science and technology education as well as making policy recommendations to government to implement what was found out. The result of the interactions between DelPHE with different stakeholders particularly the government,⁹⁵ was the putting into place the affirmative action policy. This is the policy, which demands that more girls and young women should be given opportunities to enrol in programmes in science and technology at the different levels of education. Moreover, by disseminating the findings that accrued from the research conducted, the DelPHE project led to awareness about the challenges young women encounter as they pursue careers in science.

Due to the affirmative action policy, many young women have joined university. Furthermore, by qualifying to join university, many others have received government funding (through loans and other bursaries) thereby being able to pursue programmes of their own interest. The excerpt below, taken from Nelly's interview, a student of construction management can be used to concretise the above observation:

I got a government scholarship to study my course at the university. I really don't know if I had not got the required marks, if I would be able to study at university. I remember the government releasing scholarship results in newspapers. I went out and looked out for my name in the newspaper and I found that I had passed and I was given a place at KIST.

7.5 Conclusion

In this chapter, I have discussed how young women negotiate their way to study science courses at university in Rwanda. Particularly, I have discussed how they negotiate the socio – cultural constructions of their communities to study such subjects as biology, mathematics and chemistry at university, subjects which enable them to pursue courses in engineering, food science and technology, construction management, among others. More so, the chapter

⁹⁵ The then Minister of Education, Dr Charles Muligande (by the year 2017 was the Deputy Vice - Chancellor in charge of Institutional Advancement at the University of Rwanda) was the guest of honour at the DelPHE policy brief event in March 2010. When he presided over the event, Muligande pledged to renew efforts to ensure gender equality in education and promote girls into science and technology. This meeting also brought together other participants including, academics, and representatives from NGOs.

has also discussed the role of government in curbing the gender gap between men and women through enacting different policies that enable young women to stay longer at school.

To this end, the chapter demonstrates how the study of these subjects becomes a platform through which young women subvert constructions of femininity – to show that despite being women – they can also study science subjects that have traditionally been defined as masculine. In this regard, the chapter has demonstrated how young women scientists have sustained the impression of who they are and what they want to be in relation to what society expects from them. Furthermore, the chapter shows how several women in the different government departments have influenced young women to aim higher by studying subjects that have been constructed as masculine. From these discussions, this chapter concludes that by resisting various socio-cultural barriers to study science subjects at university, these young women have encroached on men's spaces. They use the opportunity to study these subjects as a site to show men that they also do what men are able to do. Lastly, it is pertinent in this chapter to conclude that the government has participated in facilitating young women to negotiate the socio-cultural and economic barriers to pursue careers in science. As pointed out above, by enacting numerous national policies that demand gender equity in education and those that encourage young women to spend more time at school, the government implicitly enhances the efforts of girls to study science courses at university. These national policies have been supplemented by international treaties in education that the country has ratified.

Chapter Eight

Summary, Conclusions and Recommendations

8.1 Introduction

My motivation to conduct this research started when I got a research assistant job at the University of Rwanda - College of Education, to work on the DelPHE project, which dealt with girls studying science and technology. The aim of the DelPHE project was to identify the barriers to girls' participation in science and technology, with research covering different levels of the education sector in Rwanda namely: primary, secondary, and higher education. As I executed my tasks while I worked under this project, I was confronted with numerous issues that affect women, including the way they negotiate various socio-cultural issues in society. These are the very issues that I also experienced as a young woman growing up in my community. It is important to emphasise here that as they struggle to fulfil their ambitions in life, young women encounter numerous challenges. In the field of education, these challenges are also experienced as young women struggle to pursue careers in science. It was these issues that influenced me to embark on a study to explore how girls negotiate the different socio-cultural constructions to make it through university in a bid to pursue careers in science.

8.2 Summary of the Study

This study is an investigation of girls' experiences studying science degree programmes at the University of Rwanda. Its aim was to explore the gendered constructions of science and how young women challenge these constructions in negotiating their way through university. To fulfil this aim, I was guided by three specific objectives, namely: i) tracing the background on gender and education in Rwanda since the pre-colonial period; ii) exploring the factors that influence young women's decisions to study science courses at university; and iii) exploring how some young women have challenged the gendered constructions for science at university in Rwanda.

The issues in this thesis have been presented in eight chapters. While Chapter One has provided a general background to this study, outlined the problem statement and articulated the main and specific objectives of the study, Chapter Two was concerned with the review of related literature. I have drawn on scholars' works on women and the study of science courses at university to establish the gaps that this study needed to fill. More so, by drawing

on cases from Rwanda, I have illuminated how different scholars have approached the gender question in science education. Besides, this chapter has also explored existing literature on gender issues in science in Africa with the intention of showing the trend of scholarship on gender issues in science as a means of understanding the context elsewhere. Finally, Chapter Two has brought to the fore literature on how young women have negotiated gendered constructions in science subjects with a view of informing the present study.

By providing the socio-cultural and economic context of Rwanda and the Rwandan society, this study has provided an understanding of how some women have been constructed in the Rwandan society. Among other issues, I have discussed the nature of education during pre-colonial, colonial, post-colonial (the period after independence) and the post-genocide Rwanda as a means of establishing how the education of women was conducted during these eras. As explicated in Chapter Three, I have also presented the different stages of education in Rwanda. This was intended to enhance an understanding of how these stages have influenced young women at university to study science subjects. This thesis has briefly examined the policies that are related to education to explore how the Government of Rwanda, in the aftermath of the 1994 genocide, has handled the question of providing opportunities to females right from primary school through secondary and onto colleges and universities.

Besides discussions on the context of education in Rwanda, as seen in Chapter Six, I have discussed the social and economic factors as part of the influences for gendering science at university. Specifically, this study has dealt with issues on how parents' education and income, the family structure, community expectations and domestic responsibilities influence young women to study science courses at university. Other factors discussed in relation to influences to girls' choice of science subjects include the complex relationship between marriage, schooling and career development. The study has also explored how the school acts as an institution whereby gender stereotypes can either be reinforced or resisted. I have demonstrated how society constructs women and men and how such constructions are related to their intellectual capabilities.

As presented in Chapter Seven, this study has discussed how young women have challenged gendered constructions of science subjects at university in Rwanda. Among the issues that have stood out in this chapter include i) science as subversion of femininity; ii) women using

science courses as a platform to build careers as opposed to creating families and homes; and; iii) the role of the government in ensuring that girls also study science courses at the university. The question of policies on admission, funding, teaching and learning are at the centre of discussions on how the government has participated in facilitating young women to negotiate gendered constructions in science at university. Furthermore, among other issues, the study has demonstrated how the pursuance of careers in science enhances women's efforts to subvert the cultural constructions of society.

Conducting this study also came with several limitations. As summarised in the following paragraphs, I had also to look for ways of mitigating such challenges so as to collect credible data.

8.3 Limitations of the Study

I selected the University of Rwanda's College of Science and Technology as a site for my research. Despite the many positive aspects of case study research, critics of this approach would consider the selection of a single case study ineffective because of its dependence on small samples, which are believed to render it incapable of generalising conclusions. However, like many other research approaches, a case study also involves a combination of methodological practices, empirical materials and perspectives in a study. The approach adds rigour, breadth, complexity, richness and depth to an inquiry. In other words, the case study approach is a credible strategy to be used in a research project. As I have pointed out in this study, my strength in using this research design lies in seeing this research not as an attempt to provide categorical truth about all the other institutions of learning in general, but an attempt to gain a deeper understanding about the experiences of young women taking degrees in science by studying a single case in detail.

In addition, some of the participants were not willing to take part in this study. Others who had agreed to take part in the study could drop out unexpectedly, while some of those who remained were not willing to talk in-depth about their lived experiences. To overcome the latter challenge, the researcher had to engage with the respondents over an extended period of time in order to establish rapport, which eventually made them open up and give details about their lives.

Furthermore, while the young women were always eager to participate in the research, some male students and male lecturers were suspicious of the aim of my research since it was about

women. They wondered what really, I was trying to find out about women studying science, thinking that I was creating some kind of inequality between girls and boys. They assumed that I was a feminist and that I had come to 'mislead' some of the girls in ways that I did not understand. Particularly, male lecturers reiterated that women's participation in sciences was not a problem. According to these lecturers, the main problem was poverty in the rural areas – suggesting that if all parents could afford the basic needs for their children, there would not be any inequality in education. To solve this problem, I drew on Keller's viewpoints to emphasise that "it's not women, I am learning about so much as men. Even more it is [about] science" (1985, p.172). In other words, how much knowledge does one have about women's experiences studying sciences, not just about efforts to go against the status quo.

Relatedly, having to share myself with the participants, a situation that collapses the power relations between the researcher and his/her participants, brought challenges of sometimes losing my identity as a researcher. As I mentioned earlier, when I conducted this study, I was not married and did not have any children. The fact that I had achieved 'a lot' academically and yet had 'failed' to fulfil my social obligations as a woman in the Rwandan society caused anxiety among my research participants. How does one attain a very high level of education and yet fail to fulfil what is required of her by society? Scholars conducting feminist studies need to be aware of such questions since the research participants tend to misunderstand the aims of the scholar. I had to explain to the young women participating in this study that it is good to get married and have children, but this can also come about after one first finishes school. I underscored the point of being patient and finishing school before engaging in other social responsibilities.

In relation to status, participants assumed that I was too 'expensive' to sit down and chat with them. They also thought that I only speak English, the language of 'high' class people and could not speak Kinyarwanda, the local language. I had to explain myself well in order to calm the fears of my respondents. While conducting fieldwork, I also had to allay the fears of my participants that I was not one of them; my position should not be a problem to them. They did not need to view anything I did from the lenses of the UK. I had to constantly interact with them during coffee and lunch breaks. As a result, I could tell them more about myself to enhance an understanding of my personality such that I do not appear to be a 'posh' woman from the UK who had come to take away 'their' information.

Lastly, I also anticipated the difficulty of understanding the researched because I am not a scientist myself. As I have already discussed in Chapter Four, some questions arise when a non-scientist conducts research about women in science. What do scientists experience – particularly women – which they may not be ready to reveal? How do you report research findings about science professionals? How are scientists taught and learn? I went into the field knowing that certain information may not be accessible since I could not get involved in some of the activities of the participants. Through constant interaction with the participants, I came to understand some of the issues that surround science teaching and learning as reported in this thesis.

8.4 Conclusions

Based on the discussions I have presented in Chapters Three, Five, Six and Seven, as well as the objectives that guided this study, the following conclusions can be made:

Firstly, the review of literature has revealed that little research in Rwanda has been done in the area of women in science, especially at university level. The research has established that most studies have analysed the nature of colonial education, issues of socio-cultural, economic and political factors that have affected women in their pursuit of their careers in science. These studies present huge gaps that needed to be filled by a study such as the one presented in this thesis. In this study, it has been revealed that society constructs women as physically and intellectually weak. As such, women are expected to study arts and social sciences, subjects, which resonate with their constructed roles in society. In this respect, women who have studied sciences up to university have persisted through numerous socio-cultural and economic conditions.

Similarly, the gap that is filled through this study relates to how the study of science subjects by young women at university becomes a platform for subverting the socio-cultural constructions about women. In other words, studying sciences has provided young women with a platform to reject the categorisation of public and private spaces where the former is associated with men and women are relegated to the latter. This divide between the public and private spheres is the handwork of colonialists, which has also been played out through education. By establishing boys' schools much earlier than the schools for girls, colonial masters pushed women to the periphery as they promoted the position of men in society. Thus, this precipitated in defining the roles and positions of both men and women through

elevating men to the public sphere and relegating women to the private one. Related to this issue is the question of the nature of subjects taught in both boys' and girls' schools. By establishing a curriculum that demanded that girls' schools teach such subjects as general hygiene, home economics and knitting, while on the other hand, boys studied bookkeeping and arithmetic, among other subjects, the study demonstrates that women and men were prepared to work in the home and public offices respectively. In conclusion, this study argues that, it is through studying sciences that these young women have transcended from the private space and entered the public one. In the public space, women are guaranteed with paid jobs, that help them to get economic independence and be elevated from a lower to a higher social status.

In addition, to young women using sciences as a means to transcend from private to public spaces, this shows that the GoR has championed gender equality in terms of education and employment. From enacting national policies on education and gender to ratifying regional and international treaties, the GoR has worked towards eliminating gender disparities in education, besides ensuring that women also access jobs. In spite of this progress, this study concludes that there remain deeply rooted gender stereotypes within the community and the home. Women are still looked at as people who should nurture life, keep homes and take care of men. In this regard, women are expected to study subjects, that resonate with their expected roles in society.

This study has also revealed that apart from some rural areas, there is some significant progress being made in primary and secondary schools in terms of gender equality. However, there is still gender inequality within higher education particularly in science. This state of affairs may stem from the fact that at lower levels of education, the GoR has enacted policies, which demand that all girls and boys attend school. On the other hand, there are no policies which call for compulsory education at tertiary level, particularly at university. Given that, scholarships to pursue university education are awarded to those who pass 'A' level exams with excellent grades, young women studying sciences at university are among the few people who excel at secondary school level.

I also conclude that the leadership and governance in post-genocide Rwanda has influenced young women to pursue careers in science. I have established that the young women who participated in this study looked at women leaders as people who can challenge the status quo

and become powerful figures in society. As such, they acted as role models to a number of women who joined the university to study science courses. Similarly, this study has revealed that the death of many men during the genocide left their wives and daughters to take up the roles of these deceased men. As can be inferred from this study, post – genocide Rwanda saw numerous women working as constructors or builders of roads, houses as well as becoming heads of families. This changed the perception of women’s roles in society thus motivating young women to opt for science subjects not only at secondary school level, but also at university.

8.5 Areas for Future Research

As this study has demonstrated, the government mainly relies on ‘A’ level grades to admit students to university. This limits the number of female students entering university considering the fact that they struggle through many socio-cultural and economic challenges. Because of the competitive nature of the scholarships, some female students end up sponsoring themselves. There is a need for a study exploring how these privately sponsored students perform in their areas of study. In other words, since they do not qualify for government sponsorship, do the private female students studying science at university perform well and complete their studies or not? Do they live up to their ambitions of becoming scientists?

Similarly, there is a need for a study on how the government can reconsider the funding policy for higher education. By basing on the *Ubudehe* categorisations to determine a student’s social class, one cannot get a true reflection of the social class categories of students. This makes it hard for bonafide students to benefit. Many poor students are left out and this affects their education and ambitions of becoming who they would want to be in the future. So how can the government fund university education with the aim of bringing on board more girls to study science?

Another important area that one can investigate relates to the post-university life of these female students. After completing their studies in science, it may be prudent for a researcher to investigate whether these young women continue with their careers in science or they embark on something else. Among the questions to investigate include; what motivates university women graduates to embark on other careers, leaving what they previously studied? What is the impact of such shifts to the government and other stakeholders who

invest in such students? Furthermore, one can conduct a comparative study between the experiences of young women studying science courses at university in a country like Rwanda and with those in another country. This can be a neighbouring country such as Burundi, Tanzania, Uganda, DRC or Kenya. Such a study may expose the scholar to different contexts in which young women study and how these contexts shape the nature of science careers they pursue later in life.

Lastly, due to the time and resource limitations, this study was based on interviews with participants. The researcher used a case study approach to conduct an in-depth analysis of young women's experiences of studying science subjects at university. However, there is a need to deeply study the culture of the university in terms of the teaching and learning process where one attends the lectures and to explore the relationship between lecturers and students for a detailed understanding of these gendered constructions.

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Appendices

Appendix 1: Identity of the Participants

Identity of participants	Age	Sex	Designation	School	Subject offered	Year of Study	Marital Status
Brenda	23	Female	Student	Architecture and the Built Environment	Estate Management and Evaluation	3 rd Year	Single
Nelly	20	Female	Student	Architecture and the Built Environment	Construction Management	2 nd Year	Single
Janet	21	Female	Student	Engineering	Water and Environmental Engineering	1 st Year	Single
Belinda	25	Female	Student	Sciences	Food Science and Technology	1 st Year	Single
Claudine	25	Female	Student	Sciences	Biology	2 nd Year	Married
Judith	28	Female	Student	Sciences	Biology	2 nd Year	Married
Christine	22	Female	Student	Sciences	Biology	3 rd Year	Single
George	26	Male	Student	Architecture and the Built Environment	Construction Management	2 nd Year	Single
Eric	21	Male	Student	Sciences	Mathematics	1 st Year	Single
Paul	45	Male	Lecturer	Sciences			Married
David	47	Male	Lecturer	Engineering			Married
John	69	Male	Parent				Married
Peter	50	Male	Parent				Married

Appendix 2: Participant Consent Forms



CONSENT FORM

Title of Project: On becoming a young woman scientist at university:
Constructions of self, identity and gender

Name of Researcher: Dorothy Tukahabwa

Contact details:

Address:

Canterbury Christ Church University Canterbury, Kent CT1 1QU
--

Tel:

--

Email:

--

Please initial

box

1. I confirm that I have read and understand the information sheet for the above study and have had the opportunity to ask questions.
2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason.
3. I understand that any personal information that I provide to the researchers will be kept strictly confidential

4. I agree to take part in the above study.

Name of Participant Date Signature

Name of Person taking consent Date Signature
(if different from researcher)

Dorothy Tukahabwa _____
Researcher Date Signature

PARTICIPANT INFORMATION SHEET



TITLE OF RESEARCH PROJECT

On Becoming a Young Woman Scientist at University in Rwanda: Constructions of Self, Identity and Gender.

Background

A research study is being conducted at Kigali Institute of Science and Technology (KIST) by Dorothy Tukahabwa, a PhD student at Canterbury Christ Church University, UK. I am keen to explore the experiences of young women studying for science degrees (a traditionally masculine discipline). I also want to examine the extent to which women feel their engagement with science may have challenged traditional understandings of gender and how this has manifested itself.

To participate in this research you must either:

- Be a student at the Kigali Institute of Science and technology.
- Be offering a science course at the university.
- Be teaching at the university.
- Be a parent with children at the university.

What will you be required to do?

I am extremely flexible and your involvement in the study will vary according to the time you have available. I would like to speak with female and male students, lectures and parents either on a one to one basis. I will also ask if some of the female participants would be willing to write a diary or document about some aspects of their lives related to the study.

How will the research be conducted

I am able to speak to you in English or Kinyarwanda, and ideally, the interviews will last between one hour and two hours (or less if that is all you can spare). I will be having some questions to guide the interviews but you are free to choose the questions and decide on what

to be discussed during the interview process. I will also share with you my experiences at particular moments during the interview.

What I would like to find out through this study

In this study, I am interested in the experiences of the women in making their way through the university. This study is important because past research has reported on the low level of entry of females into scientific degrees, yet there are a few young women who have managed to make it to university. Examining factors like parents' and teachers' attitudes towards female students who have taken on degrees in science may provide insight into the learning journey of the female students with hopes of having more women take on science degrees.

Deciding whether to participate

Participation in this research is voluntary and you are free to leave the study at any time. When you agree to participate, you can still drop out at any time without giving any reasons. You will be given a pseudonym and I will never reveal your name in any of my research writings. You will be sent copies of the recorded interviews in order to make any changes.

Any questions?

Should you have any questions, Please contact Dorothy Tukahabwa at the following email address: dt157@canterbury.ac.uk

Appendix 3: Sample Interview Guide

Social Background

- Can you please tell me something about yourself? (such as: your age, your marital status, if you have parents, siblings, relatives, place of birth, how you spend your leisure time)
- Can you please tell me something more about your family (that is, the occupation of your parents, their educational background, economic status)?
- Can you please tell me something about your educational background?
- What was your experience of schooling?
- Did you have any subject preference at primary and secondary school? If yes which subjects did you like most and why?
- Were there any subjects you didn't like? If yes, why?

Social relationships

- Do your parents play any role in your education previously and at the moment, in what way? (e.g. helping in your homework, attending school meetings, requesting extra classes, helping to decide which courses to take).
- Were you able to make a choice for studying a particular programme without parents' consent or without consulting parents? If yes, why?
- Do you have other experiences at home or school or neighbourhood that has had significant influence on your choice of study?

Young women as science students

- Can you talk to me about your experience of studying science as a woman?
- Would you say that you enjoy it, generally speaking? If yes, what makes you enjoy it?
- Are you able to talk in some detail about some of the elements you find less enjoyable?
- Are you happy with your decision to study this subject and to study at this point in time – do you have any regrets or are there any things you would do differently?
- Do you have any preference for a particular science subject? And if yes, which and why?

- Are you able to talk a little about how you feel males perceive you and other females who are studying sciences? What has been your experience of this and has this influenced you in any way? What do boys think about you doing sciences?
- Are there any ways in which you feel the female students support one another in coping with the challenges of studying science?
- What are the concerns that you have faced in pursuit of studying science? If any what are the coping strategies?
- Given your own experiences, if you were to have children of your own in the future, is there any advice you would give them in relation to their education? What would you want for them in terms of education?

Appendix 4: Ethical Approval from CCCU



11 July 2013

Ref: 13/EDU/CL33

Ms Dorothy Tukahabwa
Centre for Children, Families and Communities

Dear Dorothy

Confirmation of ethics compliance for your study "*On becoming a young woman scientist at university in Rwanda: constructions of self, identity and gender.*"

I have received a completed and countersigned Ethics Review Checklist dated 9 July 2013 for the above project. Because you have answered "No" to all of the questions in Section B of the form, no further ethical review will be required under the terms of this University's Research Ethics and Governance Procedures.

In confirming compliance for your study, I must remind you that it is your responsibility to follow, as appropriate, the policies and procedures set out in the *Research Governance Handbook* (<http://www.canterbury.ac.uk/Research/GovernanceandEthics/GovernanceAndEthics.aspx>) and any relevant academic or professional guidelines. This includes providing, if appropriate, information sheets and consent forms, and ensuring confidentiality in the storage and use of data. Any significant change in the question, design or conduct of the study over its course should be notified to the **Research Office**, and may require a new application for ethics approval. [You are also required to inform me once your research has been completed.](#)

Wishing you every success with your research.

Yours sincerely

A handwritten signature in black ink that reads "Roger Bone".

Roger Bone
Research Governance Manager
Tel: +44 (0)1227 782940 ext 3272 (enter at prompt)
Email: roger.bone@canterbury.ac.uk

cc: Dr Ruth Rogers

Research Office
Research and Enterprise Development Centre

Canterbury Christ Church University
North Holmes Campus, Canterbury, Kent, CT1 1QU
Tel +44 (0)1227 767700 Fax +44 (0)1227 470442
www.canterbury.ac.uk

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Appendix 5: Letter of Affiliation to the University of Rwanda



The Rector
Kigali Institute of Science and Technology
B.P. 3900
Kigali, Rwanda

Dear Dr Marie Christine Gasingirwa,

Re: Request to be affiliated to KIST to conduct research

I am Dorothy Tukahabwa from Rwanda and currently a first year doctoral student in the Faculty of Education at Canterbury Christ Church University (UK). As part of the requirements for my program, I am undertaking a research project entitled: *On becoming a young woman scientist at university: Constructions of the self, identity and gender in Rwanda* to explore the voices and identities of women pursuing science courses at universities and have selected Kigali Institute of Science and Technology (KIST) as a case study.

As it is in many other African countries, and in Rwanda, young women in science remain significantly underrepresented in higher education. But still, there are a few young women who have managed to make it to university to pursue science courses. As such, I want to understand how these young women construct their own life story to make their way through higher education. I am hoping to conduct interviews with young women to share their experiences and views on women studying science at the university. I will also interview male students, relevant teaching staff, and parents to explore their perception towards female students who have taken on degrees in science (I attach a participant information sheet summarising the nature of the research).

The purpose of this letter is to request for contribution towards this research. I particularly request your permission to talk to the students, academic staff and to access information on

policy documents to do with admission, learning and teaching process, assessment strategies and the equality and diversity policy in order to gather data for my study.

I also request for your support in facilitating a meeting to enable me formally meet and interact with not only the female and male students but also lecturers that will provide data for this study. However, given the nature of this research, I would prefer to meet with you in person to discuss what I intend to do in more details.

I appreciate that this research raises specific ethical issues, especially as relates to informed consent of the participants. I can assure you that the project is being thoroughly scrutinised by the Canterbury Christ Church University's internal ethics committee. As such, I pledge to employ best ethical practices in terms of informed consent, confidentiality and anonymity, and elimination of harm for all those who choose to participate. If you have any questions, please do not hesitate to contact me.

Looking forward for your positive response

Yours sincerely,

Dorothy Tukahabwa

PhD Student (Education)

Canterbury Christ Church University

United Kingdom

CT1 1QU

Appendix 6: Letter of Nomination for the Contact Person at the University

KIGALI INSTITUTE OF SCIENCE AND TECHNOLOGY
INSTITUT DES SCIENCES ET DE TECHNOLOGIE DE KIGALI



OFFICE OF THE RECTOR

Avenue de l'Armée, B. P. 3900 Kigali Rwanda
Tel: +250 574696/514777
Fax: +250 571925/571924
Email: rector@kist.ac.rw
Website: www.kist.ac.rw

19th September 2013

**Ag. Director General of Science, Technology and Research
Ministry of Education
P.O Box 622
Kigali-Rwanda**

Dear Sir:

**Re: Nomination of Dr. Hilda Vasanthakalam as contact person in relation to Ms
Dorothy TUKAHABWA's affiliation**

Ms Dorothy TUKAHABWA requested for affiliation to Kigali Institute of Science and Technology (KIST) while conducting a research entitled "On becoming a young woman scientist at university: Constructions of the self, identity and gender in Rwanda".

I am pleased to inform you that KIST Management has nominated Dr. Hilda Vasanthakalam, Head of Food Science and Technology Department, as the contact person to follow up Ms. Dorothy TUKAHABWA during her research period as an affiliate of Kigali Institute of Science and Technology. The appointment will take effect upon approval of Ms. Dorothy TUKAHABWA's request by the Ministry of Education.

Yours sincerely,



**Dr. Marie-Christine GASINGIRWA
Acting Rector**

CC:

- Hon. Minister of Education
- Director Postgraduate Studies, Research and Consultation
- Dr.Hilda Vasanthakalam

T O W A R D S A B R I G H T E R F U T U R E

Appendix 7: Letter of Authorisation from Ministry of Education to Conduct Research

REPUBLIC OF RWANDA

Kigali, 25/09/2013.
Ref: 24.85/12.00/2013



MINISTRY OF EDUCATION
P.O BOX 622 KIGALI



Re: Permission to carry out research in Rwanda - No: MINEDUC/S&T/0161/2013

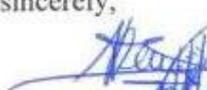
Permission is hereby granted to Ms. TUKAHABWA Dorothy, a PhD student in Faculty of Education at Canterbury Christ Church University (UK) to carry out research on: **On becoming a young woman scientist at university: Constructions of the self, identity and gender in Rwanda "**.

The research will be conducted in Nyarugenge District, Kigali City. She will interview the relevant teaching staff, Students and parents of the students at KIST. She will need access to the annual reports of KIST, Education and Gender Policies, Learning and teaching Policies, assessment and equality diversity Policy.

The period of research is **from 25th, September, 2013 to 30th, October, 2014**. This period may be renewed if necessary, in which case a new permission will be sought by the researcher.

Please provide Ms. TUKAHABWA Dorothy any support she may require in the course of conducting this research.

Yours sincerely,


TWIRINGIYIMANA Remy
Acting Director General
Science, Technology and Research
Ministry of Education



Appendix 8: Letter of Authorisation from Ministry of Education (including names of contact person with copy to the Minister of Education)

REPUBLIC OF RWANDA

Kigali, 25/09/2013
Réf. N° 24.86...../12.00/2013



MINISTRY OF EDUCATION
P.O.BOX 622 KIGALI

Ms. TUKAHABWA Dorothy
PhD student (Education)
Canterbury Christ Church University
United Kingdom
E-mail: dorahstia@yahoo.com
Tel: +250788663963

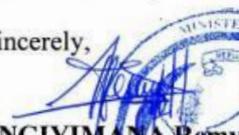
RE: Approval to conduct research in Rwanda under the project titled “On becoming a young woman scientist at university: Constructions of the self, identity and gender in Rwanda”.

I am pleased to attach a copy of research clearance which has been granted to you to conduct research on the above project title.

I wish to remind you that the research permit number should be cited in your final research report. The research should be carried out under affiliation of Kigali Institute of Science and Technology-KIST under supervision of Dr.Hilda Vasanthakalam, head of Food Science and Technology Department. A copy of the final research report will be given to the Ministry of Education of Rwanda.

I wish you success in your research.

Yours sincerely,


TWIRINGIYIMANA Remy
Acting Director General
Science, Technology and Research
Ministry of Education

Cc.

- Honorable Minister of Education
- Honorable Minister of State in Charge of Primary and Secondary Education
- Honorable Minister of State in Charge of TVET
- Permanent Secretary, Ministry of Education
- Advisor, Science and Technology, Ministry of Education
- Dr.Hilda Vasanthakalam, KIST

Appendix 9: Letter to Introduce the Researcher to the University



**University of Rwanda
College of Science and Technology**

INTER OFFICE MEMO

To: Academic Registrar
Dean
Director
HOD
Head of Unit
Academic Quality Assurance Officer

From: The In-Charge of Academics (Former Ag. VRA), UR-Kigali Campus

Signature:



Cc: -Coordinator, UR-Kigali Campus (Former Rector)
-CBM (former VRA)

Date: 22nd October 2013

Subject: Introducing Researcher Dorothy Tukahabwa

To Whom This May Apply

This note serves to introduce Ms Dorothy Tukahabwa, a PhD student at Canterbury Christ Church University, UK, who has been formally granted permission by the Ministry of Education and the KIST Management to conduct her research here at this College. Her research topic is as follows: **On becoming a Young Woman Scientist at University: Constructions of the Self, Identity, and Gender in Rwanda**. She may come to your office requesting for certain documents as potential resource materials for information. Kindly avail them to her and assist her find a place where she can sit while she is consulting the documents. MsTukahabwa is aware that no official KIST document is allowed to leave the campus premises.

Any assistance accorded her will be most appreciated. Thank you.