University Education for the Creation of the Black Middle Class: Kigali, Rwanda

Chrystina L. Russell

The Graduate Center, City University of New York

How does access to this work benefit you? Let us know!
Follow this and additional works at: https://academicworks.cuny.edu/gc_etds

Part of the Higher Education Commons, Humane Education Commons, International and Comparative Education Commons, and the Online and Distance Education Commons

Recommended Citation
Russell, Chrystina L., "University Education for the Creation of the Black Middle Class: Kigali, Rwanda" (2017). CUNY Academic Works.
https://academicworks.cuny.edu/gc_etds/2018

This Dissertation is brought to you by CUNY Academic Works. It has been accepted for inclusion in All Dissertations, Theses, and Capstone Projects by an authorized administrator of CUNY Academic Works. For more information, please contact deposit@gc.cuny.edu.
UNIVERSITY EDUCATION FOR THE CREATION OF THE BLACK MIDDLE CLASS: KIGALI, RWANDA

by

CHRYSTINA RUSSELL

A dissertation submitted to the Graduate Faculty in Urban Education in partial fulfillment of the requirements for the degree of Doctor of Philosophy, The City University of New York

2017
University Education for the Creation of the Black Middle Class:
Kigali, Rwanda

by

Chrystina Russell

This manuscript has been read and accepted for the Graduate Faculty in Urban Education in satisfaction of the dissertation requirement for the degree of Doctor of Philosophy.

Date
Juan Battle
Chair of Examining Committee

Date
Anthony Picciano
Executive Officer

Supervisory Committee:
Stephen Brier
Anthony Picciano

THE CITY UNIVERSITY OF NEW YORK
ABSTRACT

University Education for the Creation of the Black Middle Class: Kigali, Rwanda

by

Chrystina Russell

Advisor: Juan Battle

Drawing on theories documenting the advantages and disadvantages of the growing Black middle class, this dissertation examines how higher education functions in creating a middle-class citizenry in developing countries. The underlying premise of this dissertation is understanding how technology and education operate in tandem to simultaneously alleviate and perpetuate economic as well as social inequalities. Therefore, this project will contribute to research on the growing Black middle class in the developing world, and will offer insight into a “blueprint” of how technology and education operate in tandem.

This dissertation is a case study—employing mixed methods (quantitative and qualitative) approaches—examination of Kepler, a new, innovative university in Kigali, Rwanda. The quantitative data includes performance on three academic tests. A series of statistical analyses was conducted to highlight how the key variables function differently for multiple types of students (e.g., males vs. females). A thorough case study of Kepler highlights how technology is utilized and thus impacts educational outcomes. Direct observations and interviews will be utilized to understand the educational experiences and outcomes of students at Kepler.

Anyon’s neo-Marxist theories of work, class, gender, and the political economy, Bourdieu’s theories on multiple forms of capital and language as a mechanism of power, bell hook’s feminist perspectives, and Fanon’s post-colonial theories serve as the theoretical
framework for this dissertation. The findings from this study will help to inform educators, policymakers, as well as local, national, and international NGOs invested in better understanding the link between development, education, and nation building.
ACKNOWLEDGEMENTS

For Jean who got me started, Juan who made sure I finished,

and

all the other Jean- and Juan-esque educators out there who’ve given the time, dedication, and love required to ensure their students become better thinkers, people, and world changers.
# Table of Contents

ABSTRACT .............................................................................................................................. iv  
LIST OF FIGURES AND TABLES ............................................................................................ x  

## CHAPTER 1: Introduction and Background ................................................................. 1  
  Introduction ....................................................................................................................... 1  
  Statement of the Problem ............................................................................................... 3  
  Rationale ......................................................................................................................... 3  
  Contribution to the Field ............................................................................................... 4  
  Background .................................................................................................................... 5  
  Theoretical Framework ................................................................................................. 5  

### Literature Review ........................................................................................................ 8  
  Gender ............................................................................................................................ 8  
  Urbanicity ...................................................................................................................... 9  
  Poverty ........................................................................................................................... 10  
  Age ................................................................................................................................ 10  
  Black Middle Class ....................................................................................................... 11  
  Black Middle Class ....................................................................................................... 13  
  Black Middle Class in Rwanda, and Clarifying the Definition of Black Middle Class for this  
  Dissertation ................................................................................................................... 14  
  Education in the Developing World ............................................................................... 16  
  Blended Learning ......................................................................................................... 17  

### Methodology ................................................................................................................ 18  
  Data ............................................................................................................................... 19  
  Quantitative Analysis ................................................................................................... 19  
  Dependent Variables .................................................................................................... 20  
  Independent Variables ................................................................................................. 21  
  Qualitative Analysis ...................................................................................................... 22  
  Interviews ..................................................................................................................... 23  

### Participant Observation ............................................................................................. 23  
  Analysis .......................................................................................................................... 23  

### Overview of Kepler .................................................................................................... 24  

#### Kepler Kigali Academic Overview ........................................................................ 24  
  Kepler Kigali Partnerships Overview .......................................................................... 31  
  Kepler Kigali Internships & Jobs Overview .................................................................. 33  
  Kepler Kigali Student Services Overview .................................................................... 34  
  Kepler Kigali Admissions and Financial Aid Overview ............................................... 35  
  Kepler Kigali Staffing and Professional Development Overview .................................. 36  
  Kepler Kigali Self-Evaluation and Learning Overview .................................................. 37  
  Kepler Kiziba General Overview .................................................................................. 39  
  An Overview of Kepler Kiziba Academics .................................................................. 39  
  Kepler Kiziba Partnerships Overview .......................................................................... 40  
  Kepler Kiziba Student Services Overview ................................................................... 40
An Overview of Kepler Kiziba Staffing and Professional Development ........................................41
An Overview of Kepler Kiziba Jobs and Internships .................................................................41
An Overview of Kepler Kiziba Admissions and Financial Aid ..................................................41

Chapter 2: THEORETICAL FRAMEWORK & LITERATURE REVIEW ........................................43
Theoretical Framework .............................................................................................................43
Literature Review ......................................................................................................................47
  Gender ..................................................................................................................................48
  Urbanicity .............................................................................................................................51

Rwanda ....................................................................................................................................54
  Poverty ..................................................................................................................................55
  Age .......................................................................................................................................58
  Black Middle Class ................................................................................................................59
  The Black Middle Class in the Developing World ................................................................62
  Education in the Developing World .......................................................................................63
  Higher Education in Rwanda ..................................................................................................66
  Blended Learning ...................................................................................................................69

Chapter 3: METHODOLOGY ....................................................................................................71
  Researcher Background .........................................................................................................71
  Rwanda Overview ..................................................................................................................75
  Summary of Primary, Secondary and Post-Secondary Education in Rwanda .........................79
  Summary of the Current Structure and Function of the Rwandan Economy .........................80
  Case Study .............................................................................................................................82
  Data .......................................................................................................................................86
  Quantitative Analysis Summary ............................................................................................86
  Dependent Variables .............................................................................................................87
  Independent Variables ..........................................................................................................87
  Qualitative Analysis ..............................................................................................................90
  Direct Observations ..............................................................................................................90
  Interviews .............................................................................................................................90
  Participant Observation ..........................................................................................................91

CHAPTER 4: FINDINGS .............................................................................................................93
  Chapter 4a: IDinsight quantitative data findings ....................................................................93
  Overview of the IDinsight Quantitative Study .......................................................................94
    Dependent Variables ...........................................................................................................95
    Independent Variables .......................................................................................................100

Males .......................................................................................................................................101
  Chapter 4b: IDinsight qualitative data ....................................................................................126
    What Kepler Needs to Improve: Females .............................................................................146
  Chapter 4c: Ethnographic data findings .................................................................................159
    Recruiting and Admissions .................................................................................................160
    Student Housing ................................................................................................................162
    The Nexus between Kepler and Employers .......................................................................163
    Provision of Monetary and Non-Academic Services ..........................................................166
    Student Age in the Kepler University Program ....................................................................168
    Student Poverty Status at Kepler .......................................................................................169
    Academic Performance Before Entering Kepler ..................................................................169
    Observations of Kepler and Other Universities .................................................................170
LIST OF FIGURES AND TABLES

Figure 1  Research Genealogy  47

Table 1A  Adjusted Means, Standard Deviations, and Ranges for Treatment Students  98
Table 1B  Adjusted Means, Standard Deviations, and Ranges for Comparison Students  99
Table 1C  Comparison of Means on Respondent in Treatment by Independent Variable  100
Table 2A  Adjusted Means, Standard Deviations, and Ranges for Male Treatment Students  102
Table 2B  Adjusted Means, Standard Deviations, and Ranges for Male Comparison Students  103
Table 2C  Comparison of Means on Male Respondents in Treatment by Independent Variable  104
Table 3A  Adjusted Means, Standard Deviations, and Ranges for Female Treatment Students  106
Table 3B  Adjusted Means, Standard Deviations, and Ranges for Female Comparison Students  107
Table 3C  Comparison of Means on Female Respondents in Treatment by Independent Variable  108
Table 4A  Adjusted Means, Standard Deviations, and Ranges for Urban Treatment Students  110
Table 4B  Adjusted Means, Standard Deviations, and Ranges for Urban Comparison Students  111
Table 4C  Comparison of Means on Urban Respondents in Treatment by Independent Variable  112
Table 5A  Adjusted Means, Standard Deviations, and Ranges for Rural Treatment Students  114
Table 5B  Adjusted Means, Standard Deviations, and Ranges for Rural Comparison Students  115
Table 5C  Comparison of Means on Rural Respondents in Treatment by Independent Variable  116
Table 6A  Means, Standard Deviations of Scores by Poverty Subgroup  119
Table 6B  Comparison of Scores by Poverty Subgroup  120–21
Table 7A  Means, Standard Deviations of Scores by Age Subgroup  123
Table 7B  Comparison of Scores by Age Subgroup  124–25
CHAPTER 1: Introduction and Background

This chapter will give an overview of this dissertation, Rwanda, and the Kepler program. This discussion includes the reasons for the study and what the dissertation will contribute to the field. A background of both Rwanda and the Kepler program is given to ensure readers have appropriate context for the study. It is important for readers to note the author served as the Chief Academic Officer of Kepler from 2013-2016, which is briefly mentioned in this chapter and described in-depth in Chapter 3 in the “researcher background” section.

Introduction

Currently, there are the 200 million young people living in Africa facing a common problem: there is no pathway to transition from secondary school to productive employment. Kepler was created to address this issue. With a population growing more rapidly than anywhere else in the world, the scale of young people without access to education makes the education-to-employment crisis one of the defining issues currently facing both Rwanda and the entire African continent. Without dramatic improvement in both quality and accessibility in Rwanda’s higher education system, any further poverty reduction will remain illusory, while millions of young secondary school graduates will continue to be greeted by unemployment and a lifetime of diminished expectations.

At the national level, growing African countries like Rwanda are confronted by a lack of human capital to fill positions that require skilled knowledge workers. Local universities, inaccessible to all but the elite, lack the capacity to train a sufficient quantity of engineers, programmers, statisticians, accountants, teachers, agribusiness entrepreneurs, civil servants, and other skilled positions that comprise the backbone of modern economies. If countries like Rwanda are to continue their impressive growth through modern service-based economies, their young
people must have access to institutions that train them for relevant careers at a price students can afford. Kepler was founded in 2013 with the goal of developing a scalable, comprehensive, and sustainable solution to this crisis. Kepler’s educational model—online content delivery combined with rigorous in-person facilitation, on-the-job learning, and professional skills training—is currently developing with financial support from a few private donors and the IKEA Foundation. Kepler has an innovative partnership with Southern New Hampshire University, which enables the University program to deliver an accredited degree from the United States. Students earn the degree through a competency-based approach, meaning that they demonstrate competencies through the completion of projects to graduate rather than credits through seat time and examinations. The campus is working to optimize the impact, scalability, and sustainability of this blended learning approach to higher education without sacrificing quality for cost. Early evidence shows students are eager for the model: Kepler received thousands of applications for the Kigali campus’s inaugural class of 50 students before the model was even proven or a campus existed. Kepler has enrollment has increased considerably from 2013. In 2014, the Kigali campus accepted 100 new students. In 2015, the class size was 150, and the program opened a second campus in Kiziba refugee camp, offering 25 students the program from within the camp. The camp serves Congolese refugees who have been living in Kiziba for the past 20 years. Additionally, Kepler opened applications to Burundian and Ugandan students in 2014 (Burundians comprise about 4% of the student population) and Congolese students in Goma in 2016. The program intends to grow internationally by expanding recruitment in Bukavu, Democratic Republic of Congo, in 2017. In 2016, Kepler received approximately 7,000 applications for 175 seats, 150 on the Kigali campus and 25 in Kiziba refugee camp located in Western Rwanda. The following sections will outline
Kepler’s major programmatic features for both the Kigali and Kiziba campuses, including the growth and change in the program from its inception.

**Statement of the Problem**

While researchers have begun to examine the Black middle class in developing countries, few have explored the link between innovation in higher education and the formation of a middle class in developing countries. As globalization and technology affect the world of work and school, universities may function to both promote and undermine inequality, but these contradictory forces have been little studied in the developing world. This dissertation investigates how higher education functions in creating a middle-class citizenry in developing countries. Student outcomes from a higher education “blended” (in-person and online) learning model will be examined in Kigali, Rwanda. I will also examine how the model contributes to Black middle-class growth in the developing world and offer a blueprint of how, in tandem, technology, education, and innovation alleviate or perpetuate inequalities.

**Rationale**

In developed countries, the study of the emerging Black middle class has often been on the fringe of scholarship (Landry & Marsh, 2011), and in developing countries, it has even been less studied. In the limited cases of studies about upward mobility, studies of the Black middle class tend to focus on countries with economies that are much further advanced—such as South Africa—than some of the world’s poorest nations (Burger, Steenekamp, Van der Berg, & Zoch, 2014).

However, a recent study by the UNDP entitled, “The Rise of the South” (2013) noted many countries that are currently better known for poverty are rapidly moving forward economically and socially. Among countries with the most rapid growth in terms of increasing GDP is Rwanda, with
about 40 other countries showing similar profiles. Several of those countries, including among the poorest at the present time, are Rwanda, Tunisia, Ghana, and Mauritius. The UNDP study also noted that by 2025, almost 1 billion households will earn $20,000 or more a year.

With rapid advances towards the creation of a middle class in currently poor countries, it is essential to understand both the perils and privileges that accompany such movement. This is particularly important because global inequality has been a longstanding issue. From major economic crises in 1987 and again in 2008, developing countries often suffer more from these downturns than developed countries. Therefore, while several economies are rapidly creating expanding middle classes, those entering the middle classes may find their standing insecure.

The middle class, however, is not just about income, and it is especially not well measured by income alone in developing countries (Burger et al., 2014). Factors such as social capital and the ability to control one’s future are particularly important to understand in developing countries. Understanding how income and sources of capital intertwine in the creation of the middle class is important to alleviating global inequality. The definition of middle class for the purposes of this dissertation is explored in later in this chapter under the “Black Middle Class” section.

To analyze how institutions of higher education function in creating a developing country’s middle class, this dissertation focuses on Rwanda because it is rapidly creating a large middle class (UNDP 2013). Within Rwanda, I concentrate on Kepler because it is new, is using technology to enhance education, and specifically attracts poor students that aspire to move into the middle class upon graduation.

**Contribution to the Field**

There is currently a dearth of research on the Black middle class, and the vast majority is
concentrated on the United States or other developed countries. This study will add to the small amount of research done on the Black middle class in Africa by examining the role of innovations in university education. This study will contribute to the field by informing educators and policymakers, as well as local, national, and international NGOs interested in better understanding the link between development, education, and nation building.

**Background**

This study will explore how innovations in university education lead to Black middle class formation in a developing country. A significant body of literature in the fields of international education, class studies, blended learning, class and educational attainment, and the state of sub-Saharan Africa set the stage for understanding how an innovative model in tertiary education may contribute to the perpetuation or alleviation of social inequalities in the formation of a Black middle class. This dissertation’s theoretical framework will draw especially on the neo-Marxist theories of Anyon, and Bourdieu in the field of education and the economy, as well as feminist and post-colonialist theories.

**Theoretical Framework**

This dissertation is guided by a theoretical framework composed of four interrelated theories, the first of which is a subset of theories of education and the economy. Scholars have long connected schools to the creation of class. In particular, the connections between schooling and the creation of economic classes are explained by Marxist and ne-Marxist theory (Marx & Engels, 1970; Bowles & Gintis, 1976; Giroux, 1983). Marx articulated a creation of social classes as a result of struggles between the bourgeoisie, which owns the means of production, and the proletariat, which has only its labor to sell. The innately conflictual nature of their relationship is reflected in social structures and institutions throughout society. Institutions of education often
serve to replicate social classes and roles in society (Apple & Jungck, 1990).

Following Marx, many neo theorists have challenged the idea that school is a ticket out of poverty (Bowles & Gintis, 1976), explaining that acts of schooling are never neutral. Instead, schools are places of indoctrination and are inexorably tied to the creation of classes and positions within society (Apple & Jungck, 1990). Bowles and Gintis’s “correspondence theory,” which argues that schools serve as places of social reproduction, will be utilized to understand how universities do and do not meet the needs of students when trying to create a middle class. In particular, the notion of school hierarchy and how it serves to prepare “workers” will be described. Additionally, Gramsci’s (1971) concept of ideological hegemony, or schools functioning as places of normalizing the ruling class and its cultural habits, will also provide a theoretical framework for this dissertation.

Jean Anyon (2011) directly addressed the connections between Marx and schooling. She notes that since the time of Marx, there have been several neo-Marxist theorists (including Bowles & Gintis, Gramsci, and Apple among others) that have understood the classroom and the inequalities it maintains and produces within and outside of school walls. She is particularly critical of the common practice in the United States to blame educators for the failures of schools and the broader economy. She rejects this blaming and insists that school reform has to be a part of more comprehensive economic policies that include wages, adequate job training, and access to jobs. Rather than creating the broad economic and social reforms that are required for greater equality, Anyon argues that critics avoid needed changes by blaming schools. This dissertation will use the theoretical frameworks connecting neo-Marxism and education to understand the ways in which institutions of higher education enable and obstruct entry into the middle class.
Although the neo-Marxist theories of education provide a relevant framework for this dissertation, the philosophies of Pierre Bourdieu will add insight into the ways in which higher education functions to create a middle class. While neo-Marxism focuses heavily on production and capital as a means to belong to the powerful or powerless classes, Bourdieu, in “The Forms of Capital” (1986), also considers multiple forms of capital beyond the purely economic. For Bourdieu, cultural capital refers to the advantages, knowledge, and schooling that one possesses in order to access different classes and status positions in society. While some forms of cultural capital are gained in school, Bourdieu maintained that most forms of cultural capital are derived from family life. Social capital refers to the networks, relationships, memberships in organization, and connections individuals have that enable them to maintain their class status. It also dictates behavior within classes, as well as how they relate to one another. The concepts of cultural and social capital will be considered as theoretical frameworks for understanding how forms of capital are manifested in institutions of higher education.

In Language and Symbolic Power (1991) Bourdieu argues language is not just a means of communication but also a mechanism of power. As universities in developing countries choose an instruction language, they often opt for the colonizers’ language over the native tongue, revealing how language and class intertwine.

Additionally, because the progress of developing nations is directly related to the education of women, feminist theory will be considered to understand how institutions of higher education encourage the creation of a middle class. bell hooks’s Feminist Theory: From Margin to Center (1984) describes how marginalized voices are often not included in education. She, instead, encourages women to advocate for themselves and recognize and appreciate their differences. A pioneer in intersectionality, or the crossing of race, class, and gender, hooks notes that equality
requires men must be included in the feminist paradigm.

hooks focuses on the specifics of curriculum and power in *Teaching to Transgress: Education as the Practice of Freedom* (1994). Of particular note for this study, she advocates for a model of university teaching that increases the engagement of all students, particularly female students, through collaboration and relaxation.

Last, Frantz Fanon describes the impacts of colonialism on the Black psyche in his many works exploring how the hangover of racist phrenology is still present in modern day. Of particular interest for this dissertation is examining how Kepler may both alleviate and perpetuate inequality as it seeks to create an innovative institution contributing to the formation of the Black middle class as an American institution the Global South.

**Literature Review**

There are eight areas of study that provide background to the role of university education and the development of the middle class. These are: 1) gender and educational attainment, 2) urbanicity and educational attainment, 3) poverty and educational attainment, 4) age and educational attainment, 5) Black middle class, 6) Black middle class in the developing world, 7) education in the developing world, and 8) blended learning.

**Gender**

Gender is important in this study because of its relationship with class. Essentially, a positive correlation exists between girls engaging in school and improved rates of life expectancy and level of gross national product (World Bank, 2013). Despite the correlation, however, the literature demonstrates that there is a severe under enrollment and engagement of female students in sub-Saharan Africa. There are several complicated factors contributing to this phenomenon, including a lack of economic resources in families, an absence of the necessities for females once
menstruation begins in schools, family preference for sending male offspring to school, and the belief that marriage is the most important act in a woman’s life. In sheer labor terms, girls are required to do all household chores, fetch water, and take care of ailing family members in the home or in hospitals (Arnove, Torres, & Franz, 2012; Black Beeoku-Betts, & Tabachinick, 1998; George, 2016; Jejeebhoy, 1995; Manuh, 1998; Robertson, 1986; Schultz, 1993). In Rwanda and the majority of sub-Saharan Africa, a combination of social traditions, biases in families, women’s lack of access to economic empowerment, beliefs about a woman’s role in the community, and religious beliefs form an incredibly difficult environment for female students to excel in primary school, let alone make it to a tertiary educational program such as Kepler.

In Rwanda, girls continue to underachieve in comparison to their male peers in attendance, educational attainment, and basic enrollment. While these differences are observed at the primary school level, the disparity between male and female students grows as Rwandan women move into secondary and tertiary school levels. In essentially all aspects of education—from exam scores to college entrance—females lag males in Rwanda (Huggins & Randell, 2007).

**Urbanicity**

In sub-Saharan Africa and in Rwanda, in particular, rural student performance is drastically lower than that of urban students (Hayman, 2007). This gap, however, is not unique to low-income countries, and many studies have shown that the same problem exists in the United States and other high-income countries (Adelman, 2002). The cause of the disparity in performance has been long debated by scholars, with some looking at regional factors and others examining individualized student characteristics (Foster, 1997; Heyneman & Loxley, 1983; Ross & Zuze, 2004). These perspectives have been challenged ideologically as well as methodologically, and have created a robust discussion about the origins of and factors that contribute to disparities
between urban and rural students in both poor and wealthy countries.

In the Rwandan case, where Kepler Kigali is situated, the lag in rural academic achievement is comparable to countries across sub-Saharan Africa. The trend occurs from primary through secondary school and is similar to the disparity found in gender. It is particularly pronounced at the tertiary level (Hayman, 2007). Educational disparities found in Rwanda mean that rural students have fewer opportunities to contribute to the growth of a Black middle class.

**Poverty**

In both the United States and globally, it is well documented that poverty is correlated with negative social engagement and academic achievement in school (Engle & Black, 2008). Beyond social and academic impacts, poverty is also tied to increased anxiety in school, health problems, and an increased chance of being placed in special education (Brooks-Gunn & Duncan, 1997). These findings are also found in the African context, but are exacerbated by frequent ethnic, religious, and social conflicts which increased numbers of orphans because of health and safety related issues, restricted resources from the familial to governmental levels, a growth in the number of refugees, and extreme poverty (Hyde, 1993).

The literature on Rwanda outlines the same learning outcomes for impoverished children, but these outcomes were even further complicated by the 1994 genocide, where schools were destroyed, thousands of teachers’ lives and knowledge were lost, orphans proliferated, counseling and health care were non-existent, and school closures even further delayed learning among poor children (Hayman, 2005).

**Age**

In university education, there is a body of research correlating student age with increased academic performance. Most of this research finds that the older a student is, the better he or she
will do in earning high grades in college (Gramlich & Greenlee, 1993). Much of this research, however, is based on Western societies, and there is a dearth of literature on age and its relationship with academic achievement in developing countries. Therefore, this study will contribute to understanding how age affects university education and the creation of a Black middle class.

**Black Middle Class**

There is a scholarly literature focused on the Black middle class, but it is significantly less than studies on Blacks among the poor and working class. Additionally, most research on the Black middle class has been conducted in and focused on economically developed nations such as the United States. This literature began with DuBois’s discussion, in *The Philadelphia Negro* (1967 [1899]), of the, “talented tenth.” DuBois argued that Black professionals, such as doctors and lawyers, should be the group to advance Blacks. He also pushed for more Black, university-educated teachers so that Black students would have Black teachers. The views of DuBois were sharply contested by many, including Booker T. Washington, who advocated for vocational and industrial training for all to develop the Black community economically (Landry & Marsh, 2011). These differing positions began a series of fiery debates on the best methods to advance Black communities in the United States.

While DuBois and Washington’s debate spurred discussions on the Black middle class, the term wasn’t officially introduced into scholarly literature until 1925, by E. F. Frazier (1930, 1955, 1957). He documented the growth of the Black middle class through various methods, including demography and economics. Notably, he compared Black and White businesses, which led him to deeply criticize the American Black middle class, arguing that it may be even worse off than the Black working class because it felt and acted as if it were inferior to Whites. While Frazier was one of the greatest critics of the psychological status of the Black middle class, it is important to
note, however, that he did not fully ignore the systematic impact of segregation and racism on the formation of the Black middle class (Landry & Marsh, 2011).

Following this early scholarship, several themes of the Black middle class in the United States were explored by scholars, including understanding class and caste, the significance of race and the formation of the Black middle class, upward and downward mobility (focusing on 1962-73 and after 1973), analysis of the careers of Blacks and Whites belonging to the middle class, income levels in comparison with non-Black racial and ethnic groups, wealth accumulation in comparison with non-Blacks, segregation, and operation in public places (Thomas, 1993, 1995; Wilson, 1997; Grodsky & Pager, 2001; Attewell, Domina, Lavin, & Levey, 2004).

Additionally, of particular interest for this dissertation is a consideration of leadership and institutions within the Black middle class. Black professional, economic, religious, educational, and organizational affiliations played a central role not only in providing Black personnel to fulfill the social roles that segregation made more difficult to staff in not only providing Black personnel to fulfill the social roles that segregation made more difficult to staff, but also contributing to the economic and social growth of the Black middle class (Hine, 2003). As Hine documents, these institutions not only advanced the rights of Blacks but also addressed needs in health care, women’s rights, and the navigation of social struggles. Particular to the university setting, Black fraternities served as an institution enabling educational achievement and the growth of the Black middle class. Similarly, the creation of networks centered on school, church, professional, economic, social, and educational institutions served to not only fill a gap caused by White exclusion, but also to enrich the social life and middle class development of many Black citizens in the United States (Haynes, 2005). While social relationships played a role in the development of the Black middle class, however, it is important to note that compared to other races, educated,
middle class Blacks often face challenges that their peers do not, including the educational downward mobility of their children; lower marriage/cohabitation rates, which decrease household incomes; and unequal pay (Pattillo-McCoy, 1999; Grodsky & Pager, 2001; Loury, 2002; Battle, Bennett, & Lemelle, 2006).

While research on the black middle class in the United States may seem outside the scope of this project, this dissertation aspires to create a blueprint for NGOs, INGOs, and governments where there is currently a small but growing Black middle class. Therefore, it is important to learn from (and avoid) the pitfalls of the Black middle class in countries where one already exists.

**Black Middle Class**

If examining the Black middle class in developed nations in the United States is on the fringe of Black studies, it is almost non-existent in the context of developing nations. The few existing studies tend to focus on countries such as Brazil and India, which have rapidly growing economies (Kharas, 2010).

Even less attention is paid to the development of the Black middle class in African countries than in recently booming economies. South Africa, Kenya, Ghana, and Nigeria are some of the few countries mentioned in studies of the African, Black middle class. Of these countries, South Africa is most frequently studied, and research often focuses on race relations and the country’s history of Apartheid (Krige, 2012; Burger, Steenekamp, Van der Berg, & Zoch, 2014). The limited collection of literature available focusing on Africa suggests that scholars often wait until an economy is already at an aggressive growth rate to study the emergence of a Black middle class. There are limited studies on how countries in the earlier stages of economic growth, such as Rwanda, increase its Black middle class before a burst of economic activity. Additionally, of the literature that exists on the Black middle class in Africa, the central area of focus is defining the
characteristics of the group (Robeyns, 2005; Khunou, 2102; Berger et al., 2014). There is little information about how university education or innovative models in education in Africa contribute to the growth of an emerging middle class in a developing economy.

**Black Middle Class in Rwanda, and Clarifying the Definition of Black Middle Class for this Dissertation**

As outlined above, the middle class is little studied in low-income countries, and this also holds true for Rwanda. However, there are some studies that have touched on the topic, even if it is not fully fleshed out in terms of both the complex economic and social meanings of the term. Rwanda is often touted for its rapid fiscal growth following the 1994 genocide both domestically and abroad. For example, the *Economist* ranked Rwanda in the top ten of the world’s fastest growing economies in 2011. However, examining wealth distribution shows that this does not mean there’s an automatic development of the middle class, and a report *The Middle of the Pyramid: Dynamics of the Middle Class in Africa* by the African Development Bank (AfDB) in 2011 noted that amongst the 44 African countries studied, Rwanda had the third smallest middle class. By the AfDB’s definition, the “stable middle class” was defined as being able to spend between $4 and $20 per day. The “floating middle class” was characterized as the ability to spend between $2 and $4 per day. In Rwanda, only 2.6% of the population falls into the stable middle class category, and 5.1% meets the floating middle class economic threshold.

Essentially, although Rwanda’s economy is growing rapidly, there are high levels of inequality. In *Dynamic Industrial Policy in Africa* (2014), the African Union (AU) and the United Nations Economic Commission for Africa (UNECA) reported that in Africa, the richest 10% of the population usually controls between a quarter to half of a country’s total income, and the poorest often accounts for less than 10% of income. In Rwanda, the richest 10% control 40%
of the country’s total income, and the poor only control somewhere between 3-5%. Given
Rwanda’s rapid growth coupled with high levels of inequality, studying Kepler as an institution
aiming to bring poor youth into the middle class is of importance.

For the purposes of this dissertation, when defining a Black middle class in the context of
Rwanda, the financial definition of a middle class individual will be having the ability to spend
between $4 and $20, as described by the AfDB. While this number is not perhaps perfect or
exact, at this point in time, it is the one figure that has been studied and defined in the literature.

In addition to sheer spending levels, the job one actually performs may also be of
importance to defining the meaning of the middle class. In their analysis of a capitalist society,
John and Barbara Ehrenreich defined a professional-managerial class in *Radical America* (1979)
that was neither proletarian nor bourgeois, but controlled production through the development of
superior management skills. This group is often distinguished from other classes because of
education or training, which could include certifications for specific fields and university
degrees. With positions in academia, engineering, teaching, accounting, and management, the
professional-managerial class often has an income that’s above average in one’s country.

When defining the middle class for this dissertation, the Ehrenreichs’s definition of the
professional-managerial class comes closest to describing the types of positions that would
consist of the middle class in Rwanda. The one small tweak may be that the bar for holding
“specialized training” or skills in Rwanda would likely be lower than that found in the United
States. For example, in a country where technology is not interwoven into the fabric of the
university or professional setting, the ability to use Microsoft Excel and PowerPoint may be
likened to an advanced certificate in accounting in the United States. However, the idea of
having superior management skills that are related to a “thinking” rather than the manufacturing
economy, as well as making a higher than average salary for the country fits the definition of middle class in Rwanda for the purposes of studying Kepler in this dissertation.

There is also the social notion of the middle class that should be described when defining the middle class in Rwanda for the purposes of this dissertation. In Rwanda, some of the central activities related to “prestige” are the ability to pay or receive a dowry for marriage, the ability to have beers or sodas with colleagues on a weekend, and to be able to offer extra money to support one’s family in either property, food, or school fees for siblings. Additionally, appearance is quite important in Rwanda, and affording formal attire is considered a method of showing class. In the social realm, middle class would be defined as being able to engage in all of these activities if one chose that he or she wanted.

Overall, for the purposes of this dissertation, middle class is defined as having the ability to spend between $4-$20 per day, acquiring a position that would be classified as a part of the professional managerial class as defined above, and being able to socially engage in activities that are frequent cultural expressions of class as described above. While the author recognizes that this is not a perfect definition, this is meant to describe some general characteristics that enable readers to build a general framework around the meaning of middle class in the Rwandan context for the purposes of evaluating Kepler in its ability to produce graduates able to achieve benchmarks mapped to the middle class.

**Education in the Developing World**

Education in the developing world faces various challenges, including lack of infrastructure and facilities, limited funding, political instability, achievement gaps between boys and girls, limited teacher training, and struggles to access quality materials (Graham-Brown, 1991). Many developing countries are still addressing issues of basic access to primary education,
which means that institutions of higher education may receive less attention, funding, or consideration. With the challenges that education faces in the developing world, many of the brightest students attend university outside of their home country. This has hindered the economic growth of many developing countries, as the most talented university graduates often stay in the country in which they studied, meaning that they do not contribute to the economic advancement of their homeland. This phenomenon is known as “brain drain” (Pang, Lansang, & Haines, 2002).

**Blended Learning**

Kepler’s university program utilizes blended learning—or a method of teaching and learning that includes both components of in-person and on-line instruction—in its efforts to graduate students that will increase Rwanda’s Black middle class. This new field of instructional study includes three central theories that explain how blended learning works in a school setting. They are exploring, explaining, and designing (Picciano, 2014).

Since the 1960s, blended learning has had a debate-filled history. Advocates have noted the advantages of combining technology and in person instruction, and detractors have argued that a greater reliance on technology does not automatically improve learning (Moskal, Dziuban, & Hartman, 2013). There are several categories of blended learning (Picciano, 2014) and a variety of ways that universities implement blended learning models (Mayadas & Picciano, 2007; Graham, Woodfield, & Harrison, 2013). In institutions of higher learning, blended learning can work to address a myriad of student, faculty, institutional, city, and country needs: including inadequate classroom space, limited access to content expertise, the need for collaboration, and space for innovation (Garrison & Kanuka, 2004; Dziuban, Hartman, & Moskal, 2004; Bonk & Graham, 2006; Allen & Seaman, 2011). Blended learning is most successful when aligned with an institution of higher learning’s goals. When the needs of students, faculty, and the institution are
considered and the program is designed to meet those goals, it can transform the educational landscape (Brier, 2012; Moskal et al., 2013).

A U.S. Department of Education comparison of student learning in online courses, in-person courses, and blended courses, while not fully conclusive, found evidence that students did well in blended learning courses (Means et al., 2010). Additionally, the different modalities of teaching and learning that technology enables means teachers can better address different types of learners, and quick data analytics can identify students in need of early interventions and assistance in specific areas as well as those that are ready for advanced instruction (Zhao, Lei, Yan, Lai, & Tan, 2005; Juwah, 2006). It should be noted, however, that simply introducing technology alone without changes in pedagogy will not improve learning outcomes (Angrist & Lavy, 2002; Banerjee, Cole, Duflo, & Linden, 2007; Barrera-Osorio & Linden, 2009). Systematic training, thoughtful preparation, and continuous examination produce effective blended program with high academic outcomes.

Methodology
This dissertation aims to explore the ways in which innovations in university education can lead to the formation of a Black middle class in a developing country. A case study is most appropriate for this research because its purpose is to understand a specific case (or sometimes cases) in its real-world context. Case studies aim for an in-depth understanding of a person, organization, event, program, or social group in order to produce new knowledge about behavior in the real world and analyze its meaning (Bromley, 1986). This definition has also been added to by more recent theory on case studies, namely that a case study is not only about the product of inquiry, but also about the process of inquiry (Denzin & Lincoln, 2002). The topic of this dissertation— understanding how university education affects the creation of the Black middle
class in a developing nation—is particularly well suited for a case study because case studies allow for the study of a process (Merriam, 1998). Since, “case studies help us to understand processes of events, projects, and programmes and to discover context characteristics that will shed light on an issue or object” (Sanders, 1981) a case study of Kepler will provide multiple forms of data to be explored. Those forms of data converge in the creation and building process of a new innovative university aimed at moving poor students into the middle class.

Case studies can be divided into three broad categories: 1) descriptive, 2) interpretive, and 3) evaluative. Since this dissertation aims to understand and judge how university education both alleviates and perpetuates inequality in the process of trying to create a Black middle class, an evaluative case study is most appropriate. It involves collecting multiple sources of data for the purpose of description, explanation, and then judgment (Merriam, 1998).

Data
Both quantitative and qualitative data will be used to describe Kepler. Below, I outline each of the types of data that will be used to describe and explain Kepler. This also includes a description of the independent and dependent variables.

Quantitative Analysis
I utilize data from an analysis of the Kepler University program in Kigali, Rwanda conducted by IDinsight, a company providing data and research on social impact projects around Africa and the developing world. The study compares learning outcomes of students at other Rwandan universities in Kigali and Kepler. These data will supplement qualitative observations made in the case study to describe and explain Kepler. Additionally, since the qualitative data compare Kepler students to those attending other universities, it adds nuance to the study. While the qualitative data focuses on Kepler, a quantitative analysis compares other university students.
It therefore adds an ability metric to judge Kepler’s role in the creation of a Black middle class.

The data include a comparison of Kepler’s first year of students (N=50) with a control group of students attending traditional universities (N=200). The comparison group was selected by screening over 500 students attending traditional universities in Kigali. From this group, 200 students that best matched the demographics of Kepler students were selected. The selection of the final control group was based on a background characteristics survey of 200 students. The covariates used to match students include gender, age, ubudehe (a community-based government measure of poverty), belief in ability to progress out of poverty, high school grades, and national exam scores.

**Dependent Variables**

This study measures the performance of Kepler students and the control group on the Collegiate Learning Assessment (CLA +), Scholastic Level Exam (SLE), and a computer literacy test. The CLA+ is a critical thinking test, which measures ability to evaluate and make arguments, quantitative and scientific analysis, problem solving, and writing. The test is three hours long, consisting of a performance task and selected response questions. The performance task requires students to construct an essay response analyzing primary source documents to solve a problem. This portion of the test is two hours in length. The remaining hour of the test is multiple-choice questions that demand analysis of supporting documents.

The SLE is a multiple-choice exam measuring basic reasoning, mathematics, and English language performance. It is similar to the ACT and SAT exams but shorter. The computer literacy test consists of typing, effective Internet research, and performing tasks in a variety of Microsoft Word programs.
The quantitative portion of this dissertation will focus on the performance of Kepler students against a group of matched students attending traditional universities in Kigali on all three tests. IDinsight also conducted a midline analysis, but only baseline and endline scores will be compared.

The dependent variable for this study is the difference in performance from term 1 to term 3. There are four variables within this analysis: performance on the CLA+ exam, on the SLE, the computer knowledge test, and a composite of all three.

Independent Variables
Bivariate analyses incorporate appropriate bivariate tests to compare the performance of different groups related to middle-class formation. Since the social and economic development of a nation is directly related to the advancement of women (World Bank, 2013), the performance of men and women was be measured. Gender performance is of particular interest for Rwanda and other sub-Saharan nations. They have some of the world’s highest poverty and lowest literacy rates, with girls’ academic performance significantly lagging behind that of boys. The struggles of women’s education in sub-Saharan Africa are well documented in three central areas: 1) enrollment, 2) grade repetition and dropping out (wastage), and 3) levels of educational attainment (King & Hill, 1997). It should be noted that even though Rwanda and other sub-Saharan Africa countries have struggled greatly with the development of and access to quality education programs, they have made a tremendous amount of progress compared to other developing regions. None of the sub-Saharan countries, however, have been able to equalize male and female educational advancements. For example, in secondary school curriculums disparities still exist, with women offered fewer opportunities in math and science (Anikpo, 2000).

A comparison in achievement scores was also run between the performance of urban and
rural students. The comparison is of particular interest because in sub-Saharan Africa, there is often higher academic achievement in urban schools, as well as more resources and higher-quality teachers (Lee, Zuze, & Ross, 2005). Additionally, primary school students in rural areas consistently underperform their counterparts in urban areas, leading to lower attendance and achievement in higher education (Zhang, 2006).

Student exam performance according to *ubudehe* categories, or the Rwandan government’s measurement of poverty status, will also be compared. Around the world, it is well documented that poverty interferes with educational achievement, and this is true for sub-Saharan Africa and Rwanda as well. Specifically, there is a correlation in the region between household income levels and uneven enrollment in secondary schools. In higher education, wealth is the most powerful determinant of participation and progression until graduation through a program of study (Lewin, 2009).

Age is another independent variable that will be measured. Because of regional geopolitical or personal instability children in sub-Saharan Africa tend to be 2-5 years older than their student counterparts in the United States or Asia. Their delay can lead to lower academic achievement levels (Lewin, 2009). This holds true for university-aged students in Kigali today, as education was interrupted by school closings during and after the genocide. Understanding differences in age-related performance may help in determining the likely makeup of the Black middle class according to age.

**Qualitative Analysis**

In this case study, several types of qualitative data sources describe and explain Kepler, including direct observations, interviews, documents, and participant-observation.
Interviews

Interviews from two sources were utilized in this study. First, were the interviews of Kepler students conducted in 2013 by IDinsight. They focused on four areas: 1) Kepler’s academic support structures, 2) levels of student stress and ability to handle challenges, 3) program impact on both personal and academic development, 4) and student housing. Eight students were interviewed, four females and four males. The major interview themes were noted and analyzed. Second, 48 founding cohort students were interviewed about their experiences in the Kepler program. The interviews focused on the social and educational background of the students, how and what students had heard about Kepler, their experiences in urban and rural environments, exposure to technology before and during their university experiences, and beliefs about their ability to be successful in the future. These interviews provided additional insights about and elucidation of issues found in the quantitative analysis and in direct observations. They were also used to validate results from the quantitative analysis.

Participant Observation

Because I served as the Chief Academic Officer at Kepler, I was an active participant in the organization. Participant observations are integrated into this study, both describing my participation and observations in leading staff meetings, academic probation meetings, teaching a class, meeting with managers, meeting with the Rwandan government and other stakeholders, and observations on student success or participation. These data were recorded and coded and compared alongside other data.

Analysis

I collected data and compiled and compared all of it to both describe and analyze Kepler. An evaluative judgement of Kepler’s role in both perpetuating and alleviating social inequalities in the creation of the Black middle class was conducted.
Overview of Kepler

There are two campuses in the Kepler program. The following will describe the academic programs and non-academic supports at each campus.

Kepler Kigali Academic Overview

Academically, the initial vision for Kepler was to bring a world-class curriculum and U.S. degrees to students in Rwanda through a blended learning curriculum, including a heavy reliance on massive open online courses (MOOCs) from leading universities around the world. A “flipped classroom” approach where content was delivered to students independently had a leading role in the curriculum. Students were to complement the approach by coming to class at Kepler’s physical campus. There they would discuss the meaning of the materials and content and work on activities related to course material. Course facilitators at Kepler were to give in-person guidance on project and competency based modules that focused on skills relevant for employment and success in Southern New Hampshire University’s College for America (CfA). College for America is a new, innovative program that grants degrees based on projects that are mapped to competencies rather than seat and credit time. The program is fully accredited and drastically reduces the cost of college, at $3,000 per year. A large part of this cost reduction is related to removing faculty from the program (there’s no faculty) but instead using highly trained assessors. Essentially, CfA values competencies and what a student can do rather than time spent in a seat or class. Once students successfully completed both the Kepler work and competencies through projects evaluated by CfA, students would earn an Associate’s degree in general studies and ultimately a Bachelor’s degree in health care management, business management, or communications.

When Kepler began, the curriculum was constructed according to the original vision. Students were enrolled in professional competencies, technology, and writing classes, along with four MOOC-based classes. They were required to watch the MOOC lectures outside of class-time
and come to class ready with questions about the material, to engage in projects enabling a deep
dissection of the material, and to address topics, with the assistance of an instructor, through a Rwandan cultural context. Ultimately, courses were to culminate in a CfA competency-based project, which would be used as the final examination for the course.

Following the initial attempt with this model, there were several components of the model that worked well and several challenges that quickly became apparent. The most urgent of the challenges was related to student levels of English and writing—students had never written essays nor even paragraphs—which were much lower than originally anticipated and therefore a significant obstacle to learning. Outside of English and writing levels, it was clear that there were other areas they were significantly underprepared for and needed support on, including cultural understandings about academic honesty, general workload, and the program’s learning style.

Kepler also faced significant challenges related to CfA during its inaugural year. Namely, because CfA launched a few months after the Kepler program began, the Kepler academic team knew what the competencies required for the degree were, but the team did not know the specific content of the projects. This made utilizing the projects for the final exam difficult because there was no way to seamlessly integrate the skills required by CfA without knowing project specifics. Additionally, the evaluation systems were disjointed between Kepler and CfA’s competency-based program. Based solely on mastering competencies, CfA does not use traditional grades or GPAs. Kepler administrators, however, decided that in the whirl of all that was being addressed in the start-up there was insufficient time to train teachers to use competency-based grading. Therefore, students were straddling competency-based learning—to earn competencies for their degrees in the United States—at the same time as they were receiving grades and traditional GPAs from Kepler courses. Last, CfA was not ready to accredit the Bachelor’s in Business Management
degree as originally planned and promised. As a result, trust between Kepler staff and students, who had been told since the admissions process that a Bachelor’s in Business Management would be an option, suffered.

In its inaugural year, gender proved a challenge for Kepler. While it maintained a commitment to gender equality, as established in the admissions process, it was clear from an early stage that female students were less prepared for the rigors of the program than their male colleagues. Many women were underperforming and experiencing high levels of psychological stress.

Consequently, Kepler made several changes to its curriculum for subsequent students, including: 1) modifying MOOCs, 2) developing Kepler traits and non-negotiables, 3) developing and implementing a bridge program, 4) revamping the writing curriculum, 5) changing final exams, 6) developing and implementing gender interventions, 7) creating year-long foundational courses, and 8) developing modular courses. These changes, which remain crucial to the Kepler academic model today, are outlined below.

While the board of the Kepler program (and much of the world) was hopeful and buzzing about the possible transformative impact of MOOCs for students lacking access to high-quality education, it became immediately clear to the Kepler academic program that MOOCs were not going to be a magical answer in transforming the educational experience of bright and highly motivated but ill-prepared students. MOOCs were not generally using engaging or innovative pedagogical methods, and the English levels of the students were such that the comprehension of MOOC content was low. Kepler immediately modified its MOOC use after the first term. Now, rather than using MOOCs as the central and core content base of a class or the curriculum, the
curriculum director and/or course facilitators will choose short segments that are most engaging or explain content particularly well. Content may be viewed in or outside of the class.

Early on, Kepler noticed a problem with high levels of academic dishonesty. While the Kepler Traits and Non-Negotiables were developed before the opening of the first Kepler class, the academic staff realized it would need to interweave the traits and non-negotiables aggressively in the curriculum. Kepler Traits are a set of guiding competencies (or “soft skills”) that students are evaluated on in the classroom as well as in their internships or places of employment. Example traits include “Conscientious and Ethical Citizen” and “Creative and Critical Thinker.” These traits are intended to help students both understand how to navigate places of work as well as address poor habits like academic dishonesty, tardiness, and absenteeism.

Kepler students were overwhelmed and overloaded with work at the beginning of their program experience. To address this, Kepler began a bridge program that expanded from the original one-week orientation to a six-week program. Originally, orientation included giving housing assignments, distributing laptops, giving out schedules, and reviewing the broad requirements for the Kepler program. The bridge program for the next cohort of students, however, included intensive modules in academic honesty, English, technology, team building, getting to know Kigali, and in-depth teaching about the expectations and consequences for not meeting Kepler’s program requirements. While there are still significant problems with academic honesty, Kepler plans to maintain the bridge program for all subsequent students entering the university program.

The fourth major change Kepler made based on lessons from the first year was supporting student skills development for those with a low level of English and writing proficiency. In fact, the entire writing curriculum was overhauled. Originally, it focused heavily on academic writing.
Instead, Kepler now uses a 21st Century Communications course that it developed. The course covers reading, writing, speaking, and listening in English. The course also incorporates relevant modern day communication skills such as reading and discussing the news, blogging, and public speaking in large and small groups.

Kepler also changed its use of competency-based projects from CfA because they are no longer used as final exams. Instead, Kepler uses final projects and presentations that it develops in-house in order to assess if a student has mastered class content. The CfA projects are used solely for earning the Associate’s and Bachelor’s degrees.

As described earlier, Kepler found females were less prepared than their male counterparts for the rigors of the Kepler program. To maintain its initial vision of developing partnerships and interventions to increase the participation and performance of young women, Kepler offered staff training and activities to better understand gender-based differences in the Rwanda context. They included single-gender book clubs and a single-gender challenge-based learning course. Kepler worked with a consultant to get an analysis on what was successful and what needed improvement from a gendered lens. This consultant then developed a gender leadership team comprised of Kepler management, staff, and students.

Kepler developed and still uses foundational year courses that last an entire first year of a Kepler student’s academic experience. These are designed to address the problem of students being overwhelmed when they first attended Kepler, as well as determining when students are ready to begin their CfA projects, engage in work-study or internship positions, and take other elective courses. The four foundational year courses are Technology Skills, Methods of Thinking for Business, Professional Competencies, and Communications. During these foundational courses, students take benchmark assessments every six weeks to track their progress.
Lastly, Kepler has worked to create modular courses that run for six weeks and address the expressed needs of employers and strengths and weaknesses that CfA data points reveal. In this model, after the foundational year, Kepler students select from a variety of modular courses (electives) to build and improve their skill sets while maintaining flexibility to participate in jobs or internships and still complete projects to earn competencies that lead to degrees.

Kepler’s blended learning model has changed significantly since the program began, as outlined in the section above. At the core of the model are three central components: 1) online learning, 2) in-person facilitation, and 3) employment connections and workplace training. The Kepler and SNHU partnership designed to provide degrees to students in Rwanda lies at the intersection of these three components. In the literature on blended learning, there are several models outlined in the realm of blended learning, ranging from almost all in-person facilitation with email as a support to completely on-line models with no in-person facilitation (Picciano, 2007).

At Kepler, in terms of time spent on-line versus time spent with in-person facilitation, there is no proscribed percentage of time spent in-person with a facilitator versus on-line. In fact, the amount of time spent on-line varies as the program progresses, as well as with the academic, life, and work circumstances of a student. Generally, at the beginning of the Kepler program, most of the instruction is in-person. This is particularly the case with the summer bridge program, which is six weeks long and focuses on getting students the technological, social, and basic academic skills needed to succeed in the program. During this time, the only technology students use is email and a LMS (learning management system). Therefore, at the beginning of the Kepler experience, the blended learning program could be considered as almost fully in-person with a few on-line supports.
However, after the first six-week bridge program, the blended learning components begin to take on different percentages of on-line learning versus in-person learning for each student. After bridging, students begin to engage in a series of six-week modules to determine their readiness to engage in the on-line learning required to earn their degrees through Southern New Hampshire University’s CfA program. From this moment, students are expected to begin navigating on-line resources to learn more independently, watch lectures at home, come to classes with questions and their own thinking, and use both on-line resources and in-person facilitators to help shape their thinking. Based on their performance on these projects, students are determined for readiness to enter the on-line learning platform to begin their degrees. However, once a student gets to the degree-earning stage, they are still interacting with course facilitators through at least one course, and with a coach.

The type of feedback a student receives from SNHU in their on-line projects also determines the amount of in-person or on-line support a student receives. Because the program is competency-based, there are no grades. This also means that a student may meet the standard on the first time he or she engages in the project. On the other end of the spectrum, some students have had up to fifteen rounds of feedback before meeting the standard for a project. Kepler creates coaching hours and study halls to assist students in digesting and applying their project feedback. Therefore, the amount of time a student spends learning on-line versus in-person often depends on how well a student performs on his or her CfA projects. In this manner, the amount of time engaged in in-person versus blended learning varies greatly with the level of support required by the student. Kepler designs its supports so that students get the amount of in-person learning needed to ensure academic success.
Outside of project performance, the amount of student time spent on-line versus in-person is also determined by the internship and work opportunities a student may engage in throughout the program. For example, a high-performing student that earns an internship opportunity that subsequently turns into full-time employment would meet with Kepler staff to build his or her schedule of on-line and in-person learning. The performance of the student is then tracked throughout the time of the student’s employment and is cross-referenced with student progress and performance. Depending on student performance, he or she would have the amount of in-person or on-line time adjusted as needed. In many cases, students can determine schedule changes needed. In other cases, student performance—either with their employer or academically—may trigger more mandated in-person time on-campus.

On the whole, blended learning at Kepler could be characterized as beginning with large amounts of time spent on campus with in-person facilitation. After the initial stages of the program, the amount of time spent with in-person facilitators and on-line is largely determined by the level of student performance and progress, both in the workplace and on-line. It is, therefore, a blended learning model that varies from student to student, given that it is designed around the performance and needs of the students rather than in a rigid programmatic design.

Kepler Kigali Partnerships Overview

Several key relationships are at the core of Kepler’s ability to bring a degree from the United States to university students in Rwanda. On the government regulatory side, Kepler maintains a memorandum of understanding with the Higher Education Council of the Ministry of Education—specifically Kepler, is not officially registered as a university in Rwanda but rather as an international non-governmental organization (NGO) with the government of Rwanda. This status allows Kepler the unique flexibility of working with the Ministry of Education but not being overseen or regulated by it. Its degree granting partner is accredited in the United States. Although
Kepler is not formally regulated by the government, the Ministry of Education visits frequently, and Kepler shares its research findings with the National Institute of Statistics and the Ministry of Education on a yearly basis, or when requested by the government.

Outside of governmental relations, Kepler has also established a range of technology, academic, and research partnerships since its inception, many of which have developed organically over time. As mentioned in the earlier brief description of Kepler, the central partnership that allows Kepler to grant a U.S. accredited Bachelor’s degree is with Southern New Hampshire University’s College for America. Kepler’s founders cultivated this relationship through a memorandum of understanding (MOU) signed in autumn of 2013. Currently, Kepler is CfA’s only international partner, and although Kepler originally indicated interest in pursuing other degree-granting partnerships, Southern New Hampshire University is the only institution in the U.S. from which Kepler students can earn their degrees.

Kepler has cultivated relationships by reaching out to other universities and organizations. Similarly, institutions interested in partnering with an innovative organization or conducting research have reached out to Kepler. For example, Tulane University has worked with Kepler since 2013, when Kepler staff reached out to get assistance on English as a New Language (NSL) resources. This then developed into a successful virtual mentorship program where Kepler students were virtually mentored by Tulane students earning degrees in English as a Second Language. Kepler students benefit by getting help with writing and speaking English, and Tulane students earn credit in service learning required for graduation.

Pioneer Academics, an online mentorship and global research program has approached Kepler about a partnership to provide Kepler students research opportunities as a part of their corporate social responsibility efforts. From this partnership, qualified Kepler students were
selected to receive scholarships to engage in the company’s virtual research mentorship program with distinguished professors from across the world.

Early partnerships with technological consultants that offered advice in exchange for being able to include work with Kepler on their résumés and have led to Kepler’s adoption of Canvas, a customized learning management system and other technological platforms.

Kepler has worked with varying degrees of success with volunteers and researchers since it inception. For example, in 2015, Kepler worked with Massachusetts Institute of Technology to launch a low-cost scientific laboratory at the Kigali campus. The effort is a pilot led by two recent MIT graduates, and has required considerable time and financial management by Kepler staff. It remains to be seen if this partnership will be of mutual benefit to Kepler and MIT. In all, working with several partners and organizations has been key to developing a model that will enable Kepler to reach its goal of providing a world-class education at a low cost.

Kepler Kigali Internships & Jobs Overview

Ensuring students have the skills and experience needed to seize employment opportunities has always been a core component of Kepler’s vision. Kepler has focused on helping students learn on the job through structured internships. The internship program began on a small scale at the end of the institution’s first year through relationships that staff developed with employers. Kepler works to actively forge relationships with employers, which have opened the doors to Kepler students earning work-study, internship, and employment positions. Kepler provides opportunities, but students still have to apply for and interview for internship and job placements. While this has bolstered student skill levels, challenges have also been created through Kepler’s high rate of internship and employment placement. Currently, students that are in full-time employment positions still work to complete their degree through CfA, but they are not required to take Kepler classes. As a result, some of them have begun to focus on finances over learning
and have exhibited some problematic attitudes in their workplaces. Especially in Kepler’s first cohort of students, where several internships have led to full-time jobs and 80% of students have jobs before even earning their Bachelor’s degree, rates of competency completion have slowed. Students have expressed high levels of stress in navigating their jobs and studies, and have in some cases become arrogant or irresponsible in the workplace. It should be noted, however, that most employers still report that Kepler students vastly outperform the competition in the Rwandan labor market.

**Kepler Kigali Student Services Overview**

Outside of its regular academic services, Kepler has provided additional student support services throughout the program. Initially, Kepler provided a modest living stipend about $5 less than the average national salary for workers in Rwanda. Kepler continues to provide this stipend but has considered changing the policy and having students take out a loan for the living stipend. Initially, Kepler also offers health services and student housing to students. After the first year, in response to significant weight loss among students and concerns about physical and mental health, Kepler introduced on-campus lunch and a clinical psychologist for counseling services. They remain intact.

The mandatory housing policy, which states that all students in all levels of study must live in student housing, has been particularly beneficial to female students. While living in student housing, they are freed from the household expectations and responsibilities typically tasked to young women in Rwanda—including fetching water, caring for sick family members, cooking, and cleaning the house. It also indirectly acts to discourage marriage until after a student has finished his or her degree.
Kepler Kigali Admissions and Financial Aid Overview

From the outset, Kepler focused on enrolling young people with talent and without the financial means to access a high quality university education and job to move them out of poverty. Recognizing the gender gap in achievement between men and women in Rwanda and across sub-Saharan Africa, Kepler also set out to enroll 50% women. Kepler’s financial aid and admissions policies have met these goals.

The process of admissions has evolved from a more rote mathematics, English, and interview exam to a more robust procedure. The new process leverages on-line and text messaging technology in the process. It also extends Kepler’s reach by offering test administration and information sessions at a minimum of six difference sites across the country. In 2014, Kepler expanded its admissions outreach to Uganda and Burundi, but retracted its outreach to Uganda in 2015 due to lower demand in the country. Kepler, however, then added recruitment in Goma in the Democratic Republic of the Congo (DRC) and plans to add the city of Bukavu in its next admissions cycle.

Throughout the admissions process, internal leaders have been developed to lead the process, and the test has evolved year to year to ensure the identification of students that will succeed, which especially requires high levels of English language proficiency. Therefore, the admissions test now includes a listening comprehension section, English and Mathematics, reading and critical thinking, and an essay component. About half of those tested receive an interview. Kepler’s application process begins in December and closes in February, and tests are administered throughout the country, in Burundi, and the DRC in March. Admissions decisions are communicated to students in April.

In its admissions and financial aid process, Kepler continues to navigate a fundamental tension between being simultaneously financially sustainable and offering a high quality education
that is affordable for a low-income population. Kepler’s first cohort was fully funded through philanthropy. With the second cohort of students entering in 2014, a signature was required to indicate student willingness to consider loans—with the choice to opt in or out of the program once developed. This means that students will sign on to pay back the same rate as local tuition (roughly $1,500 per year) once they’re working. The institutions use several terminologies to talk about financial support for students, including tuition deferment, low-interest loans, and scholarships. However, none of these models or terminologies have been fully adopted.

Kepler Kigali Staffing and Professional Development Overview

Originally, Kepler’s visions of its teaching staff encompassed a model where expatriate instructors, Teaching Fellows, would enhance and guide students through MOOCs with the assistance of Rwanda Teaching Fellows-in-training. In 2013, Kepler’s launch largely fulfilled this plan. From the outside, however, it became apparent that a majority expatriate teaching model posed problems for cultural relevance, sustainability, and ownership. Consequently, two months after the launch, 4-6 Rwanda teachers were hired to join Kepler’s team and a co-teaching model began. In the co-teaching model, local and expatriate teachers collaborated as equal partners to deliver, modify, and give feedback on lesson plans. As the program has grown, Kepler has continued to phase out expatriate teachers and invest more in local teachers, with a few being hired from Uganda and the DRC. Kepler has extended this model to include high-performing Kepler students in their second and third years to function as teacher assistants with the hope of training some post-graduate, full-time instructional staff.

Hiring for instructors at Kepler generally takes place in May for the following academic year. The interview is performance-based, involving a group problem-solving discussion session, a writing task, and coaching and feedback sessions with a Kepler student, which includes the student giving the candidate feedback as well. Candidates are chosen based on their ability to read,
write, and speak English, their ability to communicate and connect with students, and their ability to give and receive feedback. To select candidates, a committee of teachers and students rate all candidates on a rubric and have a discussion to provide feedback to other committee members and to management, which makes the ultimate hiring decision.

Once a course facilitator is hired at Kepler, he or she enters a rigorous and intense yet supportive period of professional development. The ultimate goal at Kepler is to create paths of leadership from within the institution. Therefore, professional development is systematically built into all teacher’s schedules in the form of meetings. Much of the curriculum used for professional development sessions are taken from those used in high-performing New York City classrooms, such as Teach Like a Champion, to improve teaching techniques, and Rethinking Teacher Evaluation and Supervision by Kim Marshall, to give frequent, structured feedback to instructors. Each school year begins with two weeks of full-time professional development, as well as a full staff retreat. Staff evaluation for teachers follows a model where routine observations and frequent, real-time feedback is offered rather than once a year performance evaluations.

Underlying Kepler’s formalized feedback system is its leadership’s attempts to create leaders through empowering the staff to take risks, make mistakes, and own innovative learning tasks. While this can be challenging in the more rigid Rwandan cultural context, Kepler has created systems to enable Rwandan leadership to rise through risk taking and managerial tasks. For example, the Summer Bridge program (which prepares students for the rigorous Kepler program) is run by Rwandans, and two campus leaders are being groomed to take over as early as the 2016-2017 academic year.

Kepler Kigali Self-Evaluation and Learning Overview

Kepler’s commitment to self-evaluation and learning from the program was outlined in early proposals for funding and has been achieved in various ways since the project began in 2013.
Kepler has made improvements in both the non-academic and academic processes over its first two years. Kepler strives to identify what works well quickly, what doesn’t work well, and to make changes accordingly. Most changes have been informed by both internal and external evaluations. Kepler hired IDinsight to evaluate its program against a matched control group of non-Kepler students in 2013 so that it had data from the inception of its program. In addition, although IDinsight is mostly a quantitative research firm, Kepler requested qualitative data to add nuance to quantitative findings.

This research informed many of the changes outlined in the earlier academics section, with the gender interventions serving as a prime example of how the institution uses research to inform its academic decision-making. For example, the gender evaluation of Kepler’s first cohort of students showed that female and male students were making progress at the same rate. On one hand, this reflected that there were components of the curriculum that were working for men and women equally. Conversely, it was problematic because females began the program at an academic deficit, which meant that they were still performing below the men given their lagging academic starting points. In response to the findings, Kepler not only designed gender-based instructional interventions, but they also tested them in randomized control trials (RCTs) to determine which interventions were most effective.

Additionally, Kepler conducted RCTs to evaluate the performance of expatriate versus local teachers. It formed a gender committee composed of individuals from all levels of the institution to analyze the ways in which both their own individual and collective actions and beliefs affected the work.

In summary, Kepler aims to stress research, innovation, and flexibility in the creation of its Kigali program. While funding for research into the effectiveness of every component of the
program is limited, Kepler intends to use its budget and resources to both share its learning and use its findings to improve the program to ensure student success.

**Kepler Kiziba General Overview**

Kepler has a campus situated in the Kiziba Refugee Camp—home to over 17,000 Congolese refugees since 1996—in western Rwanda. It is Rwanda’s first university education program offered in a camp. The first cohort began in August 2015. The Kepler Kiziba concept was born out of conversations with Kepler management, the IKEA foundation, and UNHCR in early 2015. The Kiziba camp’s education program included only one school at the time, which went through Senior 3 (equivalent to 9th grade in the US). To graduate from secondary school, students had to find a scholarship or other means to attend school outside of the camp. Opportunities for higher education or long-term employment were almost nonexistent for refugees, outside of a few positions within non-governmental organizations, which were particularly difficult for Kiziba’s female residents to access. Previously, Kepler received a large number of applications from refugee students in Rwanda, but only three met Kepler’s competitive admissions standards. In response to the proven demand and clear dire need for tertiary education, Kepler developed and proposed a Kiziba pilot program. While the Kiziba and Kigali campuses share the same fundamental vision of offering students a Bachelor’s degree from the United States and creating a pathway of employment for students, the process of realizing this vision is different in several distinct ways. Kiziba has a challenging operational environment—there is no electricity in the camp, for example—with a unique population. The next section highlights these distinctions.

**An Overview of Kepler Kiziba Academics**

While the ultimate academic outcomes and curricular goals are the same across both the Kiziba and Kigali campuses, there are several core differences in delivery. Because Kepler has still not constructed its own space and is borrowing a classroom from the camp and because several
of the students are teachers at the primary school during the day, the schedule is different than the Kigali campus, with classes running from 2 to 6pm. Because all parties did not sign the MOU to begin Kepler until August 2015, students were unable to complete a bridge program, although Kepler plans to have subsequent cohorts follow the program. Also, given the particular challenges of a refugee camp, the pilot at Kiziba, with 25 students, is smaller than the Kepler Kigali classes. There is a different student to teacher ratio than most of the Kigali campus classes. A major curricular deviation from the Kigali program is a community leadership graduation requirement for Kiziba students. Additionally, Kiziba students are not allowed to take their laptops home because of security concerns in the camp. The Kiziba campus is a pilot program. Kepler expects to make changes similar to those made on the Kigali campus in its first year and fashion a curriculum appropriate for the refugee camp.

**Kepler Kiziba Partnerships Overview**

In addition to the partnerships with Southern New Hampshire University’s College for America program and the Rwandan Ministry of Education, the Kiziba campus requires close collaboration and approval from the government’s Minister of Disaster Management and Refugee Affairs. The Kiziba campus includes close collaboration with UNHCR and local camp management to ensure alignment of camp security procedures, activities, and approaches. UNHCR, Plan International, and other NGOs are also potential partners for internship placements for students within the camp.

**Kepler Kiziba Student Services Overview**

UNCHR and its collaborating partners such as World Food Programme and Africa Humanitarian Action provide food, housing, and other basic services to Kiziba camp residents. Kepler does not offer the meal or housing services found at the Kigali campus. The program does, however, provide a snack and is working with a nutritionist to consider providing lunch at the
campus. Kepler nursing and counseling staff work through both camp partners and periodically visit the camp to provide counseling and health services. Additional counseling services are provided through Skype, and in some medical or mental health situations students are also brought to Kigali. Kepler Kiziba is particularly aware that students need adequate health, emotional, nutritional, and psychological support. The school’s target population and refugee identity often result in a psychology of victimhood, which has the potential to undermine student progress.

**An Overview of Kepler Kiziba Staffing and Professional Development**

Kepler Kigali’s philosophy of empowerment through ownership and its culture of professional development are applied to the Kiziba campus as well. As Kepler determines how to best staff and train teachers across multiple campuses, there are bound to be changes as well as more development of the systems and structures at Kepler Kiziba. As of now, teachers cycle in and out of the Kigali campus in six-week instructional cycles.

**An Overview of Kepler Kiziba Jobs and Internships**

As with the Kigali campus, a work-based component is central to the Kepler Kiziba vision. While students are still in their foundational year, the Kigali campus internship and employment program serves as a model for student progress. Kepler has already held happy hours in Kibuye, the town closest to the Kiziba program, to introduce the Kiziba program and its students to prospective employers. Unlike restrictions often placed on refugees in other countries those residing in Rwanda have the right to work and freedom of movement.

**An Overview of Kepler Kiziba Admissions and Financial Aid**

Student composition and cohort size are core differences between the Kiziba and Kigali campuses. Consistent with the plan outlined in the original Kiziba proposal, the cohort size of the 2015 students was much smaller, serving only 25. Kepler sought a gender balance similar to the Kigali cohort’s, but female applicants had difficulty speaking and writing English. As a result,
Kepler admitted twenty males and only five females. To address this disparity, Kepler launched a work-study position, the Women’s Preparatory Program (WPP), a 6-month program led by female Kigali students in the second-year cohort to improve female applicant preparation. While the admissions test results for the 2016 cohort were unavailable at the time of writing, Kepler’s hope is that the WPP will generate a larger pool of female applicants qualified for the program.

Kepler is also considering expanding its refugee program to other camps in Rwanda. To test working in another camp, to increase the number of qualified refugee applicants in Rwanda, and to determine the effectiveness of a mixed-gender preparation program versus a women’s only preparation program, Kepler ran a mixed-gender preparatory program in Gihembe refugee camp in Rwanda. It is also assessing the viability of opening a campus in Mahama refugee camp, home to an influx of 45,000 Burundian refugees who political conflict there in April 2014. Similar to the Kigali campus, the first cohort of refugee students is not expected to pay for their degrees. If successful, Kepler plans to work with funders to ensure refugee students are not required to pay tuition.
Chapter 2: THEORETICAL FRAMEWORK & LITERATURE REVIEW

This chapter will review this dissertation’s theoretical framework and literature related to innovations in university education, the creation of a Black middle class, an overview of the Black middle class in the United States and in the developing world, education in the developing world, and blended learning.

Theoretical Framework

Scholars have long connected schools to the formation of class, in particular, Marxist theories of schooling and economic classes (Marx & Engels, 1970; Bowles & Gintis, 1976; Giroux, 1983). Marx explained that the formation of social classes was the result of struggles between the bourgeoisie (those who own the means of production) and the proletariat (those who sell their labor). This inexorably causes conflict between the classes. Institutions of education often serve to replicate social classes and roles in society (Apple & Jungck, 1990).

Following Marx, many neo theorists have challenged the idea that education is an avenue out of poverty (Bowles & Gintis, 1976) and have maintained that acts of schooling are never neutral. Instead, schools are places of indoctrination and are inexorably tied to the creation of classes and positions within society (Apple & Jungeck, 1990). Bowles and Gintis’s “correspondence theory” argues that schools serve as places of social reproduction that universities do and do not meet the needs of students when trying to create a middle class. In particular, I will describe school hierarchy and how it serves to prepare “workers.” Additionally, ideological hegemony (Gramsci, 1971), or schools functioning as places of normalizing the ruling class and its cultural habits, will also provide a theoretical framework for this dissertation.

Jean Anyon (2011) directly addresses the connections between Marx and schooling. She notes that since the time of Marx, neo-Marxist theorists (including Bowles & Gintis, Gramsci, and Apple among others) have explored the classroom and the inequalities it maintains and produces.
within and outside of school walls through a Marxist lens. She is particularly critical of the common practice in the United States of blaming educators for school and broader economic failures. She rejects this scapegoating and explains that school reform has to be a part of comprehensive policies—including wages, adequate job training, and access to jobs. Rather than creating the broad economic and social reforms that are required for greater equality, Anyon argues these needed changes are masked by blaming schools.

The theoretical root of this dissertation connects Anyon’s conception of neo-Marxist theories and education to understand the ways in which institutions of higher education both enable and obstruct entry into the middle class. In particular, this study’s examination of the ways in which gender, urbanicity, and levels of poverty play out in schooling address the missing aspects of Marx’s theory that neo-Marxists have added into their analysis, including feminist theory and a general consideration of the experience outside that of white males within class structures. As the dissertation explores the ways in which Kepler both alleviates and perpetuates economic inequalities in its efforts to create a Black middle class, the underlying theoretical premise is based on Anyon’s belief that schooling happens in a broader context that the unit of the school alone (with larger political forces and structures intersecting at the school level) and that the experiences of each student will inherently be influenced by his or her identity, including race, gender, poverty status, and urbanicity.

Although neo-Marxist theories of education provide a relevant framework for this dissertation, I also rely on Pierre Bourdieu’s insight into the ways in which higher education creates a middle class. While Marx focuses heavily on production and capital as determinants of class composition, Bourdieu (1986) considers multiple forms of capital beyond the purely economic in “The Forms of Capital.” For Bourdieu, cultural capital refers to the advantages, knowledge, and
schooling that one possesses to access different classes and statuses. While some forms of cultural
capital are gained in school, Bourdieu showed that the majority are derived from family life. Social
capital refers to the networks, relationships, memberships in organization, and connections
individuals have that enable them to maintain their class status. It also dictates behavior within
classes, as well as how individuals relate to one another. The concepts of cultural and social capital
are theoretical frameworks for understanding how these phenomena are manifested in institutions
of higher education.

In Language and Symbolic Power (1991) Bourdieu argues language is not just a means of
communication but also a mechanism of power. When universities in developing countries choose
which language to instruct in, they often choose the colonizer’s language. These choices and the
consequences contribute to an understanding of how language and class intertwine.

Additionally, feminist theory will offer insights into the nexus of institutions of higher
education and women’s role in the creation of the middle class. bell hooks’ Feminist Theory: From
Margin to Center (1984) describes how marginalized voices are often excluded in education, and
she encourages women to advocate for themselves but recognize and appreciate their differences.
She also begins to explore intersectionality, or the crossing of race, class, and gender. hooks notes
that to promote equality, men must be included in the feminist paradigm. She focuses on the
specifics of curriculum and power in Teaching to Transgress: Education as the Practice Freedom
(1994). Of particular note for this study, hooks advocates for a model of university teaching that
engages students in collaboration and relaxation to increase the engagement of all students,
particularly female students.

In partnership with feminist theories, the work of Frantz Fanon offers another layer of
understanding the connection between university education and the creation of the Black middle
class in Africa’s post-Colonial context. Given that Rwanda is a Black country in post-colonial times, Fanon’s framing of the challenges faced by Black individuals in a social world he posits is constructed for Whites, Fanon’s analysis of how students in Rwanda navigate a Western, American university program in their home country offers a framework for understanding how a program like Kepler can both alleviate and perpetuate inequality in its quest to move poor students into the middle class. In Fanon’s seminal work *Black Skin, White Masks* (1986), he employs a metaphor that Blacks must wear “white masks” in order to successfully navigate a world for Whites. In particular, examining Kepler with the theoretical lens that the Black self consistently encounters and endures trauma due to the categorization of others as inferior assists with understanding the ways in which both the staff design and student experience at Kepler is defined in a post-Colonial African country.

Fanon’s four central ideas about the dehumanizing effects of colonialization on the Black mind and body are also considered in the theoretical framework of this dissertation, with a particular focus on the ideas discussed in *A Dying Colonialism* (1967) and in collaboration with Sartre and Farrington in *The Wretched of the Earth* (1965). Briefly, these pieces present four central arguments in relation to the Black post-colonial state: 1) Colonialism normalizes thinking and attitudes of aspiration and debasement towards White people, white culture, and Europe generally, 2) Colonialization promotes adverse attitudes of Blacks towards other Blacks in Africa, 3) Colonialization and its aftermath is so overwhelming that it appears to be the only way of being in the world, and 4) Only through rejecting that colonialization (including its history and present day impacts) will Black men and women be able to depart from the psychological impacts of colonialization that racist phenomenology imposes. It is important to note that, while Rwanda’s conflicts are often described as ethnic, colonialization undoubtedly contributed to these tensions,
thereby rendering Fanon’s theories relevant for consideration in the creation of a Black middle class in a post-Colonial landscape.

**Figure 1: Research Genealogy**

**Literature Review**

There are eight areas of study that provide a background about the role of university education and the development of the middle class. These are: 1) gender and educational attainment 2) urbanicity and educational attainment, 3) poverty and educational attainment, 4) age
and educational attainment, 5) Black middle class, 6) Black middle class in the developing world, 7) education in the developing world, and 8) blended learning.

Gender

This section will briefly outline gender and educational outcomes. First, a the global perspective is described. This description includes both the Western and sub-Saharan contexts. The hardships faced by women and how they impact educational outcomes are focused upon throughout the gender discussion.

Global Perspectives

In high-income countries, there is often a nearly equal enrollment of boys and girls in primary school and 95% as many females attend secondary school as males. In sub-Saharan Africa, and in Rwanda, however, only 60% as many females attend secondary school as males, and, as a result, their achievement lags behind males (Baliamoune-Lutz, 2007). The role of gender and education is of particular interest because of their direct link to economic class—a positive correlation exists between the attendance of girls in school and higher rates of life expectancy and gross national product (World Bank, 2013). Therefore, the enrollment and successful completion of schooling for girls is an essential ingredient in the economic growth of a low-income country like Rwanda.

In sub-Saharan Africa, it is estimated that over 90 million women are illiterate (World Bank, 2013). Formal education for girls and young women lags behind boys and you men because of household poverty; lack of sanitary necessities for girls during menstruation; desire to have women marry at an early age, which sees education as a hindrance to women’s development; and a gendered division of household labor in which domestic chores and care of ailing family members or siblings are women’s responsibility (Arnowe, Torres, & Franz, 2012; Bloch, Beoku-Betts, & Tabachnick, 1998; George, 2016; Jejeebhoy, 1995; Manuh, 1998; Robertson, 1986;
Schultz, 1993). On the whole, it is a confluence of cultural and religious beliefs, social traditions, expectations, biases in families and communities, and economic costs that converge to limit women’s educational opportunities in sub-Saharan Africa, and Rwanda follows this pattern. In addition, some scholars have examined the role of sexual violence in schools as a hindrance to women’s attendance or attainment of a diploma. Sexual violence in schools is one of the lesser discussed reasons for the educational gender gap in sub-Saharan African schools. It is a taboo topic in many countries, but interviews and studies conducted with young women across the continent reveal that sexual violence is a phenomenon that many students are confronting in schools (Alesina, Brioschi, & Ferrara; 2016; Kimani, 2016).

The ways in which labor is allocated in many African societies also limits both female enrollment, participation, and the ability to earn a diploma at all levels of schooling (Wolf, McCoy, & Godfrey, 2016). Women are viewed as the managers of the household and are expected to prioritize child rearing, washing, and cooking. This is further exacerbated in locations where there is a shortage of water, as women are expected to collect and ensure there is enough water in the household (Kuepié & Nordman, 2016). In countries like Rwanda, where water is not readily available in the home and therefore needs to be carried and treated on a daily basis (often on walks spanning several kilometers) it is estimated that a young woman may spend up to 60% of each day collecting water, which means that approximately 200 million collective work hours are spent by women daily collecting water (Jenkins, 2015). The role of women and water in water scarce homes, cities, or countries is particularly problematic for schooling because of the sheer amount of time spent around water, which directly diminished the number of hours available for attending school and studying. Because boys are not expected to engage in water collection or sanitation practices (although they sometimes do, particularly at very young ages) the impact of water scarcity and
location on women’s education is particularly pronounced in countries like Rwanda (Roy & Crow, 2004).

Promoting the growth of gender equality for women’s education has been at the forefront of several educational initiatives and goals across Africa. There is a large body of literature documenting the role that education plays in increasing both women’s empowerment and the productivity of society as a whole, which includes the likelihood that women will immunize their children, lower rates of malnutrition among family members, have fewer and healthier children, and make more proactive decisions about safe sex to reduce the infection rates of HIV/AIDS (Agbemenu, Terry, Hannan, Kitutu, & Doswell, 2015; Behrman, 2015; Ulin, 1992; Watkins, Sello, Cluver, Kaplan, & Boyes, 2014).

There is a well-documented body of literature describing the impact education, outside of health and community benefits, has on the economic well-being of women and society as a whole (Barro & Lee, 1993; Browne & Barrett, 1991; Kabeer, 2016; Klasen, 2002). The World Bank (2013) estimated that the limited educational opportunities for women leading to reduced employment resulted in a .8% reduction in annual per capita growth per year. Had this growth happened over the last 30 years, Africa’s economies would have effectively doubled. In short, a woman’s educational attainment is both tied to her own empowerment and the health of her family and community and is a fundamental component of the engine for economic growth in developing societies.

Rwanda

Rwanda has certainly recognized the importance of women in education and across various civic institutions. The country has made some impressive gains in developing policies to include girls and women in school and civic life, but these policy frameworks have not yet yielded the desired results in education. Girls continue to lag boys in educational enrollment, attendance, and
attainment. These differences become further exacerbated as young Rwandan women move from secondary to tertiary education. Despite the country’s focus on educational policy for women, there are still several socially entrenched practices and obstacles impeding women’s education. Currently, women are not only at lower enrollment rates in tertiary education, but they also lag behind men each year in their national examination scores (Huggins & Randell, 2007). The lack of female attainment in education directly impedes Rwanda’s potential to create a strong Black middle class.

Urbanicity

This section will briefly outline urban versus rural outcomes from a global perspective. Similar to the gender section, both the Western and sub-Saharan contexts are considered. A debate about the origins of the rural versus urban achievement gap is also outlined.

Global Perspective

The gap in educational achievement between urban and rural students is not unique to developing countries. In fact, Adelman (2002) found that since the early 1990s, rural students in the United States evidenced the lower levels of participation in tertiary education. This was further exacerbated when the youth were poor.

Similar trends are found in sub-Saharan Africa, although that academic underachievement is even more widespread in these countries suggests that the urban-rural achievement gap may be even more devastating for rural students in low-income countries. Research done on students in sub-Saharan Africa demonstrates that, similar to the United States, rural education in less developed countries is tied to disadvantages for learning. In all studies conducted on sub-Saharan Africa, urban students consistently outperform their rural counterparts by large margins (Williams, 2005).
There are two major studies documenting the urban-rural achievement gap in sub-Saharan Africa. One was conducted in between 1992 and 2001 on 10 Francophone countries and analyzed the performance on a reading and mathematics test. It found a larger gap between urban and rural student scores than in scores between genders, with rural students greatly underperforming the urban students (Zhang, 2006). Another study was conducted in two cycles, one from 1995 to 1998 and the second from 2000 to 20002. The study included the Southern and Western Africa Consortium for Monitoring Educational Quality (SACMEQ II), 14 different school systems. An analysis of the first data cycle found little difference in gender but significant disparities were found in the reading and mathematics scores by both socioeconomic status (SES) and location (Kulpoo, 1998). Similarly, in the second round of data, there was less of a difference found in gender than in performance related to SES and urbanicity (Zhang, 2006). Rural students performed at much lower levels than their urban counterparts.

Generally, studies examining urbanicity in sub-Saharan African find students from higher SES levels were much more likely to meet minimum threshold scores for sufficient performance in math and English. Students from small towns and larger cities met these standards in much higher proportions than those from rural and isolated areas. Given the high levels of underachievement and a lack of resources, rural students in sub Saharan Africa are at a particular disadvantage, even though they share an achievement gap with more developed countries. Out of 24 industrialized countries studied by Williams (2005), 14 of them demonstrated a lagging performance of rural students in mathematics and literacy when compared with urban students.

Scholars have long debated the root causes of the urban versus rural achievement gap. In short, this debate can be summed up as the effects of school quality versus the characteristics of individuals. An analysis of the SACMEQ II found a large variation in scores in reading literacy in
relation to student SES (Ross & Zuze, 2004). They noted these gaps were greater in low-income countries than in middle-income countries, but there were still significant gaps found in middle-income nations. These findings suggest that in addition to student and family SES, school quality mattered significantly in relation to student achievement. Ross and Zuze found that the availability of school resources and quality of teachers explain the differences in mathematics and reading scores both between and within schools.

Adding to the controversy over school quality versus individualized student characteristics, Foster (1977) found almost four decades ago in the case of developing countries that the disparity in student performance was rooted in the regional disparities rather than in individualized characteristics like ethnicity or social class. Foster then hypothesized that frameworks for understanding the urban-rural gap in rich countries may not be well suited for understanding the gap in developing nations. Heyneman and Loxley (1983) concurred. They analyzed national data sets from the 1970s and concluded that schools play a greater role in determining student learning achievement in poor countries than they do in wealthy countries. The researchers believed that school variance in poorer countries is much higher and therefore the use of materials, trained teachers, and quality is quite different. Therefore, where a child attends school matters much more in a poor country than a wealthier one in terms of student achievement levels. Both researchers’ findings were further confirmed by similar results found in Loxley’s studies of Egyptian schools in the 1980s and Heyneman’s investigations in Ugandan schools in the 1970s. (Heyneman, 1976; Loxley, 1983).

Riddell (1989) challenged Heyneman and Loxley’s findings, on methodological grounds. They expressed concern about Heyneman and Loxley’s use of single-level regression models on hierarchical data with multiple levels due to the complex nature of school systems. Ridell claimed
the single-level models were misapplied and therefore generated erroneous findings. In response, Rubin and Riddell then fitted a multilevel regression approach to data on secondary schools from Zimbabwe and showed that holding constant for a student’s home environment greatly reduced the variance of student performance according to school- or class-level variances.

It is important to note that studies relying on SES for student achievement levels may not fully contradict Foster’s focus on regional inequality. Foster’s contribution to the argument requires an examination beyond individual schools and students to analyze inequalities from a regional view. A resounding feature of education worldwide is the rural-urban gap. The factors that contribute to student achievement have diverse roots in school, the family, and individual characteristics. Therefore, because rural families have fewer economic resources than urban communities—particularly in low-income countries—these students lag in student achievement compared to urban families even when they attend similar schools. However, because children living in rural areas tend to enroll in schools with fewer resources, rural students are subjected to double jeopardy in their achievement and learning opportunities (Zhang, 2006).

Rwanda

In Rwanda, the lag in academic achievement among rural students follows a pattern similarly described in the education literature on sub-Saharan Africa. Students coming from rural backgrounds in Rwanda underperform their urban peers in most aspects of educational measurement, including school enrollment, achievement, national exam scores, and access to tertiary education (Hayman, 2007). Rural students’ lagging achievement means rural Rwandans do not have the opportunity to contribute to the growth of a Black middle class at the same level as their urban peers.
Poverty
This section will briefly outline poverty and educational outcomes from a global perspective. As with both the gender and urbanicity sections above, both the Western and sub-Saharan contexts will be included. This section pays particular attention to the impact poverty has on educational access and outcomes.

Global Perspectives
There is a large body of research confirming that poverty is correlated with several negative outcomes in the academic life of a young person, including discipline problems, health complications that interfere with learning and school attendance, low rates of parent participation, lower academic achievement, a higher likelihood of needing special education services, problems with school readiness, and reduced rates of retention and completion in school (Engle & Black, 2008; Levin, 2007; Ludwig, Ladd, & Duncan, 2001; Raffo, Dyson, Gunter, & Hall, 2007; Tate, 2008). In the United States, there are a large number of studies that demonstrate that the socioeconomic risk factors associated with poverty have negative effects on cognitive development and academic achievement (Brooks-Gunn & Duncan, 1997).

International studies have regularly demonstrated similar relationships between academic outcomes and socioeconomic measures. For example, PISA (Program for International Student Assessment) examines the science, math, and reading scores of 15-year-old students in 43 countries. Additionally, the PIRLS (Progress in International Reading Literacy Study) measured the comprehensive literacy skills of primary school children in 35 countries. In all countries, there was a relationship between test scores and SES. The relationship between SES and academic achievement, known as the “socioeconomic gradient”—where a flatter gradient demonstrates a greater “equity of outcome”—is tied to higher average academic outcomes and a better quality of life (Adams & Wu, 2000). At the international level, the PISA and PIRLS studies conclude that
poverty has a significant impact on educational attainment in primary and secondary school. Additionally, it is important to note these studies demonstrate schools are not equalizers. A socioeconomic gradient is still at play even when there are equal levels of educational attainment. Additionally, test results can hide the gradient if the sample of test takers does not include all students who need to take the test. For example, the Institute of Research and Public Policy did a study that found relatively small differences between high and low SES students who sat for the test. The difference in results were staggering, however, when those who should have sat for the test but had dropped out were included. Initial results were slanted because of an overrepresentation of low SES students that had managed to stay in school (Brownell, Roos, & Fransoo, 2006). By the time students are college aged, the gaps due to poverty that had grown in primary and secondary school, are astounding and achievement often goes unmeasured because the rates of college attendance for poor students are drastically lower than students of a higher SES (Frenette, 2007).

Studies in sub Saharan Africa support the international findings on the negative impact of poverty on educational outcomes (Blum, 2007; Chisholm & Leyendecker, 2008; Grantham-McGregor, Cheung, Cueto, Gleww, Richter, & Strupp, 2007). In the African context, however, the frequency of conflict, the proliferation of refugee camps, increases in the number of orphans due to conflict and HIV/AIDS, and lower government budgets and resources further exacerbate the poverty achievement gap (Hyde, 1993). This is particularly problematic for the enrollment of poor children in the sub-Saharan region, which is not as frequently found in more economically developed countries. In fact, according to the World Bank (2013), 56 million primary and secondary school children are not currently enrolled in school in sub-Saharan Africa, which is about a third of the region’s young population. In African countries where there is a faster pace of
economic growth (for example, Nigeria, South Africa, Ghana, and Kenya) there is also a widening income gap, and poor students are enrolled at half the rate of their richer peers and exhibit much lower levels of academic achievement and completion at primary, secondary, and university levels (Lewin, 2009).

In the sub-Saharan African context, privatized schools serving two purposes have emerged. Where an emerging middle class is dissatisfied with the quality of public education available at the primary and secondary level, parents combine funds to start higher quality schools. This then leaves poorer students with lower quality schools, similar to what is often found in the United States. When students cannot earn scholarships to coveted university spots private universities available only to the middle and upper classes have emerged. Interestingly, these schools are generally lower quality than public universities, and exist to give those with money an option to be educated. This widens the gap in access to education between poor students and their wealthier counterparts (Chisholm & Leyendecker, 2008).

Rwanda

Generally, Rwanda’s trends and outcomes in learning for impoverished children are aligned with international and sub Saharan findings. It is, however, perhaps further complicated by the post-genocide period, where schools were completely decimated, families were ravaged, orphans were numerous, and school or health facilities were few to none, which greatly delayed education outcomes and created staggeringly high numbers of children living in poverty (Hayman, 2005). While the country has experienced rapid economic growth since the genocide, roughly half of the population still lives below the poverty line, meaning that the country is responsible for educating high numbers of poor children who are showing the same problems with enrollment, health, and cognitive development found in the abovementioned studies. In the Rwandan context,
the poverty factors are further complicated for students attending Kepler who were born right before, during, and immediately after the genocide, as there was and still is little mental health care in the country—in the mid-2000s there was only one psychiatrist in the country (Hayman, 2007). Kepler students faced the familiar stressors of poverty but also contended with a post conflict society with few resources.

**Age**
This section outlines age and educational outcomes from a global perspective. Unfortunately, there is a dearth of studies in completed in Africa on age and educational attainment. Therefore, this section focuses mostly on the Western context.

**Global Perspective**
A body of international research suggests that at the university level a student’s age affects student grades and performance. Most of the research shows that older students will earn higher grades than younger students (Douglas & Sulock, 1995; Gramlich & Greenlee, 1993). The impact of age on university grades, though, seems to be minor in comparison to factors like poverty. Several studies indicate that for every one-year increase in a university student’s age, there is an increase of about two to four percentage points in the percentage level of student grades (Borg, Mason, & Shapiro, 1989; Didia & Hasnat, 1998).

Much of the research on age and university success has been conducted in the West. For example, the abovementioned studies were conducted at universities in the United States. Additionally, De La Harpe, Radloff, and Parker (1997) conducted studies demonstrating university grades were positively correlated with student age in Australia. These findings held true at both the community college and traditional four-year university level (Owen, 2003).

**Rwanda**
There is a dearth of literature on age and its relationship to university success in developing countries, including sub-Saharan Africa. It should, however, be noted that due to conflicts,
instability, and limited resources, the age of the average student in Africa in primary, secondary, and tertiary levels is often higher than in nations in the developing world (Blum, 2007). This trend also holds true for Rwandan students (Hayman, 2005).

Black Middle Class
Some scholarly literature focuses on the Black middle class, but it is significantly less than studies on poor and working-class Blacks. Additionally, most research on the Black middle class has been conducted and focused in economically developed nations such as the United States. This literature began with DuBois’s discussion of the, “talented tenth” in The Philadelphia Negro (1967 [1899]). DuBois argued that the professionals of the Black community, such as doctors and lawyers, should be the group to advance Blacks. He also pushed for more Black university-educated teachers so that Black students would have Black teachers. The views of DuBois were sharply contested by many, including Booker T. Washington, who advocated for the primacy of vocational and industrial training to develop the Black community economically (Landry & Marsh, 2011). These differing positions began a series of fiery debates on the best methods to advance Black communities in the United States.

While DuBois and Washington’s debate spurred discussions about the Black middle class, the term wasn’t introduced into scholarly literature until 1925, by E. F. Frazier. In his many works (1930, 1955, 1957) he documented the growth of the Black middle class through various methods, including demography and economics. Notably, he compared Black and White businesses, which led him to deeply criticize the American Black middle class, arguing that they may be even worse off than the Black working class because they felt and acted as if they were inferior to Whites. While Frazier was perhaps one of the greatest critics of the psychological status of the Black
middle class, he did not fully ignore the systematic impact of segregation and racism on the formation of the Black middle class (Landry & Marsh, 2011).

Following this early scholarship, scholars explored several themes about the Black middle class in the United States, including understanding class and caste, the significance of race and the formation of the Black middle class, social and economic mobility (focusing on 1962-73 and after 1973), an analysis of the careers of middle-class Blacks and Whites, racial and ethnic income levels, wealth accumulation, segregation, and availability of private and public space (Thomas, 1993; 1995; Wilson, 1997; Grodsky & Pager, 2001; Attewell et al., 2004).

Additionally, professional, economic, religious, educational, and organizational affiliations played a central role in not only filling the gaps that segregation in the United States caused, but also contributing to the economic and social growth of the Black middle class (Hine, 2003). These institutions not only advanced the rights of Blacks, but also addressed needs in health care, women’s rights, and the navigation of social struggles. Particular to the university setting, Black fraternities enabled educational achievement and growth of the Black middle class. Similarly, the creation of networks centered on school, church, professional, economic, social, and educational institutions also served to not only fill a gap opened by White exclusion, but also to enrich the social life and middle class development of many Black citizens in the United States (Haynes, 2005). While various social relationships played a role in the development of the Black middle class, in comparison to other races, educated, middle-class Blacks often face challenges that their peers do not, including the downward educational mobility of their children, lower marriage/cohabitation rates, which serve to decrease household incomes, and unequal pay (Pattillo-McCoy, 1999; Grodsky & Pager, 2001; Loury, 2002; Battle et al., 2006).
In fact, researchers have noted that a middle-class status does not preclude specific challenges and stressors, including discrimination, particularly in public places (Landry & Marsh, 2011). While middle-class Black Americans have experienced an increased in access to educational and residential choices, Black middle class Americans still experience inequality (Landry, 1987). In fact, middle-class Black Americans experience anger, stress, and hopelessness; they feel sometimes threatened, followed in retail stores and treated differently than their economically similar but racially different peers in restaurants and other businesses (Cose, 1993).

Given no racial divide in Rwanda that mirrors the United States—the divide, as outlined in chapter 3, is more economic turned ethnic—conditions differ from the United States, but a body of literature debates the importance of class in race relations in the United States. Wilson (1978) claimed that class actually supersedes race in the post-Civil Rights era. To support his position, he claimed Black college graduates had at minimum an equal—and in some cases, a better—chance to earn middle-class jobs. This argument received both praise and criticism. While it won the American Sociological Association’s prestigious Sydney Spivak Award. It also met harsh opponents (Marrett, 1980; Pettigrew, 1980; Willie, 1978).

While research on the Black middle class in the United States may seem outside the scope of this project, this research strives to create a blueprint for NGOs, INGOs, and governments where there is currently a small but growing Black middle class. Therefore, it is important to learn from (and avoid) the pitfalls of the Black middle class in countries where one already exists. Additionally, because the institution examined in this dissertation grants students a degree from the United States and includes management and partnerships in the United States, a direct link exists between the students at Kepler and the United States.
The Black Middle Class in the Developing World

If examining the Black middle class in developed nations is on the fringe of Black studies in the United States, it is almost non-existent in the context of developing nations. The few existing studies tend focus on countries such as Brazil, India, and other developing nations, which have rapidly growing economies (Kharas, 2010).

African countries are rarely the focus of studies about the middle class. Generally, the few instances are limited to South Africa, Kenya, Ghana, or Nigeria. Of these countries, South Africa is most frequently studied, and research often focuses on race relations and the country’s history of Apartheid (Kringe, 2012; Burger et al., 2014). The limited literature focusing on Africa suggests that scholars often wait until an economy is already at a high growth rate to study the emergence of a Black middle class. There are limited studies on how countries in the earlier stages of economic growth, such as Rwanda, grow a Black middle class before an economic burst. This leaves a great gap in the understanding of how countries emerging out of poverty work in building a middle class. Additionally, of the literature that exists on the Black middle class in Africa, the central area of focus is defining the characteristics of the group (Robeyns, 2005; Khunou, 2102; Burger et al., 2014). There is little information about how university education or innovative models in education in Africa contribute to the growth of an emerging middle class in a developing economy.

Even though there is a limited body of literature on the Black middle class in Africa, the emergence of scholarly work in developing nations moving towards middle-income status sheds light on the role and importance of a Black middle class in a developing nation. For example, Kharas (2010) discusses the ways in which a middle class in both developed and developing nations drives the global economy. He adds that even though developing nations may provide
goods to middle-class citizens in developed nations, that production can be the impetus to the
growth of a middle class in developing nations.

Kharas (2010) also discusses both the definition and importance of the middle class in
avancing nations throughout history. Defining the middle class presents an ambiguity—and this
particularly ambiguity is amplified in developing nations. Being middle class is the ability to lead
a comfortable life. Comfort can include stability in housing, educational opportunities (including
higher education) for children, access to retirement, security in employment, access to healthcare,
and discretionary income for leisure. Outside of the purely economic and lifestyle factors of
belonging to the middle class, there is the idea that the middle class has contributed to societies for
centuries. Middle-class thinking and influence began with the bourgeoisie in the late 1300s, with
the often criticized and often lauded ideas about economic materialism, which was the catalyst for
trade between nation states and the expansion of a capitalist market economy. Subsequently, the
middle class has often been cited as the source of innovation and entrepreneurship through the
building up of small businesses that make modern economies flourish.

Lastly, Kharas (2010) outlines the importance of middle class values—hard work, thrift,
and education—for developing nations. Essentially, the middle class supplies the needed inputs
for growth in developing nations: fresh ideas, accumulation of physical capital, and accumulation
of human capital. According to Kharas, history demonstrates that no developing nation can move
forward without a strong middle class.

**Education in the Developing World**

Education in the developing world faces various challenges, including lack of
infrastructure, limited funding, political instability, achievement gaps between boys and girls,
limited teacher training, and struggles to access quality materials (Graham-Brown, 1991). Many
developing countries are still addressing issues of basic access to primary education, which means that institutions of higher education may receive less attention and funding. While attention to primary and secondary education has created positive outcomes, the dire circumstances at the basic levels of the educational system means that higher education in the developing world has suffered from a lack of attention spanning several years. It has also, in the case of many developing countries, become an institution available only to the elite (Chapman & Austin, 2002).

While few will argue with the need to provide basic educational services in under-resourced countries, the lack of attention to higher education is problematic because it is central to progress and upward mobility. Universities are, in fact, a core part of the world’s shift into a knowledge-based economy, even if there are several noted pitfalls (including outdated pedagogies, constrictive scheduling, and a lack of connectivity to the labor market needs), universities in both the developed and developing world in addressing this shift (Moursed, Farrell, & Barton, 2013; Flores, Matkin, Burcach, Quinn, & Harding, 2012). Institutions of higher education are also essential to the development because they hold repositories of the knowledge and progress of society, are a source of research, and provide training and a platform for the interpretation and understanding of knowledge (Chapman & Austin, 2002). Therefore, if developing countries are to reach their ambitious goals and move forward as civic polities and economically, university education is an essential ingredient in this progress. University education in the developing world is not only challenging because of a lack of attention and financial resources but also because as the world, countries, and university systems themselves become more complex, developing universities that can keep pace with a rapidly changing world is difficult.

Finances have been a particular challenge for the developing world in relation to institutions of higher learning. Specifically, with many institutions in developing nations reliant
on donor funding to survive, international assistance agencies have made a priority of primary and secondary education and put few resources into higher education since the 1980s. The result has been decades of neglect in universities in countries such as Rwanda (Chapman & Austin, 2002).

While many international donors have paid little attention to university education, a shift in priorities has occurred in the last ten years due to six factors (Chapman & Austin, 2002; World Bank Reports, 2013). First, economic globalization has changed the work environment to one where skills are needed for a knowledge-based economy. The world has evolved to where knowledge is capital and information is the currency of exchange. Second, success in increasing primary school enrollment and graduation rates has increased the demand for university education. This has fed into a third shift, where increased rates of primary and secondary school education have led to an employment skills gap when students don’t have access to tertiary education. The fourth factor leading to a shift towards tertiary education is a change in national political systems. Governments are heading towards more democratic approaches to governance rather than a centralized system. This means universities are reimagining and restructuring their relationships with governmental entities. Fifth, higher education is now becoming entwined with other areas of interest receiving public funds, including HIV/AIDS, generational poverty, rapid growth in urbanization, and environmental issues. Last, technological advances are opening new and innovative methods in delivering higher education (Burbules & Callister, 2000).

The convergence of these six factors means that there are both huge difficulties and opportunities in higher education. On the problematic side are a rapid increase in demand clashing with immense financial constraints, rapidly changing and sometimes unstable political environments, entrenched international aid systems, and the usual resistance to institutional or organizational change. On the other hand, technology and a slight shift in attention and some
limited funding provide tremendous opportunities for innovation and addressing the needs of developing societies. It will be both a great opportunity and challenge to examine how governments, funders, NGOs, and institutions of higher education design responses that are economically feasible, culturally relevant, manageable operationally, and effective strategically.

With all of the challenges that education faces in the developing world, many of the brightest students attend university outside of their home countries. This “brain drain” hinders economic growth when the most talented university graduates stay in the countries in which they study (Pang et al., 2002).

**Higher Education in Rwanda**

There is a small body of literature on higher education in Rwanda. It focuses on the general structure of Rwandan universities, language instruction, gender, genocide curriculums, and information and communication technology in higher education. Both the Rwandan government and the small number of studies done on Rwandan higher education note that there is a need to increase the skills students gain in higher education to be better prepared for employment. A number of reforms have been enacted, particularly in rebuilding the system in the post-genocide era (Lassibille & Tan, 2005; Mazimpaka & Daniel, 2000; Mbabazi, Dahlgren, & Fejes 2012; MINEDUC, 2010; Williams, Abbott, & Mupenzi, 2015). While significant efforts have been expended towards improving the higher education system, particularly in the post-gendocide era, significant challenges remain in the areas of instructor quality, skills relevance, emphasis on theory over practicality, language instruction, and a lack of funds (Andersson, Kagwesage, & Rusanganwa; 2013).

Given Rwanda’s rapid switch from French to English in 2008 and Kepler’s choice to instruct in English, the complexity of language, power, and schooling in Rwanda take on an added
importance. Unlike many African countries where colonizers arbitrarily drew borders that included several tribes and languages, in Rwanda almost all citizens speak the native Bantu language, Kinyarwanda, regardless of ethnicity. Speaking Kinyarwanda is an essential element of Rwandan identity (Samuelson & Freedman, 2010). Even though Rwandans are not allowed to identify as Hutu, Tutsi, or Twa (which are the 3 ethnic groups of Rwanda, tied to conflict and the country’s genocide) there is a tie between ethnic identity and language in Rwanda based on historical and political events in the country.

Prior to 2008, the official languages of Rwanda were French and Kinyarwanda. In 2008, using the typical hierarchical leadership in Rwanda, President Paul Kagame switched the official language to English. Kagame, who is credited with leading the rebel effort to stop the genocide in 1994, came from Uganda and was an English and Kinyarwanda speaker. Historical and political events often tie countries of residence and language to certain ethnic groups; in Rwanda, one can guess with fair accuracy if one is Tutsi or Hutu according to where one has lived in relationship to the 1994 genocide. For example, an individual who lived in Rwanda before the war, in Burundi during the war, and speaks French and Kinyarwanda is likely a Tutsi. Another who lived in Rwanda before the war, in Tanzania during the war, and speaks French and Kinyarwanda is likely Hutu. Those who lived in Rwanda before the genocide, went to Uganda during the war, and returned and are English speakers are usually Tutsi. There are several combinations of both language and location that often offer clues to Rwandans about their identity. Thus, language is often tied closely to identity in the Rwandan context (Hintjens, 2008).

Therefore, when Kagame switched the language to English, it created a shift from a previous French speaking elite to an English-speaking elite group in the government and in civil society (Samuelson & Freedman, 2010). This not only caused a stir in the government, but greatly
affected Rwandan schools as well. While there is a significant body of literature that explores and supports the view that using English as a medium of instruction assists students in accessing jobs in a globalized economy, a rapid switch to English with an untrained teaching force can cause difficulties with students being able to read, write, and speak Kinyarwanda, English, or French fluently. The government has promised that the change to English will open more job opportunities both in the East African Community and globally. It has also promised several improvements in schools. Teachers and researches find it likely, however, that the government’s promised outcomes may not be realized by young Rwandans, many of whom never fully learned French in school. Most schools lack basic supplies (including textbooks), teachers lack systematic support in learning English, and they are teaching a language they do not speak themselves. And conversational English, which generally takes up to seven years to acquire, is quite different than academic English (Rutayisire, Kabano, & Rubagiza, 2004).

As with any policy decision, there will be those who benefit from the government’s new English policy. For example, those who already know English because of their historical movement or home country will be at an advantage. On the other hand, those who lack access to English instruction will have a hard time finding success in secondary school, let alone in a university setting. The Anglophone elite created by Kagame’s switch to English will ensure it can replicate its current success and leadership in the government (Samuelson & Freedman, 20010).

Schools that switched during 2008 showed the hectic nature of changing languages with limited support. Most teachers were using a single textbook for up to 60 pupils written in a language they couldn’t speak. Classrooms communicated a combination of English, Kinyarwanda, and French, “Kinyarflanglais.” As a result, many students coming to university are unable to read, write, or speak any of the three languages fluently.
Blended Learning

Kepler’s university program utilizes blended learning—a method of teaching and learning that includes components of in-person and on-line instruction—in its efforts to graduate students that will provide the basis for Rwanda’s Black middle class. This new field of instructional study includes three central theories of understanding how blended learning works in a school setting, which are exploring, explaining, and designing (Picciano, 2014).

Blended learning has a debate filled history beginning in the 1960s, with advocates noting the advantages of combining technology and in person instruction, and those against it arguing that just because there’s more technology in a program, that within itself doesn’t automatically improve learning (Moskal et al., 2013). There are several categories of blended learning (Picciano, 2014) and a variety of ways that universities implement blended learning models (Mayadas & Picciano, 2007; Graham et al., 2013). In institutions of higher learning, blended learning can work to address a myriad of student, faculty, institutional, city, and country needs including inadequate classroom space, limited access to content expertise, needs for collaboration, and space for innovation (Garrison & Kanuka, 2004; Dziuban et al., 2004; Bonk & Graham, 2006; Allen & Seaman, 2011). Blended learning is most successful when, aligned with an institution of higher learning’s goals, the needs of students, faculty, and the institution are considered and the program is designed to meet those goals (Brier, 2012; Moskal et al., 2013).

When the U.S. Department of Education compared student learning in online courses, in person courses, and blended courses, it found, although the evidence was not fully conclusive, that students did well in blended learning courses (Means, Toyama, Murphy, Bakia, & Jones, 2010). Additionally, the different modalities of teaching and learning that technology enables means teachers can address different types of learners, and quick data analytics can identify both students...
in need of early interventions and assistance in specific areas as well as those that are ready for advanced instruction (Zhao et al., 2005; Juwah, 2006). Simply introducing technology without changes in pedagogy, however, will not improve learning outcomes (Angrist & Lavy, 2002; Banerjee et al., 2007; Barrera-Osorio & Linden, 2009). Systematic training, thoughtful preparation, and continuous examination are imperative for an effective blended program to produces high academic outcomes.
Chapter 3: METHODOLOGY

This dissertation is an evaluative case study examining how innovations in university education lead to the creation of a Black middle class in a developing country. My hypothesis is that if the innovations in university education are implemented in a similar method as those at Kepler, that both the social and innovative academic and employment supports will indeed lead to the creation of a Black middle class in a developing country. I use three core sources of retrospective data to test my hypothesis in this case study: 1) quantitative data on Kepler test performance versus a matched control group, 2) qualitative interview data on the first cohort of Kepler students, and 3) ethnographic data collected on the Kepler program. Before reviewing the methodology used for the three sources of data, this chapter will give a brief overview of standpoint theory and the researcher’s background to frame the lens from which all data sources were observed. Additionally, I will give a brief synopsis of the history and culture in Rwanda and the Kepler University Program. Finally, this chapter will delineate the methods used to understand the role of university education in the creation of a Black middle class in a developing country.

Researcher Background

According to standpoint theory, each researcher and his or her identity are uniquely positioned in relationship to the subject and goals of the study (Harding, 1987). In particular, class, race, gender, dis/ability, and life experiences influence how an individual understands the world and the lens the researcher uses to approach and analyze data. I will outline my identity, role, and how I became involved with this research project.

I am a White female who was raised in a middle- to upper-middle-class family. I attended high quality public schools and was the product of what is often on the list of America’s top ten most racially divided cities, Muskegon, Michigan. I was inundated with the conservative views of
my community; namely believing the wealthier, white part of town had “worked hard” for what they had and that the poorer, Black part of town existed because of individual laziness and inferiority. I was oblivious to the ways in which educational, political, and historical inequalities had shaped both my hometown, country, and world as a whole.

Attending the University of Michigan flipped my understanding of the world upside down. In particular, through a demography class focusing on the city of Detroit, I began to see society’s larger forces at work shaping the grossly unequal landscape of American cities and towns. This learning and my location, coupled with Supreme Court affirmative action cases during my attendance at the University, placed me in an environment where the inequalities of America’s educational system were continuously dissected. Consequently, my 18 years of piecing together the world were shattered. Once I caught my breath from these (what should not have been—but were) stunning realizations, two things happened: 1) I realized often my race had often been on a side of history of which I didn’t feel particularly proud. Even though I couldn’t change that, I could try and make individual choices to be on the better side of history moving forward; and 2) Since my own thinking completely changed—right down to my true core values of how I understood the world—I deeply experienced and believed in the transformative effect of a quality education.

I was accepted into the Honors College after my sophomore year and was therefore able to design my own major, which I entitled “Social Organization and Minority Communities,” and chose my own course path to graduation, which included political science, sociology, and psychology courses from the perspective of often marginalized groups in the United States. I wrote my Honors thesis on my hometown, outlying the historical circumstances that lead to such deep inequality and shared it with anyone who would listen. Researching, understanding, and writing about my home’s history in the realms of demography, education, and politics were both painful
and therapeutic. They allowed me to grapple with both my town’s past and my own identity. I realized my studies and topics of research were not just for understanding and knowledge sharing. They needed to be deeply personal and connected to the ideologies underpinning how I was beginning to both analyze and dismantle inequality in the world. The research was deeply personal, and I knew I always wanted any research I might tackle to remain in both the personal and social justice driven realm.

I spent a lot of time studying, talking, and writing about inequality at the University of Michigan and through the help of a brilliant advisor, ended up postponing my path to law school to participate in the New York City Teaching Fellows program. It was enough talking and theory—it was time for me to take a try at something actionable to be on the “better” side of history. To that end, I taught bilingual special education in the Bronx for four years. While the students could at times be challenging, the real problem for me was the administration, a lack of resources and technology for the students, and nonsensical bureaucratic processes that distracted me from giving the students the attention and care they deserved. While I knew I didn’t know everything after four years (and that a lot of experienced educators would smirk at best) I felt I could create systems and structures at a school that would much better serve the students than what I currently experienced in my teaching assignment.

Therefore, I applied to Mayor Bloomberg’s (sometimes controversial) scholarship principal training program, the NYC Leadership Academy, and wrote a proposal to start a school. The core ideology of the school was moving students (almost all black and brown boys) out of special education and using technology—ensuring that each student had a laptop and teachers were trained in the latest educational technology techniques—to ensure student success. After the second year, our East Harlem public middle school was at the 95th percentile for achievement.
results. The technology was a ton of hard work (as was having 40% special education students since all of the neighboring charters kicked those students out) but the approach was not only working, it was excelling. After four years of leading the school, and ten years of working for the New York City Department of Education, I was ready for a new challenge. The school was doing well, we had an identified successor. I started asking around my network to see if there were interesting opportunities using innovations in technology to change the lives of marginalized groups. My former boss asked, “Are you willing to move to Rwanda?” and after hearing about the project, I took a deep breath said “yes” to moving my life to a place I had never visited.

Kepler is a new university program, and I was the leading manager, hired to launch it in September 2013. The program offers a full scholarship to students, including housing, a laptop, healthcare, and a living stipend. Kepler utilizes blended learning (a combination of in-person and on-line learning) with a new competency based program called College for America for Rwanda’s brightest and neediest students to earn a degree from the United States. I loved the project, how immensely challenging it sounded both academically and operationally, that there was an open slate to develop the curriculum, and that it addressed my own self-interest in working on projects on the “better” side of history. The United States (and rest of the world’s) appalling inaction during the genocide while we knew what was happening was shameful, and no amount of Bill Clinton’s teary apologies will save the million lives lost over three months and the remaining 8 million lives living with the scars of genocide. This project, however, offered me the honor of creating something to rebuild Rwanda’s future. After a rigorous interview process, I signed on as Kepler’s chief academic officer. As the team’s only female manager (and also only non-Ivy league graduate) I was and still remain hyper aware of how gender and the workplace functions in both school and work settings. While the work with students was extremely rewarding at Kepler, as was learning
how to run a university program in a culture new to me very humbling, the work with the board, who were almost all White, privileged, Ivy-league grads, was often ideologically difficult. I was often at odds with the board, and felt they did not understand the lives and needs of our students. My differences with the board kept me acutely aware of how it feels to be on the other side of a system where one is at a disadvantage. And, while my life has unquestionably been advantaged and privileged in many ways, experiencing a “lesser” level of privilege than our board members helped me stay in sync with both how my students might perceive me, as well as the ways in which being part of a systematically less advantaged group can wear on one psychologically.

My experiences as a White woman growing up in a relatively privileged life influenced my perspectives on Rwanda and this study. My life experiences taught me firsthand the transformative power of education as well as the life-changing impact of technology on the processes and outcomes of teaching and learning. My deep desire is to understand how society’s systems and structures work to undermine certain groups in society and then take concrete steps within my life to dismantle the impact of some of those systems. Those desires underlie my need to do something that endures—both in my work and my research.

Rwanda Overview

Rwanda is a small land-locked country in the middle of Africa, roughly the size of Maryland. It shares its borders with the Democratic Republic of the Congo, Burundi, Uganda, and Tanzania. It is not the kind of African country often portrayed in movies, where corruption runs rampant, wild jungles abound, and failed-nation states wreak havoc on the population. Instead, every slice of land is divided into small farms, livestock graze on pastures, and millions of peasants scrape out a living farming bananas, sorghum, beans, and coffee. Rwanda is the most densely populated country in Africa, and whether in the city or countryside, people are seen almost everywhere. It is
in both these urban and rural areas that the government holds a relatively tight grip on almost all aspects of civilian and civic life. The country is comprised of 1% Twa, 14% Tutsis, and 85% Hutus, although Rwandans are officially not allowed to identify according to these groups following government mandates after the country’s violent conflicts. Almost all Rwandans (over 98%) speak Kinyarwanda, a Bantu language. As of 2008, the country switched from French to English as its second official language.

The majority of recent studies on Rwanda examine the 1994 Genocide, when 800,000 to 1 million minority Tutsis and Hutus not supporting the genocide regime were killed in a period of 100 days by Hutu extremists. The violence of the Rwandan Genocide sent a sixth of its people into refugee camps and killed another sixth of the population, making it one of the most violent events seen in modern Africa (Stearns, 2011).

Researchers have extensively debated the origin of Rwanda’s historical divide between Hutus and Tutsis. The two most commonly explored theories ask whether the genocide was ethnically based or rooted in economic class. The Twa were the original settlers in Rwanda from roughly 800 BC, and Bantu migrations began between 700 and 1500 BC. From the Bantu migration until the present day, the Twa has been a marginalized group, struggling over land ownership, education, and economics. Accounts of Bantu migration offer different theories about Hutu and Tutsi classifications. One theory of migration claims that Hutu arrived in present-day Rwanda first and were later followed by Tutsis from a Cushitic region, creating a separate racial group (Prunier, 1995). An opposing theory chronicles the migration of Hutu and Tutsis happening simultaneously and over a long period of time, with no one group dominating the other during migration and settlement. In this theory, the classification of Hutus and Tutsis arose through an
economic distinction, where Tutsis were the economic elite. The debate about the origins of the Hutu-Tutsi divide is still active (Chrétien, 2003).

While the roots of Hutu-Tutsi divisions are contested by some, I reject the argument that Hutus and Tutsis originated from distinct ethnic groups. Instead, evidence that the groups were founded on economic differentiations is, in my opinion, rooted in facts and overall sound reasoning. Because of evidence that a classification that began as economic and grew into an “ethnic group” is at the root of understanding the classifications and divisions in Rwanda, the country provides insights into the development of a Black middle class in Rwanda.

Kepler serves Tutsi, Hutu, and Twa students. They constitute the political, social, and educational fabric of Rwanda both historically and in the present. To understand Rwanda without understanding the origins of economic-turned-ethnic classifications of citizens in relation to university education and the formation of a Black middle class is similar to understanding the United States of America without taking into account the role that slavery and race relations had in the present economic outcomes of different groups in American society. And, while Rwanda has a current rhetoric of “we are all one,” any Rwandan or foreigner who has spent a significant amount of time living there knows this rhetoric functions slogan-like to demonstrate progress to outsiders rather than a lived social, economic, or civic reality.

For centuries prior to colonialization, an elite minority of aristocrats and royal families, known as Tutsis, ruled Rwanda as a monarchy. The Tutsis governed the masses of peasants, who were known as Hutus (Prunier, 1995). The elasticity these categories suggests, however, that the social division between Tutsis and Hutus was more economic than ethnic; through shifts in social or economic standing or intermarriage, Tutsis could become Hutus and Hutus could become Tutsis
Precollonial Rwanda has no record of systematized “ethnic” violence between Tutsi and Hutu.

That both German and subsequent Belgian colonizers utilized and exacerbated the Hutu and Tutsi divide to achieve their own goals, thereby directly contributing to the tensions that ultimately lead to the genocide is relatively uncontested. European colonizers saw the differences between the two groups as universal. They saw Tutsis as having Ethiopian features and lean builds, and labeled them as a “Hamitic” or Nilotic people, and presumed them to be naturally superior to the Hutus, who were labeled as “Negroid.” For the colonialists, the Hutus were deserving of oppression because of their perceived Bantu origins (Lemarchand, 2009). Presently, while physical characteristics have some basis in reality, they do not present a reliable system for identifying Hutus or Tutsis on an individual basis. European colonizers, however, went so far as to measure the sizes of noses to shift their identifications from economic to ethnic. In 1935, Belgian colonizers introduced “ethnic” identity on ID cards, ensuring individuals would be assigned immutable identities. This was a great shift in Rwanda’s identity from the past, when Hutus changed to Tutsis if their economic status increased (generally through the ownership of cows) or vice-versa. ID cards enabled the formalization of a relationship in which Tutsis functioned as lords over Hutu vassals, and daily life resembled an apartheid system. Administrative, career, and educational opportunities were kept exclusively for Tutsis. It is against this backdrop that the first incidences of systematic violence between Hutus and Tutsis began to occur in Rwanda starting in 1959. The ethnic identification on cards created during colonialization was often used to determine actions and killings during Rwandan conflicts after independence (Straus, 2004).

While Rwanda is most famous for its 1994 genocide, there were several lesser-known conflicts leading up to the explosion of violence in 1994. Since independence in 1959, incidences
of violence and tensions between Hutus and Tutsis were intermittent. Tensions escalated in 1994 when the president’s plane was shot down on April 6. Following the crash, a genocide immediately ensued, and over the course of 4 months, 800,000 to 1 million Tutsi, moderate Hutus not supporting the genocide regime, and moderate Twa were slaughtered, mostly through simple weapons like machetes and other farming tools.

**Summary of Primary, Secondary and Post-Secondary Education in Rwanda**

Educationally, Rwanda’s system was completely destroyed and disrupted during the genocide, but it has also recovered significantly. The system is composed of compulsory primary and secondary education. Roughly 6% of eligible university aged students are currently enrolled in tertiary education.

Primary school in Rwanda is compulsory, free of charge, and lasts 6 years. Junior secondary school is 3 years, and senior secondary school is also 3 years. Instruction is in Kinyarwanda in primary school and English in secondary school (although English was made the official language in 2008, French is still used in some schools). At the end of junior secondary school, which is also compulsory, students take a test in 9 subjects. If the student fails, he or she can either choose to attend a private school or repeat the third year of junior secondary.

Compulsory school ends with junior secondary school, and entrance into the country’s 734 senior secondary schools is competitive. Most Rwandan students attending senior secondary do so at a public boarding school, although there are also some private schools. Entrance into the public schools is more competitive than in private schools, and public schools are considered to be a higher quality than private ones, which anyone can attend if they are able to pay.

Students take general reading, writing, math, science, and humanities courses through junior secondary school. In senior secondary school, students begin to specialize in one of the following
areas: 1) social sciences and humanities, 2) visual arts or home economics, 3) technical, 4) business, 5) agriculture, or 6) math and science. Grades are given as percentages and As (80-100%) are rare. At the end of senior secondary school, students take a national exam, on which it is difficult to obtain high scores.

In terms of higher education, there are 23 universities in Kigali. There’s an enrollment of almost 27,000 students with 39% female. The universities are specialized according to areas and fields (for example engineering, education, social sciences). While the system has grown significantly since the 1960s and again after the 1994 genocide, the quality of courses and instruction is often under scrutiny. None of the universities have a graduation rate after four years higher than 50% (and some hover around 10%).

**Summary of the Current Structure and Function of the Rwandan Economy**

Historically, Rwanda’s economy has been largely based on agriculture, and this remains true in present-day Rwanda, with 80% of the population relying on agriculture for survival and the primary source of income. While the country has traditionally struggled economically, the 1994 genocide devastated Rwanda’s economy by not only halting local agricultural and small businesses and decimating the country’s infrastructure, but also making any foreign investors weary of the country due to safety issues. However, the country has made a relatively fast turnaround from the horrific events of 1994 and has averaged 7-8% GDP growth each year since the conflict. For this reason, the country’s rebuilding and economic growth are often lauded by development organizations and international governments. Rwanda reduced its level of poverty from 57% to 45% in 2010, but more than 60% of the population still lives on less than $1.25 a day, which is classified as extreme poverty by the World Bank (Hutt, 2016). Most of the country eeks out a living through sustenance farming, and even though there is fertile soil, production
can’t keep up with the population growth, meaning much of the country’s food has to be imported. The major exports of Rwanda are coffee and tea.

Since the genocide, Rwanda’s economy has been heavily reliant on foreign aid, and currently 30-40% of the budget comes from aid. This means the country is susceptible to world economic fluctuations and how they impact aid. Additionally, some countries have reduced their aid following unfavorable reports about Rwanda’s political behavior in the region. For example, in 2013 the UN released a report outlining evidence that Rwanda backed rebels in the Democratic Republic of the Congo. Following, Belgium drastically reduced its foreign aid, and the country’s growth nearly halved for the year, resting at out 4.3% (Hutt, 2016).

In terms of foreign investment, tourism has been Rwanda’s lead revenue generator, which has increased with the international community’s understanding that Rwanda is a safe place following the rebuilding post 1994. Rwanda is one of three countries where mountain gorillas can be viewed, and nearly a million visitors came to the country in 2016. This, in combination with a national forest in the south and safari in the East have meant an increase in service and tourist oriented jobs. Additionally, the country completed a convention center in 2016, which is projected to host several African conferences and continue to grow the country’s service economy. Outside of coffee and tea exports and tourism, there is a fair amount of minerals that are exported, although some reports suggest those minerals are smuggled from the Democratic Republic of the Congo.

Of central importance to this dissertation in relation to understanding Kepler in the context of building a middle class, Rwanda is currently classified as a low-income country, but one of the central goals of the government’s Vision 2020 program is to move Rwanda to a
middle-income status. To do this, the government is creating and focusing on economic initiatives that emphasize technological progress, low corruption rates, gender equality, an increase in privately-led industries, and regional economic integration. Essentially, Rwanda’s leadership aims to move the country from agrarian to a knowledge-based, service-oriented economy. This means the government has aimed to create an environment that is friendly to start-ups, technologically based businesses, and open to foreign investment. Therefore, there are companies working on solar electricity, tourism, conference services, technological apps, and other entrepreneurial endeavors. While many of these companies are still emerging and may struggle, it is within these pockets that Kepler aims to place internships and assist students in getting jobs. Additionally, given the country’s heavy reliance on aid money, non-profit and charitable organizations will continue to be important places of internship and job placement for Kepler students. However, while these companies are the primary area of focus for Kepler placements, there are several students identifying opportunities in the agribusiness sector, where shifting to larger and more efficient modes of production could open opportunities for Kepler students. On the whole, while the government is pushing to shift the economy, Rwanda is still deeply rooted in agriculture and is battling high levels of poverty. As Kepler grows, it will be interesting to observe how many jobs that may lead to a middle-class lifestyle will be available to graduates.

Case Study
This dissertation analyzes Kepler’s innovative approach to education and its ability to contribute to a growing Black middle class through a case study. The purpose of case studies is to understand a specific case (or sometimes cases) in its real-world context. Case studies aim to gain an in-depth
understanding about either a person, organization, event, program, or social group to produce new knowledge about behavior in the real world, and to analyze its meaning (Bromley, 1986). Researchers utilizing the case study method collect detailed information from a variety of sources of data and various collection procedures for an extended period of time, although cases are bounded by both time and activity (Stake, 1995). This definition has also been amended by more recent theory on case studies, namely that a case study is not only about the product of inquiry but also about the process of inquiry (Denzin & Lincoln, 2002). The topic of this dissertation—understanding the role of university education in the creation of a black middle class in a developing nation—is particularly well suited for a case study because of the unique way in which case studies allow for the study of a process (Merriam, 1998). Since, “case studies help us to understand processes of events, projects, and programmes and to discover context characteristics that will shed light on an issue or object” (Sanders, 1981) a case study of Kepler can explore both the creation and building process of a new innovative university that intends on moving poor students into the middle class through multiple sources of data.

There are multiple forms of data (described below) that were triangulated for this evaluative case study on Kepler. As a case study researcher, I utilized R. K. Yin’s theoretical approach (2003) to case study data analysis. In his explanations of case study analysis, Yin advocates consistently returning to any propositions utilized in the research. In this dissertation, the proposition is that innovations in university education can lead to the development of a Black middle class and that the program will likely both alleviate and perpetuate inequality. Therefore, as each piece of data is analyzed, I come back to these propositions. Yin suggests this is an effective method of analysis for a case study for three reasons: 1) it ensures the focus of the case study. Multiple forms of data collected can lead to analyses superfluous to the original intent of the
2) Consistent exploration of a researcher’s proposition means that rival propositions are also considered, which may lead to new explanations and understanding of the phenomena studied. 3) This process, when done iteratively, increases confidence in the findings. Both original and competing propositions are considered, included, or rejected.

Yin also notes that there is a danger in considering each piece of data within a case study independently and reporting on it separately. While each data sources and its system of analysis is described later in this chapter, I have consistently kept in mind that the purpose of a case study is to ensure the data are brought together to understand Kepler as an overall case--not its various parts nor the specific factors that influence the Kepler case. To do this, I asked both colleagues and participants in the program to provide feedback on my ability to fully integrate multiple data sources to answer the original research question.

Since I am intimately tied to the project that I was studying, I explored the existing body of research to achieving confidence in my evaluative findings on Kepler. Since the 1980s, various methods have been published to assess critically the general quality of qualitative research: of confirmability, dependability, and transferability of data (Sandelowski, 1986, 1993; Krefting 1991) on rigor and trustworthiness of case studies as well as qualitative data generally (Guba, 1981; Lincoln & Guba, 1985). From this body of research, I sought to ensure the highest level of trustworthiness in the findings and general overall quality of the study by, first, providing adequate details so that readers can independently assess the validity or credibility of the evaluative findings. At the foundational level, this included ensuring that the research question for the case study was clearly written, propositions were provided, that the case study was appropriately designed for the research question, the application of purposeful sampling procedures, the systematic collection
and management of data, and correct analysis of the data (Russell, Gregory, Ploeg, DiCenso & Guyatt, 2005).

Much of the research on case study methodology indicates that the principles of adequate case study design automatically lend themselves to the inclusion of strategies that promote the credibility of data (Baxter & Jack, 2004). In the design and methodology of this dissertation I employed the Triangulation of data—sources, types, and researchers—to ensure credibility. The goal of the triangulation was to ensure the research question and related concerns were viewed from multiple perspectives. Data sources, researchers, and the comparison and collection of data enhanced data quality based on the principles of idea convergence to both challenge and confirm findings (Knafl & Breitmayer, 1989). The suggestion behind most research on the trustworthiness of case studies is that data should be collected and analyzed over a prolonged period of time. I pulled data for the Kepler case study from its inception in 2013 through 2016. This ensured that multiple perspectives were considered, which in turn added to the credibility of the evaluative findings (Krefting, 1991). Additionally, as data was analyzed, my interpretations of the data were shared with the participants, and they had the opportunity to contribute new or additional perspectives on the study.

Another strategy to ensure the trustworthiness of the findings included keeping reflection notes on the data findings. During these reviews, while data was analyzed, multiple researchers independently coded a set of data and then came together to discuss the findings. The group would then work to find consensus on the emerging codes and categories of the research. Additionally, I would code data at a set point in time, and then after a period of two months, return to the same set of data to recode it and compare the results (Krefting, 1991).
Data
This section will describe the data collected and utilized for this dissertation. This includes a quantitative analysis summary, with a thorough discussion of the dependent and independent variables. A thorough qualitative analysis summary is also provided.

Quantitative Analysis Summary
Data were drawn from an analysis of the Kepler University program in Kigali, Rwanda. The study compared learning outcomes of students at other Rwandan universities in Kigali and Kepler. IDinsight, a company providing data and research on social impact projects around Africa and the developing world, conducted the study. These data were relevant to the case study because before ultimately judging the institution they supplemented qualitative observations made in the case study to describe and explain Kepler. Additionally, since the qualitative data compares Kepler students to those attending other universities, they added nuance to the case study. While all of the qualitative data came from within Kepler, the quantitative portion allowed for a comparison with other university students. It therefore added to the case study’s ability to judge Kepler’s role in the creation of a Black middle class.

The data included a comparison of Kepler’s first year of students (N=48) with a control group of students attending traditional universities (N=100). The comparison group was selected by screening over 500 students attending traditional universities in Kigali. From this group, 200 students that best matched the demographics of Kepler students were selected. The 200 students were administered a survey on background characteristics, which determined the selection of the final control group. The covariates used to match students included gender, age, ubudehe (a government measure of poverty) belief in ability to progress out of poverty, high school grades, and national exam scores.
Dependent Variables

The study measured the performance of Kepler students and the control group on the Collegiate Learning Assessment (CLA +), Scholastic Level Exam (SLE), and a computer literacy test. The CLA+ is a critical thinking test, which measures the ability to evaluate and make arguments, quantitative and scientific analysis, problem solving, and writing. The test is three hours long and consists of a performance task and selected response questions. The performance task requires students to construct an essay response analyzing primary source documents to solve a problem. This portion of the test is two hours in length. The remaining hour of the test is selected response questions that demand an analysis of supporting documents through multiple-choice questions.

The SLE is a multiple choice measuring basic reasoning, mathematics, and English language performance. It is similar to the ACT and SAT exams, but shorter. The computer literacy test consists of typing, effective Internet research, and performing a variety of tasks in Microsoft Word.

The quantitative portion of this dissertation focuses on the performance of Kepler students against a group of matched students attending traditional universities in Kigali on all three tests. IDinsight also conducted a midline analysis, but only baseline and endline scores will be compared.

The dependent variable for this study is the difference in performance from term 1 to term 3. There are four variables within this analysis: performance on the CLA+ exam, SLE, the computer knowledge test, and a composite of all three exams.

Independent Variables

This research included a series of bivariate analyses; appropriate bivariate tests were run to compare the performance of different groups that are related to the formation of the middle
class. The performance of boys and girls was measured, since the social and economic
development of a nation are directly related to the advancement of women (World Bank, 2013).
Gender performance is of particular interest for Rwanda and other sub-Saharan nations, which
have some of the world’s highest poverty and lowest literacy rates and girls’ academic performance
significantly lagging behind that of boys. Women’s education in sub-Saharan Africa are marked
by deficiencies in three areas: 1) enrollment, 2) grade repetition and dropout (wastage), and 3)
actual levels of educational attainment (King & Hill, 1997). Although Rwanda and other sub-
Saharan Africa countries have struggled with the development of and access to quality education
programs, they have also made significant progress when compared to other developing countries.
No sub-Saharan countries, however, have realized equal levels of male and female student
advances—for example, in secondary schools, curricular disparities still exist, with women being
offered less exposure to math and science (Anikpo, 2000).

A comparison in achievement scores was also run between urban and rural students. This
is of particular interest for the development of the Black middle class because studies have shown
that in sub-Saharan Africa, there is often higher academic achievement in urban schools, as well
as more resources and higher-quality teachers (Lee et al., 2005). Additionally, the connection
between socio-economic status and attendance in rural schools in sub-Saharan Africa has also been
studied. Notably, primary school students in rural areas consistently underperform their
counterparts in urban areas, leading to lower attendance and achievement in higher education
(Zhang, 2006).

Student exam performance according to ubudehe categories, or the Rwandan government’s
measurement of poverty status, was also compared. It is well documented around the world that
poverty interferes with educational achievement, which is true for sub-Saharan Africa and Rwanda
as well. Specifically, the region struggles with household income levels and uneven enrollment in secondary schools. In higher education, wealth is the most powerful determinant of participation and progression through a program of study until graduation (Lewin, 2009).

Age is another independent variable that will be measured. Because of interrupted education, due to personal problems or regional instability, sub-Saharan children in school tend to be 2-5 years older than those in the United States or Asia. This delay can lead to lower academic achievement levels (Lewin, 2009). This holds true for university students in Kigali today, many of whose educations were interrupted by school closings during and after the genocide. Understanding differences in age performance helps in determining the likely makeup of the Black middle class according to age.

Both national exam scores and secondary school grades were measured as independent variables. An extensive body of research indicates either or both variables are tied to university success. Additionally, several researchers have examined if and which of these are the greatest predictors of university success (Baldwin, 1994). Because most of these studies were conducted in European or American settings, analyzing these independent variables in the Rwandan context offers a view into how national exam scores and grades influence access to the university setting.

Student belief in the ability to progress out of poverty is the last independent variable measured. The study of non-cognitive skills such as grit, perseverance, and a belief in improving one’s future have recently exploded in the United States. Recent literature shows that these non-cognitive factors are important in predicting the success of Black males attending predominately White colleges in the United States (Cuyjet, 2006; Strayhorn, 2013). Recent studies have shown that, other than race, personality traits such as grit and self-discipline may be the greatest indicators
of academic success in college students (Duckworth, Peterson, Matthews, & Kelly, 2007; Singh & Jha, 2008; Komarraju, Karau, & Schmeck, 2009).

Qualitative Analysis
In this case study, several qualitative data sources, including direct observations, interviews, documents, participant-observation, and document analysis of articles, meeting notes, and agendas, describe and explain Kepler through an ethnographic lens.

Direct Observations
Direct observations were utilized to understand the social place of the Kepler campus in Kigali, as well as in Rwanda, to understand and describe the nature of the program, and to understand the processes in the development of a university that enable the creation of a Black middle class. Direct observations were made of classrooms, students during their “free” study time on campus, in student housing, teacher meetings, and management meetings. All of these observations focused on the experiences of the participants, and namely the ways different players in the institution interact to create an innovative university program.

Direct observations added nuance to the qualitative and quantitative data already collected, as well as providing a perspective on conflicting data. The major findings were reported, and analyzed through triangulation with the other data sources in the study.

Interviews
Student focus group interviews by IDinsight in 2013-14 addressed seven areas: 1) Kepler’s academic support structures, 2) levels of student stress and ability to handle challenges, 3) program impact on personal and academic development, 4) student housing, 5) how the program differs from other universities, 6) how students found out about the program, and 7) what Keper needs to improve. Fifty students were interviewed, selected by the dimensions that added depth to the quantitative indicators measured (profiles covered gender, urban vs. rural students, and student achievement levels). Participants were recruited from those who took part in the quantitative
analysis. These interviews enabled a further elaboration of the issues brought up in the quantitative analysis and in ethnographic observations. I also used them to validate the results of the quantitative analysis.

**Participant Observation**

The benefits of utilizing participant observation are well studied and documented (Anyon, 1997; Becker, Geer, Hughes, & Strauss, A., 1961; Becker, 1970; Blum, 1970; Carter, 2004; Flores-Gonzalez, 2002). Participant observation can provide data collection unavailable through other methods (Katz, 1997). For example, at Kepler, the researcher can compare “espoused theory versus “theory in use,” or how one acts with what they say (Argyris & Schon, 1974). Participant observation at Kepler provided an opportunity to explore and verify what participants stated in interviews and explore what happens at Kepler in a contextualized manner.

I analyzed participant observation data to develop a model to make sense of what the students at Kepler do. As suggested by Katz, the goal of the participant observation data is to create a model of culture within the Kepler campus, not to tell a “truth” about the data collected. This is especially relevant for participant observation, because there is no single “truth” but various truths when the multiple perspectives of teachers, students, and community members are considered.

I utilized Spradley’s (1979) approach to analyze the data from the participant observations. In this system, organized an outline of the information collected and then moved the different points from the outline to the other relevant points of data and theories of the study. Additionally, I used Spradley’s method of organizing the collected data into a story in which a specific day or week of the lives of students could be told. My purpose was to paint a cultural scene of the Kepler experience. Last, I asked participants to help structure the narrative report and ensure that the data accurately reflect the experiences of participants, which allows them to add nuance and details that the participant observer may have missed (Lincoln & Guba, 1985).
Participant observations allowed me an understanding and account of how students and staff conceptualize and navigate the connection between education and the middle class—whether their actions were intentional (or advantageous or disadvantageous) or not. This information cannot be gathered from interviews, focus groups, or quantitative data alone.
CHAPTER 4: FINDINGS

This chapter will describe the findings of the study as follows: chapter 4a, IDinsight quantitative data findings, the results of Kepler student performance against a matched control group on three separate tests and the performance of various subgroups on the exams; chapter 4b, IDinsight qualitative data findings, interview responses of students participating in the Kepler program, including student self-perception as well as strengths and weaknesses in the program from the student perspective will be addressed by various domains; chapter 4c, ethnographic data findings, observations made at a traditional university in Kigali, Rwanda and direct observations of the Kepler program. The experiences of the students, expectations of the school, and use of technology will be among the central themes explored.

Chapter 4a: IDinsight quantitative data findings

This dissertation examines how innovations in higher education create a middle-class citizenry in developing countries. From a quantitative lens, this question is examined by using data from IDInsight, a research company that Kepler partnered with in 2013 to understand how well the Kepler Kigali model influenced student learning outcomes. I compared the performance of students in the Kepler model with those attending traditional Rwandan universities. Kepler approached this study acknowledging their model was radically different than other universities and in many ways an experiment. It wanted to understand if the model was having the desired effects when compared with traditional universities. It wanted to know whether a reorientation in pedagogy was necessary. IDInsight performed the study with two central goals: 1. to inform Kepler of the impact of the program on student learning during the first year of the program compared to peers at other Rwandan universities, and 2. to understand qualitative differences between Kepler and traditional universities. Chapter 4a uses the quantitative data generated to address the first goal.
of the study to determine how innovations in university education function to create a black middle
class in a developing country.

Overview of the IDinsight Quantitative Study

In the qualitative portion of the study, since the pool of applicants meeting Kepler’s
admission criteria was not large enough for randomized admissions and a randomized control trial
was not possible, IDinsight used a matching design that allowed for a rigorous examination of a
small group of a first cohort of students. Therefore, propensity score matching was used to identify
applicants that were likely to have attended Kepler. Key covariates were used to do a logistic
regression to determine the probability that a student would attend Kepler. Covariates were years
of computer use, expected earnings after graduation, poverty level, gender, age, previous
employment, secondary school type, secondary school grades, and urbanicity. This ensured a
group as similar as possible to Kepler students for IDinsight to make comparisons. The
comparative goal was to ensure differences in outcomes resulted from Kepler itself, not other
factors.

The academic effectiveness of the Kepler program was measured by computing the
difference of average test results at the end of the first year of university between students at local
universities and Kepler students and subtracting the difference of those average test results from
the October 2013 exams. Analysis of covariance (ANCOVA) was used to estimate the average
treatment effect, whereby a regression was run to determine a relationship between the comparison
group and the treatment group. This analysis included important covariate controls such as family
background, student achievement, age, and gender. To determine if the differences were
statistically significant, p-values were computed from the regressions.
To select the comparison students for the study, IDinsight recruited a pool of over 500 students were from four universities in Kigali, three of which were university of Rwanda Colleges: the College of Business and Economics, the College of Education, and the College of Science and Technology. A private university, Adventist University of Central Africa, was also included. From the pool of 500, IDinsight selected 100 students that best matched Kepler students (according to the covariates) for the endline evaluation.

Students were selected to resemble Kepler’s admissions criteria. Similar covariates were national exam scores, the last year of high school grades, age, and ubudehe (the Rwandan government’s community-based poverty measurement). Students who passed the cut off were invited to take a survey and series of exams to match Kepler and comparison students. IDinsight matched them on the following ten variables: 1) expected earnings five years after graduation, 2) expected earnings immediately after graduation, 3) years a student has used a computer, 4) private versus public secondary school, 5) previous employment, 6) parents’ living status, 7) Progress Out of Poverty Index (PPI), 8) Urbanicity (before attending university), 9) gender, 10) age. IDinsight performed the matching process to reduce the differences on the central covariates, which are hypothesized to be linked to educational performance, as measured by the exams the students take.

Dependent Variables

As described earlier, the quantitative portion of this dissertation focuses on the performance of Kepler students compared to a group of matched students attending traditional universities on three tests. IDinsight also conducted a midline analysis, but only baseline and endline scores will be compared. The dependent variable for this study is the difference in performance from term 1

---

1 PPI is a numeric value estimating the probability that a respondent lives below, or above by a narrow margin, the national food poverty line and/or national poverty line. See www.progressoutofpoverty.org for more information on this metric.
to term 3. There are four variables within this analysis: performance on the CLA+ exam, performance on selected CLA+ questions, performance on the SLE, and performance on the computer knowledge test. The computer knowledge test includes a composite of internet search skills, evaluating the ability to find reliable information on the internet, using Microsoft Office (including PowerPoint, Excel, and Word), navigating features of a computer, and a typing test.

Table 1A and Table 1B present descriptive statistics of means, standard deviations, ranges, and descriptions of variables for the treatment (Kepler) students and comparison students. This table allows for univariate analysis of the distribution of single variables. Tables 1A and 1B provide a summary of the study population.

**CLA+ Exam**
In October 2013, the comparison group of students attending traditional universities in Kigali scored 699.57, and Kepler students scored 737.10. There was no statistically significant difference in the scores. This also held true for the April 2014 test, when the control group scored 737.72, and Kepler students scored 745.04.

**CLA+ selected response questions**
The comparison group of students scored 699.51 in October 2013, and the Kepler students scored 793.25, with a p-value of .01, the level to which Kepler outperformed the control group at a statistically significant level. This held true on the April 2014 test, where the comparison group scored 768.48 and Kepler students scored 862.71, again with a p-value of .01.

**Scholastic Level Exam (SLE)**
In October 2013, the comparison group scored 8.01, and Kepler students scored 10.14. With a p-value of .05, this was statistically significant. This did not hold true, however, for the
April 2014 administration of the test, when the control group scored 11.29 and Kepler students scored 10.97. The difference was not statistically significant.

**Typing Speed Test**

The comparison group students scored 8.06 on the typing speed test, and the Kepler students scored 15.19 in the October 2013 administration. With a p-value of .001, Kepler students outperformed the comparison group at a statistically significant level. This held true in the April 2014 administration of the test, when the comparison group scored 11.16 and Kepler students scored 22.19. Again, with a p-value of .001, the Kepler students outperformed the comparison group at a statistically significant level.
Table 1A. Adjusted Means, Standard Deviations, and Ranges for Treatment Students

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Mean</th>
<th>S. D.</th>
<th>Range (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dependent Variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>CLA+ Performance Task</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 2013</td>
<td>48</td>
<td>737.102</td>
<td>21.384</td>
<td>695.2 - 779.0</td>
</tr>
<tr>
<td>April 2014</td>
<td>48</td>
<td>745.045</td>
<td>28.565</td>
<td>689.1 - 801.0</td>
</tr>
<tr>
<td><strong>CLA+ Selected Response Questions</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 2013</td>
<td>48</td>
<td>793.251</td>
<td>22.634</td>
<td>748.9 - 665.8</td>
</tr>
<tr>
<td>April 2014</td>
<td>48</td>
<td>862.706</td>
<td>20.746</td>
<td>822.0 - 903.4</td>
</tr>
<tr>
<td><strong>Scholastic Level Exam</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 2013</td>
<td>48</td>
<td>10.140</td>
<td>0.648</td>
<td>8.9 - 11.4</td>
</tr>
<tr>
<td>April 2014</td>
<td>48</td>
<td>10.968</td>
<td>0.744</td>
<td>9.5 - 12.4</td>
</tr>
<tr>
<td><strong>Typing Speed</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 2013</td>
<td>48</td>
<td>15.189</td>
<td>0.689</td>
<td>13.8 - 16.5</td>
</tr>
<tr>
<td>April 2014</td>
<td>48</td>
<td>22.187</td>
<td>0.981</td>
<td>20.3 - 24.1</td>
</tr>
<tr>
<td>Variable</td>
<td>N</td>
<td>Mean</td>
<td>S. D.</td>
<td>Range (95% CI)</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>----</td>
<td>--------</td>
<td>--------</td>
<td>------------------</td>
</tr>
<tr>
<td><strong>Dependent Variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>CLA+ Performance Task</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 2013</td>
<td>98</td>
<td>699.573</td>
<td>15.210</td>
<td>669.8 - 729.4</td>
</tr>
<tr>
<td>April 2014</td>
<td>98</td>
<td>737.723</td>
<td>18.436</td>
<td>701.6 - 773.9</td>
</tr>
<tr>
<td><strong>CLA+ Selected Response Questions</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 2013</td>
<td>98</td>
<td>699.510</td>
<td>17.204</td>
<td>837.6 - 733.2</td>
</tr>
<tr>
<td>April 2014</td>
<td>98</td>
<td>768.481</td>
<td>14.050</td>
<td>740.9 - 796.0</td>
</tr>
<tr>
<td><strong>Scholastic Level Exam</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 2013</td>
<td>98</td>
<td>8.013</td>
<td>0.487</td>
<td>7.1 - 9.0</td>
</tr>
<tr>
<td>April 2014</td>
<td>98</td>
<td>11.291</td>
<td>0.423</td>
<td>10.5 - 12.1</td>
</tr>
<tr>
<td><strong>Typing Speed</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 2013</td>
<td>98</td>
<td>8.055</td>
<td>0.533</td>
<td>7.0 - 9.1</td>
</tr>
<tr>
<td>April 2014</td>
<td>98</td>
<td>11.158</td>
<td>0.438</td>
<td>10.3 - 12.0</td>
</tr>
</tbody>
</table>
### Table 1C. Comparison of Means on Respondent in Treatment by Independent Variable

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Respondent in Treatment</th>
<th>No</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CLA+ Performance Task</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 2013</td>
<td>699.57</td>
<td>737.10</td>
<td></td>
</tr>
<tr>
<td>(98)</td>
<td>(48)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>April 2014</td>
<td>737.72</td>
<td>745.04</td>
<td></td>
</tr>
<tr>
<td>(98)</td>
<td>(48)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>CLA+ Selected Response Questions</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 2013</td>
<td>699.51**</td>
<td>793.25</td>
<td></td>
</tr>
<tr>
<td>(98)</td>
<td>(48)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>April 2014</td>
<td>768.48**</td>
<td>862.71</td>
<td></td>
</tr>
<tr>
<td>(98)</td>
<td>(48)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Scholastic Level Exam</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 2013</td>
<td>8.01*</td>
<td>10.14</td>
<td></td>
</tr>
<tr>
<td>(98)</td>
<td>(48)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>April 2014</td>
<td>11.29</td>
<td>10.97</td>
<td></td>
</tr>
<tr>
<td>(98)</td>
<td>(48)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Typing Speed</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 2013</td>
<td>8.06***</td>
<td>15.19</td>
<td></td>
</tr>
<tr>
<td>(98)</td>
<td>(48)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>April 2014</td>
<td>11.16***</td>
<td>22.19</td>
<td></td>
</tr>
<tr>
<td>(98)</td>
<td>(48)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* * p = .05, ** p = .01, *** p = .001

The independent variables in this study were grouped into six domains: 1) gender, 2) urbanicity, 3) age, 4) ubudehe (poverty measure), 5) national exam scores and grades, 6) progress out of poverty (PPI). These domains were chosen after reviewing the literature on student and university school factors affecting movement into the Black middle class.
Males

Table 2A displays the adjusted means, standard deviations, and ranges for Kepler male students, and Table 2B shows the same data for comparison male students. The comparison of means on Kepler male respondents by independent variable is displayed in Table 2C.

In the October 2013 administration of the CLA+ performance tasks, the comparison male students scored 699.78 and Kepler males scored 700.00. There was no statistically significant difference in their scores. This held true for the April 2014 administration of the test, when the comparison male students scored 776.30 and Kepler males scored 769.57.

On the CLA+ selected questions test administration in October 2013, Kepler students outscored the comparison group with a p-value of .05, indicating a statistically significant difference in the scores. The comparison group scored 692.52, and Kepler males scored 812.19. There was no statistically significant difference, however, in the male scores on the April 2014 administration of the same test—comparison students scored 775.26 and Kepler students scored 868.69.

The Scholastic Level Exam (SLE) did not show a statistically significant difference in the scores of comparison and Kepler male students in the 2013 or 2014 administration of the test. On October 2013, the comparison group scored 8.75, and Kepler males scored 10.86; in April 2014 comparison males scored 12.56, and Kepler males scored 11.65.

Last, there was a statistically significant outperformance by Kepler males on the typing speed test on both the 2013 and 2014 administrations of the test, with both test dates yielding a p-value of .001. In October 2013, the comparison males scored 8.75, and Kepler males scored 15.87. In August 2014, comparison males scored 11.57, and Kepler males scored 23.15.
<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Mean</th>
<th>S. D.</th>
<th>Range (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CLA+ Performance Task</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 2013</td>
<td>26</td>
<td>770.004</td>
<td>29.634</td>
<td>711.9 - 828.1</td>
</tr>
<tr>
<td>April 2014</td>
<td>26</td>
<td>769.574</td>
<td>32.684</td>
<td>705.5 - 833.6</td>
</tr>
<tr>
<td><strong>CLA+ Selected Response Questions</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 2013</td>
<td>26</td>
<td>812.186</td>
<td>32.970</td>
<td>747.6 - 876.8</td>
</tr>
<tr>
<td>April 2014</td>
<td>26</td>
<td>868.690</td>
<td>36.263</td>
<td>797.6 - 939.8</td>
</tr>
<tr>
<td><strong>Scholastic Level Exam</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 2013</td>
<td>26</td>
<td>10.856</td>
<td>0.747</td>
<td>9.4 - 12.3</td>
</tr>
<tr>
<td>April 2014</td>
<td>26</td>
<td>11.653</td>
<td>0.925</td>
<td>9.8 - 13.5</td>
</tr>
<tr>
<td><strong>Typing Speed</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 2013</td>
<td>26</td>
<td>15.869</td>
<td>1.033</td>
<td>13.8 - 17.9</td>
</tr>
<tr>
<td>April 2014</td>
<td>26</td>
<td>23.155</td>
<td>1.480</td>
<td>20.3 - 26.1</td>
</tr>
</tbody>
</table>
Table 2B. Adjusted Means, Standard Deviations, and Ranges for Male Comparison Students

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Mean</th>
<th>S. D.</th>
<th>Range (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dependent Variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CLA+ Performance Task</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 2013</td>
<td>54</td>
<td>699.776</td>
<td>18.955</td>
<td>662.6 - 736.9</td>
</tr>
<tr>
<td>April 2014</td>
<td>54</td>
<td>776.297</td>
<td>21.350</td>
<td>734.5 - 818.1</td>
</tr>
<tr>
<td>CLA+ Selected Response Questions</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 2013</td>
<td>54</td>
<td>692.522</td>
<td>23.228</td>
<td>647.0 - 738.0</td>
</tr>
<tr>
<td>April 2014</td>
<td>54</td>
<td>775.261</td>
<td>22.347</td>
<td>731.5 - 819.0</td>
</tr>
<tr>
<td>Scholastic Level Exam</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 2013</td>
<td>54</td>
<td>8.754</td>
<td>0.612</td>
<td>7.6 - 10.0</td>
</tr>
<tr>
<td>April 2014</td>
<td>54</td>
<td>12.556</td>
<td>0.504</td>
<td>11.6 - 13.6</td>
</tr>
<tr>
<td>Typing Speed</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 2013</td>
<td>54</td>
<td>8.748</td>
<td>0.692</td>
<td>7.4 - 10.1</td>
</tr>
<tr>
<td>April 2014</td>
<td>54</td>
<td>11.567</td>
<td>0.618</td>
<td>10.4 - 12.8</td>
</tr>
</tbody>
</table>
Table 2C. Comparison of Means on Male Respondents in Treatment by Independent Variable

<table>
<thead>
<tr>
<th>Independent Variables by Test Date</th>
<th>Respondent in Treatment</th>
<th>No</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>CLA+ Performance Task</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 2013</td>
<td>699.78</td>
<td>(54)</td>
<td>770.00</td>
</tr>
<tr>
<td>April 2014</td>
<td>776.30</td>
<td>(54)</td>
<td>769.57</td>
</tr>
<tr>
<td><strong>CLA+ Selected Response Questions</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 2013</td>
<td>692.52*</td>
<td>(54)</td>
<td>812.19</td>
</tr>
<tr>
<td>April 2014</td>
<td>775.26</td>
<td>(54)</td>
<td>868.69</td>
</tr>
<tr>
<td><strong>Scholastic Level Exam</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 2013</td>
<td>8.75</td>
<td>(54)</td>
<td>10.86</td>
</tr>
<tr>
<td>April 2014</td>
<td>12.56</td>
<td>(54)</td>
<td>11.65</td>
</tr>
<tr>
<td><strong>Typing Speed</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 2013</td>
<td>8.75***</td>
<td>(54)</td>
<td>15.87</td>
</tr>
<tr>
<td>April 2014</td>
<td>11.57***</td>
<td>(54)</td>
<td>23.15</td>
</tr>
</tbody>
</table>

* p = .05, ** p = .01, *** p = .001

**Females**

Table 3A displays the adjusted means, standard deviations, and ranges for Kepler female students, and Table 3B shows the same data for comparison female students. The comparison of means on Kepler female respondents by independent variable is displayed in Table 3C.

In the October 2013 administration of the CLA+ performance tasks, the comparison female students scored 686.92, and Kepler females scored 723.02. There was no statistically significant
difference in their scores. This held true for the April 2014 administration of the test, when the comparison females scored 776.30 and Kepler female students scored 769.57.

For the CLA+ selected questions test, there was no statistically significant difference in the scores of comparison females and Kepler females in the October 2013 administration. Comparison females scored 701.11, and Kepler females scored 785.05. During the April 2014 administration, however, comparison females scored 759.07, and Kepler females scored 857.81. With a p-value of .01, Kepler females outperformed comparison females at a statistically significant level on the CLA+ selected questions examination.

The Scholastic Level Exam did not show any statistically significant difference in the scores of comparison and Kepler female students in the 2013 or 2014 administration of the test. On October 2013, the comparison group scored 7.59, and Kepler females scored 8.32; in April 2014 comparison females scored 9.83, and Kepler females scored 9.98.

There was a statistically significant outperformance by Kepler females on the typing speed test on both the 2013 and 2014 administrations of the test, with both test dates yielding a p-value of .001. In October 2013, the comparison females scored 7.09 and Kepler females scored 14.62. In August 2014, comparison females scored 10.90 and Kepler females scored 20.55.
Table 3A. Adjusted Means, Standard Deviations, and Ranges for Female Treatment Students

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Mean</th>
<th>S. D.</th>
<th>Range (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dependent Variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>CLA+ Performance Task</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 2013</td>
<td>22</td>
<td>723.019</td>
<td>39.315</td>
<td>646.0 - 800.0</td>
</tr>
<tr>
<td>April 2014</td>
<td>22</td>
<td>710.888</td>
<td>49.022</td>
<td>614.8 - 807.0</td>
</tr>
<tr>
<td><strong>CLA+ Selected Response Questions</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 2013</td>
<td>22</td>
<td>785.051</td>
<td>32.467</td>
<td>721.4 - 848.7</td>
</tr>
<tr>
<td>April 2014</td>
<td>22</td>
<td>857.810</td>
<td>22.885</td>
<td>813.0 - 902.6</td>
</tr>
<tr>
<td><strong>Scholastic Level Exam</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 2013</td>
<td>22</td>
<td>8.323</td>
<td>0.862</td>
<td>6.6 - 10.0</td>
</tr>
<tr>
<td>April 2014</td>
<td>22</td>
<td>9.983</td>
<td>1.348</td>
<td>7.3 - 12.6</td>
</tr>
<tr>
<td><strong>Typing Speed</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 2013</td>
<td>22</td>
<td>14.616</td>
<td>1.024</td>
<td>12.6 - 16.6</td>
</tr>
<tr>
<td>April 2014</td>
<td>22</td>
<td>20.552</td>
<td>1.299</td>
<td>18.0 - 23.1</td>
</tr>
<tr>
<td>Variable</td>
<td>N</td>
<td>Mean</td>
<td>S. D.</td>
<td>Range (95% CI)</td>
</tr>
<tr>
<td>--------------------------------------</td>
<td>----</td>
<td>-------</td>
<td>--------</td>
<td>----------------</td>
</tr>
<tr>
<td><strong>Dependent Variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>CLA+ Performance Task</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 2013</td>
<td>44</td>
<td>686.922</td>
<td>24.017</td>
<td>639.9 - 734.0</td>
</tr>
<tr>
<td>April 2014</td>
<td>44</td>
<td>692.965</td>
<td>25.030</td>
<td>643.9 - 742.0</td>
</tr>
<tr>
<td><strong>CLA+ Selected Response Questions</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 2013</td>
<td>44</td>
<td>700.997</td>
<td>28.794</td>
<td>644.6 - 757.4</td>
</tr>
<tr>
<td>April 2014</td>
<td>44</td>
<td>759.072</td>
<td>16.526</td>
<td>726.7 - 791.5</td>
</tr>
<tr>
<td><strong>Scholastic Level Exam</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 2013</td>
<td>44</td>
<td>7.589</td>
<td>0.743</td>
<td>6.1 - 9.0</td>
</tr>
<tr>
<td>April 2014</td>
<td>44</td>
<td>9.826</td>
<td>0.676</td>
<td>8.5 - 11.5</td>
</tr>
<tr>
<td><strong>Typing Speed</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 2013</td>
<td>44</td>
<td>7.090</td>
<td>0.691</td>
<td>5.7 - 8.4</td>
</tr>
<tr>
<td>April 2014</td>
<td>44</td>
<td>10.900</td>
<td>0.705</td>
<td>9.5 - 12.3</td>
</tr>
</tbody>
</table>
Table 3C. Comparison of Means on Female Respondents in Treatment by Independent Variable

<table>
<thead>
<tr>
<th>Independent Variables by Test Date</th>
<th>Respondent in Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
</tr>
</tbody>
</table>

*CLA+ Performance Task*

<table>
<thead>
<tr>
<th></th>
<th>October 2013</th>
<th>April 2014</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>686.92 (44)</td>
<td>723.02 (22)</td>
</tr>
<tr>
<td></td>
<td>692.97 (44)</td>
<td>710.89 (22)</td>
</tr>
</tbody>
</table>

*CLA+ Selected Response Questions*

<table>
<thead>
<tr>
<th></th>
<th>October 2013</th>
<th>April 2014</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>701.00 (44)</td>
<td>785.05 (22)</td>
</tr>
<tr>
<td></td>
<td>759.07** (44)</td>
<td>857.81 (22)</td>
</tr>
</tbody>
</table>

*Scholastic Level Exam*

<table>
<thead>
<tr>
<th></th>
<th>October 2013</th>
<th>April 2014</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>7.59 (44)</td>
<td>8.32 (22)</td>
</tr>
<tr>
<td></td>
<td>9.83 (44)</td>
<td>9.98 (22)</td>
</tr>
</tbody>
</table>

*Typing Speed*

<table>
<thead>
<tr>
<th></th>
<th>October 2013</th>
<th>April 2014</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>7.09*** (44)</td>
<td>14.62 (22)</td>
</tr>
<tr>
<td></td>
<td>10.90*** (44)</td>
<td>20.55 (22)</td>
</tr>
</tbody>
</table>

* p = .05, ** p = .01, *** p = .001

*Urban*

Table 4A displays the adjusted means, standard deviations, and ranges for Kepler urban students, and Table 4B shows the same data for comparison urban students. The comparison of means on Kepler urban respondents by independent variable is displayed in Table 4C.
On the CLA+ performance task, the comparison group of urban students scored 718.91, and the Kepler urban students scored 811.14 on the October 2013 test. With a p-value of .05, Kepler urban students outperformed the comparison group at a statistically significant level. This did not hold true, however, for the April 2014 administration of the test, when the comparison group of urban students scored 740.04 and Kepler students scored 772.94; there was no statistically significant difference in their test scores.

On the CLA+ selected question, administration in October 2013 the comparison group of students attending traditional universities in Kigali scored 717.26, and Kepler students scored 794.72. There was no statistically significant difference in their test scores. In the April 2014 administration, however, Kepler students outscored the comparison group at a statistically significant level, with a p-value of .05. The comparison group scored 770.93, and Kepler urban students scored 880.46.

The Scholastic Level Exam did not show any statistically significant difference in the scores of comparison and Kepler urban students in the 2013 or 2014 administration of the test. On October 2013, the comparison group scored 9.36 and Kepler urban students scored 8.81; in April 2014 comparison urban student scored 12.40, and Kepler females scored 11.24.

Finally, on the typing performance test, the comparison group of urban students scored 8.89, and Kepler students scored 15.83. This was a statistically significant difference at the .001 level. This did not hold true, however, for the April 2014 administration of the test, when there was no statistically significant difference between the two groups—the comparison group of urban students scored 12.55, and Kepler students scored 23.25.
Table 4A. Adjusted Means, Standard Deviations, and Ranges for Urban Treatment Students

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Mean</th>
<th>S. D.</th>
<th>Range (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dependent Variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>CLA+ Performance Task</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 2013</td>
<td>25</td>
<td>811.143</td>
<td>24.352</td>
<td>763.4 - 858.9</td>
</tr>
<tr>
<td>April 2014</td>
<td>25</td>
<td>772.937</td>
<td>35.061</td>
<td>704.2 - 841.7</td>
</tr>
<tr>
<td><strong>CLA+ Selected Response Questions</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 2013</td>
<td>25</td>
<td>794.725</td>
<td>29.651</td>
<td>736.1 - 852.8</td>
</tr>
<tr>
<td>April 2014</td>
<td>25</td>
<td>880.463</td>
<td>28.003</td>
<td>825.6 - 935.3</td>
</tr>
<tr>
<td><strong>Scholastic Level Exam</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 2013</td>
<td>25</td>
<td>8.806</td>
<td>0.965</td>
<td>6.9 - 10.7</td>
</tr>
<tr>
<td>April 2014</td>
<td>25</td>
<td>11.236</td>
<td>0.961</td>
<td>9.4 - 13.1</td>
</tr>
<tr>
<td><strong>Typing Speed</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 2013</td>
<td>25</td>
<td>15.832</td>
<td>1.035</td>
<td>13.8 - 17.9</td>
</tr>
<tr>
<td>April 2014</td>
<td>25</td>
<td>23.254</td>
<td>1.310</td>
<td>20.7 - 25.8</td>
</tr>
</tbody>
</table>
Table 4B. Adjusted Means, Standard Deviations, and Ranges for Urban Comparison Students

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Mean</th>
<th>S. D.</th>
<th>Range (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dependent Variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>CLA+ Performance Task</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 2013</td>
<td>38</td>
<td>718.906</td>
<td>24.395</td>
<td>671.1 - 766.7</td>
</tr>
<tr>
<td>April 2014</td>
<td>38</td>
<td>740.042</td>
<td>31.449</td>
<td>678.4 - 801.7</td>
</tr>
<tr>
<td><strong>CLA+ Selected Response Questions</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 2013</td>
<td>38</td>
<td>717.260</td>
<td>27.984</td>
<td>662.4 - 772.1</td>
</tr>
<tr>
<td>April 2014</td>
<td>38</td>
<td>770.933</td>
<td>26.285</td>
<td>719.4 - 822.5</td>
</tr>
<tr>
<td><strong>Scholastic Level Exam</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 2013</td>
<td>38</td>
<td>9.364</td>
<td>0.734</td>
<td>7.9 - 10.8</td>
</tr>
<tr>
<td>April 2014</td>
<td>38</td>
<td>12.397</td>
<td>0.773</td>
<td>10.9 - 13.9</td>
</tr>
<tr>
<td><strong>Typing Speed</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 2013</td>
<td>38</td>
<td>8.885</td>
<td>0.864</td>
<td>7.2 - 10.6</td>
</tr>
<tr>
<td>April 2014</td>
<td>38</td>
<td>12.545</td>
<td>0.776</td>
<td>11.0 - 14.1</td>
</tr>
</tbody>
</table>
Table 4C. Comparison of Means on Urban Respondents in Treatment by Independent Variable

<table>
<thead>
<tr>
<th>Independent Variables by Test Date</th>
<th>Respondent in Treatment</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(test value)</td>
<td>(test value)</td>
<td></td>
</tr>
<tr>
<td><strong>CLA+ Performance Task</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 2013</td>
<td>718.91*</td>
<td>811.14</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(38)</td>
<td>(25)</td>
<td></td>
</tr>
<tr>
<td>April 2014</td>
<td>740.04</td>
<td>772.94</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(38)</td>
<td>(25)</td>
<td></td>
</tr>
<tr>
<td><strong>CLA+ Selected Response Questions</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 2013</td>
<td>717.26</td>
<td>794.72</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(38)</td>
<td>(25)</td>
<td></td>
</tr>
<tr>
<td>April 2014</td>
<td>770.93*</td>
<td>880.46</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(38)</td>
<td>(25)</td>
<td></td>
</tr>
<tr>
<td><strong>Scholastic Level Exam</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 2013</td>
<td>9.36</td>
<td>8.81</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(38)</td>
<td>(25)</td>
<td></td>
</tr>
<tr>
<td>April 2014</td>
<td>12.40</td>
<td>11.24</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(38)</td>
<td>(25)</td>
<td></td>
</tr>
<tr>
<td><strong>Typing Speed</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 2013</td>
<td>8.89***</td>
<td>15.83</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(38)</td>
<td>(25)</td>
<td></td>
</tr>
<tr>
<td>April 2014</td>
<td>12.55</td>
<td>23.25</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(38)</td>
<td>(25)</td>
<td></td>
</tr>
</tbody>
</table>

* p = .05, ** p = .01, *** p = .001
Table 5A displays the adjusted means, standard deviations, and ranges for Kepler rural students, and Table 5B shows the same data for comparison urban students. The comparison of means on Kepler urban respondents by independent variable is displayed in Table 5C.

In the October 2013 administration of the CLA+ performance tasks, the comparison rural students scored 672.11 and Kepler females scored 693.33. There was no statistically significant difference in their scores. This held true for the April 2014 administration of the test, when the comparison urban test takers scored 737.06 and Kepler female urban students scored 712.63.

Kepler rural students, however, outperformed the comparison group of rural students at a statistically significant level in both the October 2013 and April 2014 administration of the CLA+ selected questions examination. In 2013, the comparison group scored 685.29, and Kepler students scored 799.41. In 2014, the comparison group of rural students scored 749.70, and Kepler rural students scored 888.34. In both 2013 and 2104, the Kepler students outperformed the comparison group at a statistically significant level of .01.

On the SLE test, the comparison group of rural student scored 7.27, and Kepler students scored 11.29. Kepler rural students outperformed the comparison group at a statistically significant level with a p-value of .001. The same did not hold true in April 2014, however, when the comparison group scored 10.60 and Kepler rural students scored 10.66.

Finally, Kepler rural students outperformed the comparison group on both the 2013 and 2014 administrations of the test at a statistically significant level. a p-value of .001, on the typing speed test. In October 2013, the comparison rural students scored 7.40, and Kepler rural test takers scored 14.83. In August 2014, comparison students scored 10.08, and Kepler rural students scored 21.55.
Table 5A. Adjusted Means, Standard Deviations, and Ranges for Rural Treatment Students

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Mean</th>
<th>S. D.</th>
<th>Range (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CLA+ Performance Task</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 2013</td>
<td>23</td>
<td>696.328</td>
<td>37.809</td>
<td>622.2 - 770.4</td>
</tr>
<tr>
<td>April 2014</td>
<td>23</td>
<td>712.633</td>
<td>48.068</td>
<td>618.4 - 806.8</td>
</tr>
<tr>
<td><strong>CLA+ Selected Response Questions</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 2013</td>
<td>23</td>
<td>799.409</td>
<td>32.587</td>
<td>735.5 - 863.3</td>
</tr>
<tr>
<td>April 2014</td>
<td>23</td>
<td>888.338</td>
<td>34.523</td>
<td>820.7 - 956.0</td>
</tr>
<tr>
<td><strong>Scholastic Level Exam</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 2013</td>
<td>23</td>
<td>11.289</td>
<td>0.823</td>
<td>9.7 - 12.9</td>
</tr>
<tr>
<td>April 2014</td>
<td>23</td>
<td>10.663</td>
<td>1.389</td>
<td>7.9 - 13.4</td>
</tr>
<tr>
<td><strong>Typing Speed</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 2013</td>
<td>23</td>
<td>14.830</td>
<td>0.988</td>
<td>12.9 - 16.8</td>
</tr>
<tr>
<td>April 2014</td>
<td>23</td>
<td>21.550</td>
<td>1.538</td>
<td>18.5 - 24.6</td>
</tr>
</tbody>
</table>
Table 5B. Adjusted Means, Standard Deviations, and Ranges for Rural Comparison Students

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Mean</th>
<th>S. D.</th>
<th>Range (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dependent Variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CLA+ Performance Task</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 2013</td>
<td>60</td>
<td>672.108</td>
<td>18.641</td>
<td>635.6 - 708.6</td>
</tr>
<tr>
<td>April 2014</td>
<td>60</td>
<td>737.058</td>
<td>22.769</td>
<td>692.4 - 781.7</td>
</tr>
<tr>
<td>CLA+ Selected Response Questions</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 2013</td>
<td>60</td>
<td>685.293</td>
<td>19.839</td>
<td>646.4 - 724.2</td>
</tr>
<tr>
<td>April 2014</td>
<td>60</td>
<td>749.704</td>
<td>17.085</td>
<td>716.2 - 783.2</td>
</tr>
<tr>
<td>Scholastic Level Exam</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 2013</td>
<td>60</td>
<td>7.273</td>
<td>0.555</td>
<td>6.2 - 8.4</td>
</tr>
<tr>
<td>April 2014</td>
<td>60</td>
<td>10.596</td>
<td>0.504</td>
<td>9.6 - 11.6</td>
</tr>
<tr>
<td>Typing Speed</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 2013</td>
<td>60</td>
<td>7.399</td>
<td>0.642</td>
<td>6.1 - 8.7</td>
</tr>
<tr>
<td>April 2014</td>
<td>60</td>
<td>10.078</td>
<td>0.506</td>
<td>9.1 - 11.1</td>
</tr>
</tbody>
</table>
Table 5C. Comparison of Means on Rural Respondents in Treatment by Independent Variable

<table>
<thead>
<tr>
<th>Independent Variables by Test Date</th>
<th>Respondent In Treatment</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>(n)</td>
<td>(n)</td>
</tr>
<tr>
<td>CLA+ Performance Task</td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 2013</td>
<td>672.11 (60)</td>
<td>696.33 (23)</td>
</tr>
<tr>
<td>April 2014</td>
<td>737.06 (60)</td>
<td>712.63 (23)</td>
</tr>
<tr>
<td>CLA+ Selected Response Questions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 2013</td>
<td>685.29** (60)</td>
<td>799.41 (23)</td>
</tr>
<tr>
<td>April 2014</td>
<td>749.70** (60)</td>
<td>888.34 (23)</td>
</tr>
<tr>
<td>Scholastic Level Exam</td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 2013</td>
<td>7.27*** (60)</td>
<td>11.29 (23)</td>
</tr>
<tr>
<td>April 2014</td>
<td>10.60 (60)</td>
<td>10.66 (23)</td>
</tr>
<tr>
<td>Typing Speed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 2013</td>
<td>7.40*** (60)</td>
<td>14.83 (23)</td>
</tr>
<tr>
<td>April 2014</td>
<td>10.08*** (60)</td>
<td>21.55 (23)</td>
</tr>
</tbody>
</table>

* p = .05, ** p = .01, *** p = .001

Poverty

Table 6A outlines the means and standard deviation of scores by poverty subgroup, and Table 6B outlines the comparison of scores by poverty subgroup. In these tables, the poverty subgroups are defined by group 1 being the poorest, group 2 being extremely poor, and group 3 being very poor. The ubudehe score is used by the Rwandan government to indicate the poverty status of a household. Scores range from 1 to 6, and it is a factor in government scholarship awards.
A higher ubudehe score indicates that the household is of a wealthier status in the community. Directly from the Rwandan government at community meetings, translated from Kinyarwanda are the descriptions: 1) Level 1- Those in abject poverty locally referred to as ‘abatindi nyakuja’, own no property, live on begging and help from others, and consider it lucky if they died; 2) Level 2 - The very poor and these have no house, live on poor diet which they can afford with difficulty, work every day for others for their survival, have tattered clothes, own no portion of land, and do not own cattle; 3) Level 3- Called the poor. These depend on food deficit in nutrients, own a small portion of land, have low production and their children cannot afford secondary education; 4) Level 4-The resourceful poor who own some land, cattle, a bicycle, have average production, their children can afford secondary education, and have less difficulties in accessing health care; 5) Level 5-The food rich people who basically own big lands, eat balanced food diets and live decent houses. They employ others, own cattle, and their children easily afford university education; and 6) Level 6-The money rich, who comprise of people with money in banks, receive bank loans, own a beautiful house, a car, cattle, fertile lands, sufficient food and are permanent employers. In the tables below, only levels 1-3 are noted, as Kepler only accepted students from the poorest 3 levels during its first year. Levels 1-3 are most vulnerable, and generally those in level 4 are not able to attend university because of financial concerns and certainly live in (what we would consider in US) to be abject poverty. This system was used at the time of data collection. Because of fraud and community identification, the system is now revamped into a new method of identification and is now on a scale of 1-4. The system has been controversial in Rwanda.

There were only three statistically significant differences in performance when comparing poverty subgroups: 1) group 3 versus group 1 on the April 2014 CLA+ Performance Task with a p-value of .025; 2) group 3 versus group 2 on the April 2014 CLA+ Performance Task with a p-
value of .012, and 3) group 3 versus group 2 on the 2014 CLA+ Selected Response Questions with a p-value of .014. There were no instances of statistically significant findings in the comparison of scores by poverty subgroup on 2013 CLA+ Performance Task, the October 2013 CLA+ Selected Response Questions, both administrations of the Scholastic Level Exams, nor both administrations of the Typing Speed Tests. In all, the limited numbers of statistically significant findings in the comparison of scores by poverty subgroups indicate poverty status is not a major contributor to performance at Kepler.
### Table 6A. Means, Standard Deviations of Scores by Poverty Subgroup

<table>
<thead>
<tr>
<th>Variable</th>
<th>Subgroup</th>
<th>N</th>
<th>Mean</th>
<th>S. D.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Independent Variable</td>
<td>Ubudehe Group</td>
<td>Dependent Variables</td>
<td></td>
</tr>
<tr>
<td><strong>CLA+ Performance Task</strong></td>
<td>1-poorest</td>
<td>61</td>
<td>717.377</td>
<td>173.878</td>
</tr>
<tr>
<td>October 2013</td>
<td>2-extremely poor</td>
<td>66</td>
<td>710.485</td>
<td>167.887</td>
</tr>
<tr>
<td></td>
<td>3-very poor</td>
<td>19</td>
<td>699.316</td>
<td>125.657</td>
</tr>
<tr>
<td>April 2014</td>
<td>1-poorest</td>
<td>61</td>
<td>751.34426</td>
<td>179.31006</td>
</tr>
<tr>
<td></td>
<td>2-extremely poor</td>
<td>66</td>
<td>762.87879</td>
<td>186.27114</td>
</tr>
<tr>
<td></td>
<td>3-very poor</td>
<td>19</td>
<td>625.10526</td>
<td>180.3524</td>
</tr>
<tr>
<td><strong>CLA+ Selected Response Questions</strong></td>
<td>1-poorest</td>
<td>61</td>
<td>729.623</td>
<td>157.484</td>
</tr>
<tr>
<td>October 2013</td>
<td>2-extremely poor</td>
<td>66</td>
<td>747.909</td>
<td>161.730</td>
</tr>
<tr>
<td></td>
<td>3-very poor</td>
<td>19</td>
<td>671.526</td>
<td>122.217</td>
</tr>
<tr>
<td>April 2014</td>
<td>1-poorest</td>
<td>61</td>
<td>797.410</td>
<td>142.684</td>
</tr>
<tr>
<td></td>
<td>2-extremely poor</td>
<td>66</td>
<td>822.364</td>
<td>119.249</td>
</tr>
<tr>
<td></td>
<td>3-very poor</td>
<td>19</td>
<td>726.474</td>
<td>116.544</td>
</tr>
<tr>
<td><strong>Scholastic Level Exam</strong></td>
<td>1-poorest</td>
<td>61</td>
<td>8.7705</td>
<td>4.6310</td>
</tr>
<tr>
<td>October 2013</td>
<td>2-extremely poor</td>
<td>66</td>
<td>8.9091</td>
<td>4.6797</td>
</tr>
<tr>
<td></td>
<td>3-very poor</td>
<td>19</td>
<td>7.8421</td>
<td>5.6299</td>
</tr>
<tr>
<td>April 2014</td>
<td>1-poorest</td>
<td>61</td>
<td>10.803</td>
<td>4.553</td>
</tr>
<tr>
<td></td>
<td>2-extremely poor</td>
<td>66</td>
<td>11.500</td>
<td>5.364</td>
</tr>
<tr>
<td></td>
<td>3-very poor</td>
<td>19</td>
<td>11.316</td>
<td>4.097</td>
</tr>
<tr>
<td><strong>Typing Speed</strong></td>
<td>1-poorest</td>
<td>61</td>
<td>11.030</td>
<td>6.951</td>
</tr>
<tr>
<td>October 2013</td>
<td>2-extremely poor</td>
<td>66</td>
<td>10.610</td>
<td>6.714</td>
</tr>
<tr>
<td></td>
<td>3-very poor</td>
<td>19</td>
<td>7.651</td>
<td>5.138</td>
</tr>
<tr>
<td>April 2014</td>
<td>1-poorest</td>
<td>61</td>
<td>14.322</td>
<td>6.997</td>
</tr>
<tr>
<td></td>
<td>2-extremely poor</td>
<td>66</td>
<td>15.973</td>
<td>8.576</td>
</tr>
<tr>
<td></td>
<td>3-very poor</td>
<td>19</td>
<td>12.135</td>
<td>6.828</td>
</tr>
<tr>
<td>Variable</td>
<td>Subgroup</td>
<td>Contrast</td>
<td>Std. Err.</td>
<td>t</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>---------------------------------</td>
<td>---------------------------</td>
<td>-----------</td>
<td>-------</td>
</tr>
<tr>
<td><strong>CLA+ Performance Task</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 2013</td>
<td>2-extremely poor vs 1-poorest</td>
<td>-6.892</td>
<td>29.445</td>
<td>-0.230</td>
</tr>
<tr>
<td></td>
<td>3-very poor vs 1-poorest</td>
<td>-18.061</td>
<td>43.556</td>
<td>-0.410</td>
</tr>
<tr>
<td></td>
<td>3-very poor vs 2-extremely poor</td>
<td>-11.169</td>
<td>43.163</td>
<td>-0.260</td>
</tr>
<tr>
<td>April 2014</td>
<td>2-extremely poor vs 1-poorest</td>
<td>11.535</td>
<td>32.438</td>
<td>0.360</td>
</tr>
<tr>
<td></td>
<td>3-very poor vs 1-poorest</td>
<td>-126.239</td>
<td>47.983</td>
<td>-2.630</td>
</tr>
<tr>
<td></td>
<td>3-very poor vs 2-extremely poor</td>
<td>-137.774</td>
<td>47.550</td>
<td>-2.900</td>
</tr>
<tr>
<td><strong>CLA+ Selected Response Questions</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 2013</td>
<td>2-extremely poor vs 1-poorest</td>
<td>18.286</td>
<td>27.616</td>
<td>0.660</td>
</tr>
<tr>
<td></td>
<td>3-very poor vs 1-poorest</td>
<td>-58.097</td>
<td>40.850</td>
<td>-1.420</td>
</tr>
<tr>
<td></td>
<td>3-very poor vs 2-extremely poor</td>
<td>-76.383</td>
<td>40.481</td>
<td>-1.890</td>
</tr>
<tr>
<td>April 2014</td>
<td>2-extremely poor vs 1-poorest</td>
<td>24.954</td>
<td>22.963</td>
<td>1.090</td>
</tr>
<tr>
<td></td>
<td>3-very poor vs 1-poorest</td>
<td>-70.936</td>
<td>33.968</td>
<td>-2.090</td>
</tr>
<tr>
<td></td>
<td>3-very poor vs 2-extremely poor</td>
<td>-95.890</td>
<td>33.661</td>
<td>-2.850</td>
</tr>
</tbody>
</table>
### Scholastic Level Exam

<table>
<thead>
<tr>
<th></th>
<th>2-extremely poor vs 1-poorest</th>
<th>3-very poor vs 1-poorest</th>
<th>3-very poor vs 2-extremely poor</th>
</tr>
</thead>
<tbody>
<tr>
<td>October 2013</td>
<td>0.139 0.851 0.160 0.985 -1.876 2.153</td>
<td>-0.928 1.258 -0.740 0.741 -3.909 2.052</td>
<td>-1.067 1.247 -0.860 0.669 -4.020 1.886</td>
</tr>
<tr>
<td>April 2014</td>
<td>0.697 0.868 0.800 0.702 -1.359 2.753</td>
<td>0.513 1.284 0.400 0.916 -2.529 3.554</td>
<td>-0.184 1.273 -0.140 0.989 -3.198 2.830</td>
</tr>
</tbody>
</table>

### Typing Speed

<table>
<thead>
<tr>
<th></th>
<th>2-extremely poor vs 1-poorest</th>
<th>3-very poor vs 1-poorest</th>
<th>3-very poor vs 2-extremely poor</th>
</tr>
</thead>
<tbody>
<tr>
<td>October 2013</td>
<td>-0.420 1.179 -0.360 0.933 -3.213 2.373</td>
<td>-3.380 1.744 -1.940 0.132 -7.511 0.752</td>
<td>-2.960 1.729 -1.710 0.204 -7.054 1.134</td>
</tr>
<tr>
<td>April 2014</td>
<td>1.651 1.374 1.200 0.454 -1.603 4.905</td>
<td>-2.187 2.032 -1.080 0.530 -7.000 2.626</td>
<td>-3.838 2.014 -1.910 0.141 -8.608 0.932</td>
</tr>
</tbody>
</table>
Age

Table 7B outlines the comparison of scores by age subgroup. Within these tables, the age groups are broken into 1, 2, 3, and 4 which were divided into quartiles of ages for Kepler students. In this table, in years, Age 1 is 18.5 to 20.5, Age 2 is 20.6 to 21.3, Age 3 is 21.4 to 23, and Age 4 is 23.1 to 26.3. There was only one statistically significant difference found, which was on the April 2014 administration of the Scholastic Level Exam for Age 4 versus Age 1. These findings indicate that age has little to no impact on performance at Kepler.
# Table 7A. Means, Standard Deviations of Scores by Age Subgroup

<table>
<thead>
<tr>
<th>Variable</th>
<th>Subgroup</th>
<th>N</th>
<th>Mean</th>
<th>S. D.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CLA+ Performance Task</strong></td>
<td><strong>Independent Variable</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 2013</td>
<td>1-18.5 to 20.5</td>
<td>37</td>
<td>717.000</td>
<td>136.695</td>
</tr>
<tr>
<td></td>
<td>2-20.6 to 21.3</td>
<td>36</td>
<td>742.056</td>
<td>178.200</td>
</tr>
<tr>
<td></td>
<td>3-21.4 to 23</td>
<td>36</td>
<td>704.667</td>
<td>177.572</td>
</tr>
<tr>
<td></td>
<td>4-23.1 to 26.3</td>
<td>37</td>
<td>684.541</td>
<td>165.352</td>
</tr>
<tr>
<td>April 2014</td>
<td>1-18.5 to 20.5</td>
<td>37</td>
<td>769.892</td>
<td>207.319</td>
</tr>
<tr>
<td></td>
<td>2-20.6 to 21.3</td>
<td>36</td>
<td>751.639</td>
<td>169.691</td>
</tr>
<tr>
<td></td>
<td>3-21.4 to 23</td>
<td>36</td>
<td>741.250</td>
<td>168.378</td>
</tr>
<tr>
<td></td>
<td>4-23.1 to 26.3</td>
<td>37</td>
<td>698.081</td>
<td>198.094</td>
</tr>
<tr>
<td><strong>CLA+ Selected Response Questions</strong></td>
<td><strong>Dependent Variables</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 2013</td>
<td>1-18.5 to 20.5</td>
<td>37</td>
<td>737.514</td>
<td>171.345</td>
</tr>
<tr>
<td></td>
<td>2-20.6 to 21.3</td>
<td>36</td>
<td>713.944</td>
<td>158.606</td>
</tr>
<tr>
<td></td>
<td>3-21.4 to 23</td>
<td>36</td>
<td>764.889</td>
<td>134.598</td>
</tr>
<tr>
<td></td>
<td>4-23.1 to 26.3</td>
<td>37</td>
<td>705.459</td>
<td>157.614</td>
</tr>
<tr>
<td>April 2014</td>
<td>1-18.5 to 20.5</td>
<td>37</td>
<td>796.838</td>
<td>128.138</td>
</tr>
<tr>
<td></td>
<td>2-20.6 to 21.3</td>
<td>36</td>
<td>831.056</td>
<td>135.929</td>
</tr>
<tr>
<td></td>
<td>3-21.4 to 23</td>
<td>36</td>
<td>801.472</td>
<td>121.052</td>
</tr>
<tr>
<td></td>
<td>4-23.1 to 26.3</td>
<td>37</td>
<td>769.378</td>
<td>140.035</td>
</tr>
<tr>
<td><strong>Scholastic Level Exam</strong></td>
<td><strong>Independent Variable</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 2013</td>
<td>1-18.5 to 20.5</td>
<td>37</td>
<td>10.297</td>
<td>4.881</td>
</tr>
<tr>
<td></td>
<td>2-20.6 to 21.3</td>
<td>36</td>
<td>8.472</td>
<td>5.358</td>
</tr>
<tr>
<td></td>
<td>3-21.4 to 23</td>
<td>36</td>
<td>8.444</td>
<td>4.259</td>
</tr>
<tr>
<td></td>
<td>4-23.1 to 26.3</td>
<td>37</td>
<td>7.622</td>
<td>4.278</td>
</tr>
<tr>
<td>April 2014</td>
<td>1-18.5 to 20.5</td>
<td>37</td>
<td>12.838</td>
<td>5.058</td>
</tr>
<tr>
<td></td>
<td>2-20.6 to 21.3</td>
<td>36</td>
<td>11.583</td>
<td>5.358</td>
</tr>
<tr>
<td></td>
<td>3-21.4 to 23</td>
<td>36</td>
<td>10.417</td>
<td>4.417</td>
</tr>
<tr>
<td></td>
<td>4-23.1 to 26.3</td>
<td>37</td>
<td>9.892</td>
<td>4.195</td>
</tr>
<tr>
<td><strong>Typing Speed</strong></td>
<td><strong>Independent Variable</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 2013</td>
<td>1-18.5 to 20.5</td>
<td>37</td>
<td>12.236</td>
<td>7.049</td>
</tr>
<tr>
<td></td>
<td>2-20.6 to 21.3</td>
<td>36</td>
<td>11.406</td>
<td>7.218</td>
</tr>
<tr>
<td></td>
<td>3-21.4 to 23</td>
<td>36</td>
<td>9.020</td>
<td>4.720</td>
</tr>
<tr>
<td></td>
<td>4-23.1 to 26.3</td>
<td>37</td>
<td>8.931</td>
<td>7.018</td>
</tr>
<tr>
<td>April 2014</td>
<td>1-18.5 to 20.5</td>
<td>37</td>
<td>16.324</td>
<td>7.464</td>
</tr>
<tr>
<td></td>
<td>2-20.6 to 21.3</td>
<td>36</td>
<td>16.422</td>
<td>8.622</td>
</tr>
<tr>
<td></td>
<td>3-21.4 to 23</td>
<td>36</td>
<td>13.172</td>
<td>5.697</td>
</tr>
<tr>
<td></td>
<td>4-23.1 to 26.3</td>
<td>37</td>
<td>13.216</td>
<td>8.634</td>
</tr>
</tbody>
</table>
Table 7B. Comparison of Scores by Age Subgroup

<table>
<thead>
<tr>
<th>Variable</th>
<th>Subgroup</th>
<th>Contrast</th>
<th>Std. Err.</th>
<th>t</th>
<th>p &gt;</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CLA+ Performance Task</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 2013</td>
<td>2 vs 1</td>
<td>25.056</td>
<td>38.657</td>
<td>0.650</td>
<td>0.916</td>
<td>-75.44  125.55</td>
</tr>
<tr>
<td></td>
<td>3 vs 1</td>
<td>-12.333</td>
<td>38.657</td>
<td>0.320</td>
<td>0.989</td>
<td>-112.83 88.17</td>
</tr>
<tr>
<td></td>
<td>4 vs 1</td>
<td>-32.459</td>
<td>38.392</td>
<td>0.850</td>
<td>0.833</td>
<td>-132.27 67.35</td>
</tr>
<tr>
<td></td>
<td>3 vs 2</td>
<td>-37.389</td>
<td>38.921</td>
<td>0.960</td>
<td>0.772</td>
<td>-138.57 63.80</td>
</tr>
<tr>
<td></td>
<td>4 vs 2</td>
<td>-57.515</td>
<td>38.657</td>
<td>1.490</td>
<td>0.448</td>
<td>-112.83 42.98</td>
</tr>
<tr>
<td></td>
<td>4 vs 3</td>
<td>-20.126</td>
<td>38.657</td>
<td>0.520</td>
<td>0.954</td>
<td>-120.62 80.37</td>
</tr>
<tr>
<td>April 2014</td>
<td>2 vs 1</td>
<td>-18.253</td>
<td>43.753</td>
<td>0.420</td>
<td>0.975</td>
<td>-132.00 95.49</td>
</tr>
<tr>
<td></td>
<td>3 vs 1</td>
<td>-28.642</td>
<td>43.753</td>
<td>0.650</td>
<td>0.914</td>
<td>-142.39 85.10</td>
</tr>
<tr>
<td></td>
<td>4 vs 1</td>
<td>-71.811</td>
<td>43.453</td>
<td>1.650</td>
<td>0.353</td>
<td>-184.78 41.15</td>
</tr>
<tr>
<td></td>
<td>3 vs 2</td>
<td>-10.389</td>
<td>44.052</td>
<td>0.240</td>
<td>0.995</td>
<td>-124.91 104.13</td>
</tr>
<tr>
<td></td>
<td>4 vs 2</td>
<td>-53.558</td>
<td>43.753</td>
<td>1.220</td>
<td>0.613</td>
<td>-167.30 60.19</td>
</tr>
<tr>
<td></td>
<td>4 vs 3</td>
<td>-43.169</td>
<td>43.753</td>
<td>0.990</td>
<td>0.757</td>
<td>-156.92 70.58</td>
</tr>
<tr>
<td><strong>CLA+ Selected Response Questions</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 2013</td>
<td>2 vs 1</td>
<td>-23.569</td>
<td>36.573</td>
<td>0.640</td>
<td>0.917</td>
<td>-118.65 71.51</td>
</tr>
<tr>
<td></td>
<td>3 vs 1</td>
<td>27.375</td>
<td>36.573</td>
<td>0.750</td>
<td>0.877</td>
<td>-67.71 122.46</td>
</tr>
<tr>
<td></td>
<td>4 vs 1</td>
<td>-32.054</td>
<td>36.322</td>
<td>0.880</td>
<td>0.814</td>
<td>-126.48 62.37</td>
</tr>
<tr>
<td></td>
<td>3 vs 2</td>
<td>50.944</td>
<td>36.823</td>
<td>1.380</td>
<td>0.512</td>
<td>-44.79 146.67</td>
</tr>
<tr>
<td></td>
<td>4 vs 2</td>
<td>-8.485</td>
<td>36.573</td>
<td>0.230</td>
<td>0.996</td>
<td>-103.57 86.60</td>
</tr>
<tr>
<td></td>
<td>4 vs 3</td>
<td>-59.429</td>
<td>36.573</td>
<td>1.620</td>
<td>0.368</td>
<td>-154.51 35.65</td>
</tr>
<tr>
<td>April 2014</td>
<td>2 vs 1</td>
<td>34.218</td>
<td>30.792</td>
<td>1.110</td>
<td>0.683</td>
<td>-45.83 114.27</td>
</tr>
<tr>
<td></td>
<td>3 vs 1</td>
<td>4.634</td>
<td>30.792</td>
<td>0.150</td>
<td>0.999</td>
<td>-75.42 84.68</td>
</tr>
<tr>
<td></td>
<td>4 vs 1</td>
<td>-27.459</td>
<td>30.580</td>
<td>0.900</td>
<td>0.806</td>
<td>-106.96 52.04</td>
</tr>
<tr>
<td></td>
<td>3 vs 2</td>
<td>-29.583</td>
<td>31.002</td>
<td>0.950</td>
<td>0.776</td>
<td>-110.18 51.01</td>
</tr>
<tr>
<td></td>
<td>4 vs 2</td>
<td>-61.677</td>
<td>30.792</td>
<td>2.000</td>
<td>0.192</td>
<td>-141.73 18.37</td>
</tr>
<tr>
<td></td>
<td>4 vs 3</td>
<td>-32.094</td>
<td>30.792</td>
<td>1.040</td>
<td>0.725</td>
<td>-112.14 47.96</td>
</tr>
</tbody>
</table>
### Scholastic Level Exam

<table>
<thead>
<tr>
<th></th>
<th>2 vs 1</th>
<th>3 vs 1</th>
<th>4 vs 1</th>
<th>3 vs 2</th>
<th>4 vs 2</th>
<th>4 vs 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>October 2013</strong></td>
<td>-1.825</td>
<td>-1.853</td>
<td>-2.676</td>
<td>-0.028</td>
<td>-0.851</td>
<td>-0.823</td>
</tr>
<tr>
<td></td>
<td>1.104</td>
<td>1.104</td>
<td>1.096</td>
<td>1.111</td>
<td>1.104</td>
<td>1.104</td>
</tr>
<tr>
<td></td>
<td>1.650</td>
<td>1.680</td>
<td>2.440</td>
<td>0.020</td>
<td>0.770</td>
<td>0.750</td>
</tr>
<tr>
<td></td>
<td>0.352</td>
<td>0.339</td>
<td>0.074</td>
<td>1.000</td>
<td>0.868</td>
<td>0.878</td>
</tr>
<tr>
<td></td>
<td>-4.69</td>
<td>-4.72</td>
<td>-5.53</td>
<td>-2.92</td>
<td>-3.72</td>
<td>-3.69</td>
</tr>
<tr>
<td></td>
<td>1.04</td>
<td>1.02</td>
<td>0.17</td>
<td>2.86</td>
<td>2.02</td>
<td>2.05</td>
</tr>
</tbody>
</table>

### April 2014

<table>
<thead>
<tr>
<th></th>
<th>2 vs 1</th>
<th>3 vs 1</th>
<th>4 vs 1</th>
<th>3 vs 2</th>
<th>4 vs 2</th>
<th>4 vs 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-1.255</td>
<td>-2.421</td>
<td>-2.946</td>
<td>-1.167</td>
<td>-1.691</td>
<td>-0.525</td>
</tr>
<tr>
<td></td>
<td>1.119</td>
<td>1.119</td>
<td>1.111</td>
<td>1.126</td>
<td>1.119</td>
<td>1.119</td>
</tr>
<tr>
<td></td>
<td>1.120</td>
<td>2.160</td>
<td>2.650</td>
<td>1.040</td>
<td>1.510</td>
<td>0.470</td>
</tr>
<tr>
<td></td>
<td>0.677</td>
<td>0.138</td>
<td>0.044</td>
<td>0.729</td>
<td>0.433</td>
<td>0.966</td>
</tr>
<tr>
<td></td>
<td>-4.16</td>
<td>-5.33</td>
<td>-5.83</td>
<td>-4.09</td>
<td>-4.60</td>
<td>-3.43</td>
</tr>
<tr>
<td></td>
<td>1.65</td>
<td>0.49</td>
<td>-0.06</td>
<td>1.76</td>
<td>1.22</td>
<td>2.38</td>
</tr>
</tbody>
</table>

### Typing Speed

<table>
<thead>
<tr>
<th></th>
<th>2 vs 1</th>
<th>3 vs 1</th>
<th>4 vs 1</th>
<th>3 vs 2</th>
<th>4 vs 2</th>
<th>4 vs 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>October 2013</strong></td>
<td>-0.830</td>
<td>-3.216</td>
<td>-3.305</td>
<td>-2.386</td>
<td>-2.475</td>
<td>-0.089</td>
</tr>
<tr>
<td></td>
<td>1.542</td>
<td>1.542</td>
<td>1.532</td>
<td>1.553</td>
<td>1.542</td>
<td>1.542</td>
</tr>
<tr>
<td></td>
<td>0.540</td>
<td>2.080</td>
<td>2.160</td>
<td>1.540</td>
<td>1.600</td>
<td>0.060</td>
</tr>
<tr>
<td></td>
<td>0.950</td>
<td>0.163</td>
<td>0.140</td>
<td>0.419</td>
<td>0.379</td>
<td>1.000</td>
</tr>
<tr>
<td></td>
<td>-4.84</td>
<td>-7.23</td>
<td>-7.29</td>
<td>-6.42</td>
<td>-6.48</td>
<td>-4.10</td>
</tr>
<tr>
<td></td>
<td>3.18</td>
<td>0.79</td>
<td>0.68</td>
<td>1.65</td>
<td>1.54</td>
<td>3.92</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>2 vs 1</th>
<th>3 vs 1</th>
<th>4 vs 1</th>
<th>3 vs 2</th>
<th>4 vs 2</th>
<th>4 vs 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>April 2014</strong></td>
<td>0.098</td>
<td>-3.152</td>
<td>-3.108</td>
<td>-3.250</td>
<td>-3.206</td>
<td>0.044</td>
</tr>
<tr>
<td></td>
<td>1.803</td>
<td>1.803</td>
<td>1.791</td>
<td>1.816</td>
<td>1.803</td>
<td>1.803</td>
</tr>
<tr>
<td></td>
<td>0.050</td>
<td>1.750</td>
<td>1.740</td>
<td>1.790</td>
<td>1.780</td>
<td>0.020</td>
</tr>
<tr>
<td></td>
<td>1.000</td>
<td>0.303</td>
<td>0.309</td>
<td>0.282</td>
<td>0.288</td>
<td>1.000</td>
</tr>
<tr>
<td></td>
<td>-4.59</td>
<td>-7.84</td>
<td>-7.76</td>
<td>-7.97</td>
<td>-7.89</td>
<td>-4.64</td>
</tr>
<tr>
<td></td>
<td>4.79</td>
<td>1.54</td>
<td>1.55</td>
<td>1.47</td>
<td>1.48</td>
<td>4.73</td>
</tr>
</tbody>
</table>
Chapter 4b: IDinsight qualitative data

Students in the first Kepler cohort answered a series of questions about their experiences with Kepler, including what makes Kepler different from other local universities, how they heard about Kepler, and what Kepler needs to improve. The findings discussed below came from interviews in September 2014.

Perception of Kepler compared to other local universities

Females

In the responses collected, all female students reported Kepler is different from other local universities. Students overwhelmingly noted Kepler provided individual support to ensure students know where and how they are progressing, as well as specific areas of improvement. Kepler students favorably compared their institution to other universities, where local programs of study consisted of large lectures with professors who may be unavailable. At Kepler, students describe a smaller, more intimate learning environment with smaller classes and feedback given in-person and through technology, as well as office hours and small group feedback. Students and instructors know well student’s individual performance. For example, Claudine, a twenty-four-year-old student who experienced several years of interrupted education due to the violence of the 1994 Genocide noted, “Kepler is different from other universities because it has the system of controlling every student to know his/her performance. In addition to this, they have a good system that may help a student to live in every country he/she may be able to live in.” Kevine, a student from the Rwandan countryside who is supporting her widowed mother and six brothers and sisters echoed the sentiment that Kepler provided a higher level of support than other institutions, adding, “They differ from other universities because they help every student succeed while other universities don't consider the individual student needs and personalities.”
Respondents also noted Kepler has a different approach for the university-to-employment pipeline. Generally, most students are not engaging in an internship in Rwanda until post-graduation. Kepler has purposefully disrupted this model, placing students in a work-study role on the Kepler campus in the first year, followed by internships that are intended to lead to full-time employment before graduation. The curriculum supports the school to employment pipeline by taking feedback from employers and using technology to build programs of study. Kepler demands a high level of English, which many employers have noted is not present in the market place. Sarah, a student who made it through secondary school because of an international sponsor that noticed her promise during a visit to the Rwandan countryside after the 1994 genocide, noted, “Kepler provides a high level of support in each and every class, even though they expect so much of us in terms of technology, English, and work.” Similar aspects of the program were noted by Marie, a student who slept with four siblings in one room, lacked electricity and running water, commented that “the degree we will get, the fact that we study through MOOCs, in small groups, office hours support and fact that we have the Internet everywhere are some of the things that make Kepler different from other universities. Additionally, the internship that we get from the first year makes us really different compared to other universities where students might never get an internship, or at least not until they graduate.”

Finally, students highlighted the non-academic assistance they receive at Kepler. They credit it with reducing life stress and bolstering their ability to achieve academically. Specifically, students note the school’s provision of medical insurance, a living stipend, group houses, and an international degree. Most students noted the importance of these out-of-academic supports, and students like Pascaline, who came from a farming family where her mother earned about $1.50 per
day, saw that Kepler was different from other universities because “most important … Kepler … is a practical based education, [and] it provides housing, stipend, and medical insurance.”

Students noted that the specialized attention they received, the use of technology, the opportunity to earn an international degree, the opportunity to engage in internships early in their educational careers, and living supports received made Kepler significantly different from other local universities.

Males

Kepler male respondents highlighted the use of technology as a major factor that makes Kepler different from other universities. Their exposure to technology on a daily basis, use of the Internet, and Microsoft programs give them a competitive edge in the marketplace. Kepler’s male students associate their experience with technology to more access to and better performance in internships in comparison to local Rwandan universities. Emmanuel, who is the first of 11 siblings not only to attend university but also to graduate from secondary school, simply summarized: “the intensive exposure of students to technology use is really what makes Kepler different from other universities. The MOOCs approach also [make] Kepler [different] from other universities.”

In addition to the ubiquitous use of technology at Kepler, male students also cited the timing of internship placement—their counterparts are generally not placed until their last year in university or post-graduation. Kepler’s earlier placement allows students to explore different careers and tie their learning to workplace skills. Jean Luc, a student who was a top achiever throughout primary and secondary school before coming to Kepler and supports his two younger brothers by funding their school fees in the northern area of Rwanda, reported that:

There are a few things that make Kepler different from other universities in Rwanda. At Kepler students are given chances to teach themselves instead of
waiting for a teacher, which increase their thinking ability and self-learning. In addition, at Kepler students are given chances to practice what they have learned in class through internships. Most of Kepler students got an internship at and outside Kepler in order to help them to put into practice what they learned before they go for jobs. Furthermore, Kepler students get enough skills and knowledge in technology because most of their work is done on computers. This makes Kepler students different from other students in other universities in Rwanda who finish their university without any skills in technology. Also, at Kepler, students get chances to work in teams at school and home. This helps those who have difficulties in some course to get help from their colleague because they stay in group houses. All of the above factors make Kepler look different and unique from other universities in Rwanda.

Santos, a student that eagerly applied for each internship opportunity that comes his way, after working as a housecleaner to get himself through secondary school echoed the importance of internships in distinguishing Kepler from other programs, “Kepler teaches students professionalism which is based on technology. Kepler makes sure that the students have got internships, and that is the real difference here. In a relation to the internship point, students at Kepler in their first year have gotten internship. However, other universities students get internships in the four or third year at best.”

Male respondents also discussed Kepler’s blended learning system as a major factor distinguishing it from other universities. Respondents described the blended learning system as different from other universities because they are not expected to memorize large amounts of material. Instead, students learn from technology, and then apply the theory or concept learned in
classes. Males also noted there were several ways in which students can get support, including feedback, office hours, and availability of instructors in person and through technology that allows students to understand their levels of performance and how to improve. Remy struggled when he first arrived at Kepler because it was his first time using a computer outside of clicking on Facebook:

The learning system here is really the distinguishing factor. Kepler uses a blended learning system with in-class facilitation (learning is done a lot by students themselves using technology, and then we come to class to make meaning of the material). Other local universities are using a more traditional learning system where lecturer gives all information to students. They are expected to just memorize the information, not make any meaning of it, push their thinking around it, or use technology to challenge what’s being put in front of them. The blended learning was hard at first, but I can already see how it’s helping to improve the way I learn and think about new ideas.

Similar to female students, male students also discussed the importance of the support they receive through living in group houses, a living stipend, health insurance, and health checkups. Innocent, who was orphaned during the 1994 genocide and grew up only with his brother in a rural town of about 300 emphasized the importance of living stipends. Innocent explained:

technology usage and student living conditions are what make Kepler unique compared to other universities. Students are well equipped with technological tools like laptops, TV screens, and the Internet. Kepler students receive a lot of support in terms of academics. However, they are really able to do well academically because of the social supports Kepler provides. By that, I mean they are providing
a monthly stipend to help students be healthy, housing, counseling, and health services. In addition, every Kepler student receives special support in case it is needed, but this doesn't happen in local universities.

Similar to female respondents, Kepler male students overwhelmingly noted that there were several components distinguishing the Kepler program from local universities. Female students emphasized the importance of the living stipend, healthcare, and housing. Male students agreed but mentioned technology as the single most defining factor of the Kepler program. Similar to female respondents, male students also discussed the importance of individual attention, an innovative blended learning model, and the chance to engage in internships early on in their academic careers. The responses all compared Kepler favorably to other local institutions of higher learning.

Rural

Many rural respondents noted the use of technology as being one of the major differentiators of Kepler in comparison to other Rwandan universities. They discussed their use of the Internet, computers, TV screens, and other modern tools that allow them to succeed in and out of class. Ezechiel, who had never visited Kigali or a big urban area before attending Kepler. “The thing that makes Kepler different is its technological learning model. For example, MOOCs are something that makes Kepler very different. Other universities in Rwanda do not use MOOCs. Students learn in classes without technology only.”

Ezechiel’s sentiments were also echoed by other rural participants. They discussed the ways in which technology influences the curriculum and pedagogy at Kepler. Francis, who grew up in Rwanda’s countryside and had to move in and out of the country’s borders with Uganda since 1990 due to the violence in the country, described the difference as:
a model that is American. We watch MOOCs on our own and come to class to
discuss [them] in workshops. We are also being provided with office hours to get
clarification, which is not found in local universities. The additional courses such
as MOOC clubs, which strengthen our ability to read, are not found anywhere else
except at Kepler. We work closely with our instructors in advisories. This enables
us to get help when needed instead of waiting until we fail a class. Additionally,
Kepler students are provided with computer. This is a rare, I do not think it exists
in any other university, at least those in Rwanda and in the areas of Uganda I know.

These comments highlight the ways in which the usage of MOOCs, a blended learning system,
and general high frequency use of technology in the classroom expose students to ways of learning
and thinking different from their previous educational experiences, as well as those of their peers
attending traditional universities. The combination of blended learning with internship placement
is also a distinguishing factor for rural students. Rural students frequently discussed that getting
an internship and applying the learning done in class generally does not happen in other
universities as it does at Kepler. Jean Claude, an eighteen-year-old student who has excelled in
mathematics noted, “something that makes Kepler different from other universities is first
providing degrees from the USA, teaching practical courses such as professional competency, and
also making sure the professional competencies course is mapped to helping students to have
internships, work studies, and jobs.”

Finally, rural students noted that earning an American degree was a unique factor. For
example, Michael, a rural student from southern Rwanda who grew up farming and had interrupted
years of education due to violence in the country and the need to support his family financially,
described several differences between local Rwandan universities and his experiences at Kepler. It was, however, earning a degree from the United States that stood out to him most.

Kepler offers a lot of support to students and this contributes to their high success rates compared to other universities in Rwanda. For example, Kepler offers housing, while no any other university in Rwanda offers this for students. It also offers health facilities and stipend to students. Again, there is no university of Rwanda I know of that does the same. Kepler uses technology as the primary tool to study while other universities do not use technology as a central means of getting knowledge. Finally, and most importantly to me, Kepler students take courses in United States of America and earn a degree from there. No other university here can claim to give a degree from the U.S. like Kepler can.

Similar to other respondents, rural students overwhelmingly saw Kepler as providing several structures, supports, and methods of learning that create a university experience vastly different than the local university experience. In comparison to other respondents, rural students specifically emphasized technology and earning a degree from the United States as what differentiated Kepler from local institutions of higher education.

Urban

Urban students also discussed Kepler’s system of learning as being significantly different than local universities. The use of MOOCs, the importance of laptops in the classroom, and the integration of technology into the daily curriculum are not present in other local universities. For urban students, the use of MOOCs signified that students have access to multiple professors and topics of learning rather than just one professor at the front of the classroom. Francine, a student from Kigali who attended a Rwandan secondary school known for its high quality said, “The way students study using MOOCs makes Kepler different from other universities. Further, the way the
students interact with their instructors both in seminars, workshops, as well as in office hours, makes it totally different from other universities. We’ve got both people here in front of us to help, as well as having access to professors from all over the world because of the MOOC and technological component.”

Urban students found Kepler’s professional competencies class a notable difference. They talked about the class and how Kepler uses it to teach the “soft skills” that aren’t often covered in curriculums. Clementine, a student who is eager to be in the workplace but is the first generation of her family of farmers to be engaged in the formal workplace, said:

Kepler is different from other universities because it offers full scholarships, it helps its students to get jobs and internships, it helps the students to get more support (office hours), it helps students to improve in technology skills, and it helps the students to act like professionals. For example, we get formal training in our professional competencies class on how to work in teams, how to use technology to solve problems, how to handle a difficult co-worker, how to engage with our bosses, and how to stand out compared to other employees. They teach us things in this class that you don’t normally see in a class, and it’s like having the key to understanding some parts of the job that we might not otherwise think about or know.

Overall, because students receive direct training on how to build a network, solve conflict in the workplace, work as an effective team member, and navigate the 21st century workplace, they see themselves as developing a skill set that is not being taught in local universities and one that gives them an advantage over students attending local universities.
As with rural respondents, urban students recognized the provision of a living stipend, healthcare, and housing contribute greatly to their ability to be successful in the model. Khaled, a student from Kigali that grew up in a two room house with seven family members, commented: Students are provided with enough facilities and this ensure that students are less stressed by external factors like living costs. This helps us focus on our studies rather than where we are going to live, get food, or take care of other basic needs.

Some students also described the social supports of student housing. Sarah described working on the rigorous curriculum and trying to solve difficult problems through her housemates.

When I’m not sure about a certain part of a project, or if I need feedback on an idea for business, I go to people living in my house. It makes me feel like I know if I’m on the right track, or people help me figure out a new way to look at the problem. It also helps me when Kepler gets really demanding and I feel like I can’t do all of the work. It’s good to know that other people are also struggling. We try and encourage each other and build a community where we can all be successful.

Urban students routinely described benefits of the Kepler program unavailable in other Rwandan universities. The presence of technology; benefits outside of academics such as a living stipend, housing, and medical care; and Kepler’s blended pedagogical model were frequently cited as lacking in other universities. In comparison to rural respondents, urban students thought professional competencies and soft skills were major Kepler advantages over other universities.
High academic preparedness

Highly academically prepared students (defined as being in the top 50% of their class after the completion of half of their first year at Kepler) regularly noted the ubiquitous use of technology at Kepler compared to traditional local universities. Respondents explained online learning was a large part of Kepler’s teaching and learning model—lectures are the primary mode of learning at traditional universities. For example, Simon stated, “The thing that makes us different is that we are using technology in almost everything we do. We learn a lot online, and then we come together to discuss it. All of my friends at traditional universities are just going to lectures and taking notes. We’re doing a different type of learning here.” Many students also discussed that blended learning (in person and online learning) was a difference between Kepler and local universities. Simon also described this difference by noting that the Kepler course facilitators are:

facilitators, not like traditional teachers. They help us make meaning of the online content and ensure that we know where to go when we don’t understand something online. They also design activities that help us use the material in a manner that encourages application and critical thinking. So, some people think we’re just doing online learning, but we’re not. It’s both the online and the in-person. It’s like we get both types of learning. But, we don’t do any lectures. We’re generally expected to be pretty active in our learning whether it is online or in the classroom.

Students also noted that they, different from their peers at local universities, who are required to sit in lectures quietly and take notes, are asked to participate in class. Respondents reported a high level of support through advisory classes, office hours, and the willingness of teachers to meet one on one. Vestine, a student who was used to being quiet in her classes before coming to Kepler and took some time to adjust to the Kepler way of learning described her class
experiences at Kepler as quite different from both her secondary school and what she hears from her peers about their learning experiences at local universities.

Kepler is so different for me compared to how I used to learn. Before, I was a good student by copying notes and memorizing facts. I could just be quiet and say back to the teacher what had already been said to me. At Kepler, they ask you to talk and explain your thinking. We have a lot of discussions, and teachers are interested to know what we are thinking. We also can’t just repeat what’s said because there are no lectures. This was a big adjustment for me. When I tell my friends at the University of Rwanda how we are learning, they say it’s basically the opposite of what they’re doing. I know it is helping me be a better thinker. It was really hard at first, though. I felt like I didn’t know how to be a good student for a while in the Kepler model. Additionally, since I hadn’t really talked in classes for my whole education, I would sometimes worry about how to do it or what to say. It is getting easier each day and I am building some confidence.

Several respondents discussed the importance of earning an American degree which is not possible at other traditional Rwandan universities. The quality of health care, housing, and a living stipend were also noted as being significantly different at Kepler compared to other universities. Pascaline summarized these topics by noting, “this is clearly different because it’s an American degree, and it I find it to be a very practical education. Moreover, they are caring about us as people by giving us a living stipend, healthcare, and housing.”

While the majority of the respondents described Kepler as their preferred place of learning, two respondents noted that there are improvements to the teaching and learning model they would like to see Kepler make. The improvements included increasing the degrees and areas of study
offered at Kepler, increasing teacher expertise, and having a more open space for students to share ideas. Carene, a student who was a refugee in the Democratic Republic of the Congo for the first years of her life due to the violence beginning in 1990 said that she liked the technology, internships, and special support she receives at Kepler when struggling. She also said, however:

I would like to see Kepler offering more faculties. Right now, we can only choose two degrees. Also, because teachers are facilitators and not content experts, they are often teaching subjects with which they aren’t familiar. This is not really something we do in Rwanda and I would like to see them develop more content expertise in certain areas. Last, I’m not sure there are enough open spaces for students to share ideas at the Kepler program about what we want to see be changed or better.

Low academic preparedness

Students at a low level of academic preparation (defined as the bottom half of the class after half of the first year at Kepler) noticed the use of technology, specifically owning a free laptop and consistent Internet use, as the core of what differentiated Kepler from other local universities. Jean Luc commented, “the fact that I never used a laptop before coming here and now have one from Kepler that I use on a daily basis makes this really different. I think that the only times my friends at other universities are using a computer is in a small lab. They are limited in both their Internet use and having a computer. We have both.”

Similarly, students discussed professional competencies as a unique feature of Kepler. They noted, different from other universities, Kepler has professional competencies and classes that specifically prepared them for the workplace. This preparation in combination with getting internships within their first year particularly set Kepler apart from other institutions of
higher learning. Sonia noted, “a lot of other universities are just focused on the theoretical part of learning. For us, we learn how to function in the workplace through the professional competencies class. On top of that, we get to apply that learning in work studies and internships that Kepler helps us with.”

Overwhelmingly, students noted that the pedagogical model is quite different at Kepler. They discussed receiving more support via office hours, advisories, and individualized coaching. That support, combined with the housing and stipends make a model that students with low academic preparation find to be quite different from other universities. Honorine, a student who was always at the top of her class despite growing up in extreme poverty and an orphan of the genocide, struggled when she got to Kepler at first because the model was radically different than any other learning environment she had been in. She explained

It was so hard for me when I got here. Everyone else was a high achiever at their secondary school, and I was used to being the best. It was hard for me to navigate the technology and the new model. However, I recognize the ways in which Kepler has set up supports for me to succeed that you just don’t find at other universities. For example, they have an advisory for me where I can discuss problems outside of the classroom. The coaching means that I talk with someone about the specific academic problems I have, and they don’t let me fail. They keep pushing me harder until I can figure it out. That, combined with the fact that I have a place to live and some extra money means even when they expect a lot out of me, they also give me the supports to be successful.

Finally, a student with a low level of academic preparation mentioned that the main reason Kepler is different from other universities is because it is not based on seat time or credit time but
instead on competencies. This is, in fact, one way that Southern New Hampshire University has pushed for innovation beyond the regular ways that American students earn degrees. It is of interest that a student with a low level of academic preparation mentioned this as the central difference in the model. The program is designed with students who may have not found success easily in the traditional American model. Sarah noted, “We have a lot of different things happening here at Kepler. But the one to me that’s most important is that this is a competency based degree. This means that we don’t have to sit in specific classes for a set time and maybe we don’t take an exam. Instead, we show we are competent in certain areas in order to earn our degrees. There is no other program in Rwanda that I know like this.”

On the whole, students with a low level of academic preparation note that the model is radically different from how they studied in the past, as well as how they see their peers studying at traditional universities in Rwanda. They note that the technology, the model, and the teaching styles are different. These differences posed a challenge for many of the students coming with a lower level of academic preparedness than their peers. While students were aware of these differences, the majority find the differences to be superior to other universities. They also note that Kepler provides much support—including individualized academic support and housing—to ensure they have the tools to be successful at Kepler. Students with a low level of academic preparedness are certainly challenged by the pedagogical model at Kepler, but most describe being able to access support in navigating those challenges.

How students learned about Kepler: Females

When asked how they learned about the Kepler program, 15 females reported they heard about Kepler from friends. Some were close friends, and others were indirect friends—friends of friends or friends of siblings. Josiane explained, “I found out about Kepler through a conversation
with my friends that attended my secondary school who were in the process of applying. They told me about process of applying. From that, I tried to search more information about Generation of Rwanda so that I could apply as well.”

Four female respondents said they learned about Kepler via an announcement. Three of them recall hearing about the program in a nearby village for orphans. For example, Annualite, a student who grew up with her mother and father but lived in an area where, because of the particularly devastating death rates in the 1994 genocide, there were many orphans, reported, “I found out about Kepler from the announcement that I found in my nearby village of orphans, which is located in our sector. Even though I’m not an orphan, people know that our family struggles and that I would be looking for a scholarship for university. So, they came and told me about it and I decided to apply.” The final female respondent said her mother learned about Kepler on a radio station and then told her to apply.

Current or former Generation Rwanda students were also sources of information for female Kepler students. Four of the respondents reported they first learned about Kepler from a Generation Rwanda affiliate. Sarah, whose family didn’t have the funds to support her, describes herself as always looking for opportunities to go to school via scholarships. She said, “a friend of my brother came to visit us at our house. He is a former GR scholar. We grew up together, and he knew I am a good student. He is the one who told me to apply, and I applied.”

One female respondent noted that she thought she was applying to Generation Rwanda under the traditional program that was in place for ten years before Kepler started. “I knew about Generation Rwanda from other attendees. When I applied, I thought it was the same program that my colleagues had gone through. However, it turned out that now all of the Generation Rwanda scholars were going to Kepler instead of traditional universities. It wasn’t until I got accepted that
I learned this was how it was. However, I needed a scholarship so I ended up sticking with that as the program.”

Lastly, one female respondent couldn’t remember exactly how she heard about Kepler. She noted that she was searching for several scholarships and that the scholarship was her main focus. The exact origins of her learning about Kepler were unclear.

The majority of female students accepted to the program heard about Kepler through their network of friends. A smaller majority also learned about Kepler specifically through the Generation Rwanda network or announcements. A few female students were more focused on the scholarship, or they applied and didn’t know exactly what Kepler was until attending. On the whole, networking and word of mouth served as the primary means to which female students learned about and applied to the Kepler program.

**Males**

Similar to female respondents, the majority of male respondents also heard about Kepler from friends who had already graduated. Of the 18 males that found out about Kepler from friends, several mentioned that their friends specifically reached out to them because they were strong students in secondary school. Jean Luc explained, “I found out about Kepler from my friend. In fact, I had one of my friends who is a Generation Rwanda scholar, and he is studying from School of Finance and Banking. This person studied at the same school with me at Nyamata High School one year before me, and he knew that I was good student with good grades but no money for university. After he learned about this Kepler opportunity he decided to share with me the information about it.”

Two males heard the information about Kepler from a radio station, which led them to apply. Damascene, who had excelled in school but missed several years of school due to moving
in an out of the country during times of instability, lost his father in the genocide. He noted that when he heard the announcement with his mother, she encouraged him to apply. “I found Kepler when listening to the radio with my mom. We heard the announcement from GR on Radio Rwanda. My mom talked about this opportunity as one being offered to outstanding and excellent students, and she said I needed to try. I applied with high interest because I am really passionate about developing rural people with entrepreneurial skills.”

Ezechiel noted, “I found out about Kepler from my father. His friend told him about Kepler and then he told me.” Four of the interviewed males reported their families were the first people to tell them about the Kepler application. One male respondent said he learned about Kepler from an institution he frequented. He reported, “I went with a colleague of mine that I studied with in secondary school to the SOS Orphanage Gikongoro in Nyamagabe district. They had signs about Kepler, so it seemed like a good idea to apply.

Similar to female respondents, most of the males noted that they heard about Kepler through friends and networks. Many of the males, however, did note that they felt they were told about the opportunity through their networks particularly because they were known to be good students, which was not mentioned by the female interviewees. Additionally, family knowledge and support played a role in how male respondents found out about the opportunity as well as their decisions to apply. Radio announcements were a source of information for some applicants, and only one found out about Kepler through a posting at an institution.

Rural

Similar to other domains analyzed, the majority of rural respondents learned about Kepler through their network of friends. Rebecca, a student who grew up and spent most of her life with
uncles in Uganda, moved to several schools as her family tried to make a living. She reported, “my friend found out about the information on the internet and then advised me to apply.”

Three of the rural respondents learned about the opportunity to apply to Kepler from family members. Pascaline stated, “I remember that my brother came in and told me about Kepler one day. I decided to apply.” Each of the rural respondents who heard about Kepler through family noted the informant was male. There were no instances of mothers, sisters, or other female family members informing rural respondents.

Generation Rwanda students were a source of information for two interviewees. Aimable, who is the first in his family to graduate from secondary school and supports his aunts who raised him, described meeting the Generation Rwanda scholars who were talking about the program. “I was on my way back from school and met two people who were visiting from Kigali. They told us that the Generation Rwanda scholarship program was going to grow into a program called Kepler where students could get a degree from the U.S. I knew I needed a scholarship because I had no money for school, so it seemed like a good idea.” The remaining three respondents found out about Kepler either through radio stations or through SOS orphans. Most described hearing the announcement, knowing they needed a scholarship, and then deciding to apply.

The vast majority of rural students heard about the Kepler opportunity through their networks, emphasizing the way in which Kepler is an orally-based and tightly knit culture, especially in the village settings. Of particular interest is that almost all friends and family members who informed students about Kepler were male. A small number of students heard about the program through either information sessions, the radio, or an institution.
Urban

Almost all of the urban students mentioned a friend or network member informed them about Kepler. Thierry, who had gone to the National Service when he couldn’t find a scholarship opportunity despite being a high achieving student for his academic career, said, “I was in the Service and then a friend came and told me about the scholarship opportunity. I was so excited about a scholarship and an American degree that I decided to apply right away.” Frank, who grew up in Kigali and always had an interest in technology, said, “I remember that I heard about it from a friend and then he sent me a link to apply. I did it right away. I was excited that it was an online program.”

Three people heard about the program from Generation Rwanda scholars. One heard about it on the radio, but, on the whole, friends and networking were the primary way that urban respondents learned about Kepler.

High academic performers

With the exception of four respondents, all highly academically prepared students learned about the Kepler program through friends. Robert, a student whose community members pooled together money throughout his primary and secondary school career after he lost his parents to instances of sickness and conflict, at the age of seven, reported, “I found out about Kepler from friends who heard information about scholarships and then they told me to apply. I went to an office nearby, where they had postings about Kepler, to ask for information and then apply.”

Two of the highly academically prepared students learned about the program from family members—a father told one student about Kepler and another heard from her brother. The remaining two respondents that did not hear about Kepler from either friends or family members learned about the program through a radio announcement.
Low academic performers

Students with low levels of academic performance heard about the Kepler program through networks, including friends or Generation Rwanda students. Didi, who hails from Kigali’s bustling Nyamirambo district and lives with her mother and four sisters whom she supports with school fees, noted, “I found about Kepler with the information from my friend. He told me that there is an NGO offering scholarships to go to America for vulnerable students. That's how I knew Kepler, and I decided to apply because I thought I fit that profile and was in need of a scholarship for university.” The remaining two students with low academic performance heard about Kepler through their family members.

As with other domains, students with low academic preparedness mostly heard about Kepler through their networks. Students with low levels of academic preparedness had more friends from Generation Rwanda scholars than other domains had. A small number of respondents heard about the program from family members.

What Kepler Needs to Improve: Females

When asked about what Kepler needs to improve since they began at Kepler in 2013, several female respondents highlighted that Kepler needs to improve its course facilitators. Specifically, a majority of respondents noted teachers are not specialized in the field they are teaching. Kevine, who struggled in the beginning of the program because of psychological stress and a lack of familiarity with technology —she had not used computers during her primary and secondary school—stated, “I’d request Kepler hire teachers that have more content expertise. Then, students will benefit more within their experience as professionals in the domain they are teaching.” Clementine echoed this sentiment, stating, “Kepler needs to improve by hiring
instructors who fit the courses they are going to facilitate. For instance, if it is someone who teach accounting, it will be more helpful if he/she did accounting in his studies.”

Some female students emphasized that Kepler needs improvement in the information given to applicants before applying. Many noted that they were told that they could study general management at Kepler when they applied, but this changed midway through the program. Josiane, who had applied to Kepler to study management, expressed her disappointment. “One thing about the Kepler program that needs improvement is to tell people the truth about the faculty that they are going to study before applying.”

Another theme that emerged among female applicants is Kepler’s need to end the deduction of living stipends as a punishment for not following school rules and policies, Sonia noted, “Kepler needs to think critically about punishment method of deducting stipends. So, I suggest that if possible they can choose other punishments instead of deducting our stipend.” Other respondents also echoed this sentiment and wanted to see other methods of receiving consequences for not meeting the expectations for the Kepler program. When pushed to give examples about better methods of punishment, however, respondents were unable to produce specific consequences they preferred as alternatives to stipend deductions.

A few female students desired improvements in scheduling courses, or the schedule and workload in general. Raissa, who was used to being a top achiever in her classes during primary and secondary school, despite the stressors of poverty like missing school due to school fees and supporting her mother and father periodically when they could not find work in the formal or informal sector, explained, “The thing which needs improvement at Kepler is to plan a schedule which can give students time to rest. For example, if I have to study from the morning up to the evening 6:45 PM, I get stressed out. As a student I need to get a time to do my work, self-study
and plan for the next courses. So, if I get overloaded in my time, it makes me feel stressed, which in turn hinders my performance in these courses that I take. Thus, students are more stressed with a lot of homework and the tight, demanding schedule they have at Kepler.”

While only a few respondents mentioned it, some female respondents wanted to see a more organized and hygienic environment on Kepler’s new campus. Pacific summarized her perspective: “the physical organization in class needs to be improved. Chairs are scattered everywhere, and hygiene is at a low level.”

Female respondents noted several areas where Kepler can improve, with the overwhelming sentiment being that the most important improvement would be to hire course facilitators who have either content expertise or at least some work experience in the field they are teaching. Female respondents also expressed frustration with Kepler’s information about what they would be able to study in relation to the reality that they found half way through their first year in the program. Lastly, a small number of students noted the schedule induced stress, which hinders academic performance; a small number also wanted to see the physical organization and hygiene of the campus improved.

Two rural respondents wanted to see Kepler improve its ability to take feedback from students and fold it into the institution’s decision making process. Rebecca felt it was hard to keep track of Kepler’s multiple expectations: “I think the administration needs to improve on the way they set their policies. They need to at least consider student voice in their policies.” Innocent expressed a similar desire for more student feedback and communication with the administration, stating, “I think there should be some sort of group that brings student perspectives to the administration, and then they can hear and consider them, and report back on those thoughts to the students.”
Two rural male students felt the administration used emotion and favoritism while making decisions, and it needed to improve the relationship dynamic between staff and students. Dieudonne, who had experienced the consequences of not meeting Kepler expectations and found it hard not to be at the top of his class after holding that spot for most of his primary and secondary education in rural Rwanda, explained, “Kepler needs to improve the way its administration takes decisions. Mostly, the administration takes decision with some emotions differently to different students. It is not good to have particular friendship with some students more than others because it leads to students to think that some are loved more than others.” Robert expressed a similar concern about relationships between students and staff, stating, “Kepler could use a lot more improvement in the relationship between staff members and students. This would consist of helping students feel comfortable with staff members and take them as people who are there to help them not to scare them.”

Lastly, one rural respondent wanted to see an increased number of native English speakers in the classroom to help the students improve their language skills. He said, “It is good to have a lot of Rwandans on staff, but I also think that for us students speaking in English is really hard. So, we need more native English speakers in order to make sure the students can get good at the language.”

On the whole, rural students most frequently reported that Kepler could improve by hiring course facilitators that are content experts in the areas that the teach, especially for instances when students want to delve deeply into subject matter. Other areas of improvement noted by small groups of respondents included the Internet connection, removing stipend deductions as a sanction, incorporating more student feedback into policy discussions, improving relationships between students and staff, and increasing the number of native English speaking staff.
**Males**

Similar to female respondents, a majority of male respondents felt Kepler needed to improve its hiring practices as a means to improve the program. Several male students felt their teachers were unqualified to teach content. Innocent noted, “In terms of improvement, I think Kepler should be recruiting people in the field related to the courses that Kepler offers. For instance, it is a good idea to hire someone with a background in accounting or finance to help understand the concepts in the MOOCs for those courses.” Jean Claude echoed this sentiment:

I think Kepler could make some improvements by having instructors or course facilitators who are experts in what they teach. This is because sometimes, due to courses such as macroeconomics, finance, accounting, etc., students need to understand them well—and their concepts—as some of the students come at Kepler from other different options like sciences or languages. Therefore, if Kepler considers having experts in its courses, it can help students understand the courses well.

Male students noted a gap in communication and planning. For example, Khaled wanted to see more curricular planning and clarity. “I think Kepler would consider improving on the side of academic stuff. I think it would be better if we know about the curriculum we follow—both the planning and how they are telling us about it.” Specifically, male students mentioned they wanted to see increased communication between students and the Kepler administration. Michael, a student who in the first year of the program felt that decisions were sometimes made and not always clearly communicated, explained, “Kepler needs improvement in its communication between students and administration. For example, it should have a students’ committee that has some input and can bring information back to the students or answer questions. I would like to see
decisions made by more than only two or three people. I would also like us to be able to discuss
different concerns of students with the administration.”

Some male students mentioned dissatisfaction with stipend deductions as a means to
punishment for not meeting Kepler expectation. Eric, a student who struggled to meet the typing
expectations seven months into the program, offered:

Kepler needs to improve the way it takes decision on whether to cut stipends for
students unable to type. This is because cutting stipends impacts students
psychologically. This means that even if a student can be type 50 words per minute
as expected by Kepler, he or she cannot type because he or she types thinking the
amount of money that is going to be lost. As a result, I think some students end up
typing less words because they are fearful and shaking. I say this because it
happened to me. Even if I passed, I experienced this problem. I think Kepler can
find another way to make students type rather than cutting down the stipend.
Basically, the stipend deductions impact them psychologically. They don’t need to
be deducted in order to master the typing.

Two male respondents discussed at length Kepler’s need to reduce the number of times
students were reminded of the financial support they were receiving in the Kepler program.
Aimable felt offended by the reminders about the benefits of the program in relation to the
program’s expectations. “I wish that Kepler would reduce the excessive reminder about support
that we are getting. I think that every students knows that he or she is being helped, and it is the
opportunity to make our studies possible. Then, there is no need of reminding us always that we
give money always. At least, it is better to say help instead of saying money.”
Lastly, some male respondents also wanted Kepler to improve the Internet connection. Aimable reported he struggled to turn assignments in on time on several occasions because of poor Internet connections, and described the problem as impacting him on an almost daily basis. “It is obvious that the Internet is the problem at Kepler. This is because it is difficult to have reliable Internet connection when 50 students are connected to it in the same room. Then, we can’t do our work, but the expectations here are high and demanding.”

Overall, the majority of male respondents thought hiring subject matter experts was crucial to improving Kepler. While that was the central concern, several interviewees also discussed improvement in planning and communication between the Kepler administration and students, finding alternatives to deducting stipends for missing program expectations, reducing the number of reminders around financial support, and improving Internet connections.

*Rural*

Similar to the gender findings, rural respondents overwhelmingly felt it most important for Kepler to hire content experts as course facilitators. Several noted that the teachers seemed to feel uncomfortable in classes or couldn’t answer student questions, which students expect from classroom leaders. Marie Chantal, a student that worked in the informal sector for four years because she couldn’t afford university education and needed to fund her father’s life-saving surgery, described her experiences in the classroom during these moments as a desire to be able to explore knowledge in more depth.

We are having basic knowledge in different courses like finance, accounting, etcetera. Well, I think this is good. But at the end of the day we are not able to use this knowledge because we are not really good at knowing it yet. I think this is caused by the fact that those classes are being provided by instructors who do not
have backgrounds in the content areas. They watch MOOCs as we do, and then sometimes they face difficulties to go in deep when teaching and explaining. If they don’t have the deep knowledge or are watching the same thing we are, then we are not necessarily going to have deep knowledge either.

Francis, who is by nature a curious learner and likes to delve into the detailed areas of his subject matter echoed Marie Chantal’s sentiments. “I think the improvement that Kepler needs now is to search for professionals or teachers who have expertise in different fields. Sometimes, in my classes, it happens that when a student asks a question to an instructor, the instructor is not able to clarify because he is also not expert in that area. Therefore, it would be great if the instructors and course facilitators are experienced rather than giving him a course to facilitate which he also does not understand.”

Some rural respondents agreed the Internet needed improvement. When all of the students are trying to connect simultaneously, respondents found the connection to be particularly poor. Ibrahim, who had only connected to the Internet before coming to Kepler through a center that was a seven mile walk from his village, said:

Simply put, Kepler needs to find a way to improve the Internet connection for the program to get better. The issue is that we have connectivity problems in Rwanda and in Africa generally. But, to do this kind of program using the Internet so much, it gets really frustrating when we’re all in the class and then we can’t connect and can’t do the work we need to. It’s already a really hard program and then when we can’t connect it makes me feel like it might be impossible.

In addition, a few rural students noted Kepler’s sanctions for not meeting expectations needed to be changed. Aimable felt he was doing his best to meet the demands of the Kepler
program and needed his stipend to help his family and ensure his own basic needs. He did not feel the sanctions were fair for not meeting typing expectations.

There is a problem regarding stipend deductions. Students will not meet typing expectation just because of stipend deductions. This is negative reinforcement which will become familiar to students. I think Kepler may think other ways that students can meet typing and other every course.

Urban

As with all other domains, urban respondents reported that Kepler should foremost hire course facilitators with content area expertise. Respondents mentioned the teachers are not specialized in the field they are teaching. They requested teachers that have either content expertise or professional experience. Thierry noted:

I think the administration should improve in terms of teachers they hire. Teachers teach courses that they are not comfortable with. Some course facilitators facilitate courses that they not that experienced in, which leads to uncomfortable moments. They should hire teachers who students will benefit more from either their knowledge or professional experience in the domain they are teaching. In addition, Kepler emphasizes they’d like to have students apply what they have studied in the workplace, but if your teacher hasn’t worked there, their feedback might be less valuable.

Some urban students expressed a desire for degrees in more subject areas. Didi noted, “the Kepler program needs to increase the number of faculties offered at the university. This is because there are many people who want to attend this university, but because there are the faculties that they don't like, they don't attend. Moreover, some of my friends said it will be better
if Kepler has multiple faculties so that students can join to study a subject he/she wants to learn about and work in.”

Urban respondents also highlighted that Kepler needs to improve the accuracy of information about the programs available when students are applying. Several urban respondents expressed disappointment being told midway through their first years that management was no longer an option. Nicole, a student who is from Kigali was offered a scholarship at a traditional university but turned it down because she wanted to earn a management degree from the United States. “Kepler needs to always tell the truth about what they offer in terms of faculty before students apply. For me, I came here to study business and management. Suddenly they said it wasn’t available when they said during the application process that it was. This made me feel like I wasn’t sure I could trust what Kepler said.” Several other students expressed disappointment in Kepler program offerings, particularly if they had given up another scholarship opportunity to attend Kepler’s program.

Similar to other respondents, there were urban interviewees that felt Kepler should end stipend deductions for students that did not meet Kepler rules, policies, or academic expectations. Jackie simply stated, “Kepler shouldn’t recruit poor students, give them a stipend to get by recognizing that they need it, and then take that stipend away from the students. This is not fair, and when students are struggling academically, that may be when they need the stipend the most.” Some students also noted that they felt demeaned when Kepler took away their living stipend for programmatic violations.

Lastly, several urban respondents mentioned that Kepler needed to improve the frequency and quality of communication between the students and staff. Students felt the need for more information about Kepler events, policies, and news. Jean Luc, who while he enjoyed the
challenges and learning of the Kepler program, also felt a level of uncertainty about the future directions and requirements of the program.

Kepler can improve by giving us a clear projection of what might happen next and informing students early of any changes. This is because most of the things at Kepler tend to happen without students being informed or informed late. For instance, we don’t know whether we will still live in student group houses for the rest of our years at Kepler. This makes difficulties for us since we cannot plan ahead of time. In addition, most of the students are wondering about what will happen to students who will finish their bachelor's degree before three years. Will these students still attend Kepler courses or not? This is because most of these types of information have not announced to Kepler students yet. This means we can have some anxiety over what might happen next, since we don’t know.

The majority of urban respondents noted that Kepler could improve by hiring course facilitators that have content area expertise. In addition, some respondents also commented that Kepler could increase the number of degrees or areas of study offered, halt stipend deductions as a disciplinary measure, and increase program planning and quality and frequency of communication about Kepler program policies and planning.

**High academic performers**

Kepler’s high academic achievers frequently noted Kepler administration should improve the hiring process of course facilitators by ensuring teachers were content area experts. Several high achievers noted that Kepler course facilitators were unable to help them with difficult subject matter or by delving into subject matter that was particularly difficult. Specifically, many students with high levels of academic achievement at Kepler felt their course facilitators could not explain
any of the topics that were being studied in depth because of a lack of knowledge or experience in the field. Carene explained the phenomenon of student sentiments around course facilitator expertise by stating:

> It would be better if Kepler had teachers assigned to lead courses that they have studied in their background. This will help many students to be successful as the result of being taught by experts in their fields. Currently, this is not the case, so there are moments of discomfort between the teacher and the student, and the student has to look elsewhere to get more explanations on the hard questions she or he might have in class.

Some highly prepared students also emphasized the necessity of increasing the Internet network speed and making sure that each student computer could be connected while on the Kepler campus. Annualite, who already found the Kepler model to be new and challenging noted:

> This is already hard enough. But when we can’t connect and the expectations are also high, it makes me feel like I wish Kepler would do something to increase the connectivity of our computers. When we are all online, the network kicks a lot of us off. So, the Internet doesn’t work, but the Kepler expectations remain the same.

Similar to other respondents, high academic achievers wished they had more accurate information about Kepler’s programs from the beginning. They also desired better communication between the Kepler administration and students, as well as wishing that Kepler would increase the number of degree offerings within the program. Clementine summarized this by saying, “I know we are getting a better education than in local universities. But that doesn’t mean we don’t wish we had better communication, more accurate information about the programs Kepler is offering, and just a better understanding from administration as they navigate the Kepler program.”
Students felt the best way to make improvements within the Kepler program was to increase the number of teachers that have content expertise in the Kepler courses and programs offered. Outside of that, high academic achievers reported they’d like to see improved Internet, communication and improved accuracy of information from administration.

**Low academic performers**

Students with low levels of academic preparation at Kepler also overwhelmingly noted that Kepler could improve by changing its hiring practices to ensure teachers with higher levels of content expertise. Marina, who despite growing up in extreme poverty in Kigali had a lot of options for college scholarships because of her high levels of academic achievement stated:

I’m really happy to be here because this is a different model and we’re getting much her expectations and skills compared to other programs. But still, sometimes I am surprised when a teacher can’t answer a question or help me with in depth areas around what we’re studying. In those moments, I feel disappointed and that it’s pretty clear this is the main way that Kepler could make the program better.

Kepler students with lower levels of academic preparation also expressed a desire to have improved communications and relationships between Kepler staff and students. Ibrahim explained:

I am sometimes trying my best but can’t do everything that they ask. Sometimes I feel like they haven’t told me what I needed to do, or they didn’t tell me in a way that I’m clear about what needs to happen. Then it just feels like we get a lot of punishments if we don’t do the right thing in the Kepler program. So, they expect a lot and as soon as we don’t do it we are in trouble.
Last, some students with low levels of academic preparedness described their difficulty with the rigors and demands of Kepler’s schedule. They often felt over exhausted or that there was not enough time to decompress given the stress of the program, which in their perspective lead to lower levels of academic achievement. For example, Didi said:

I work so hard all day and go to bed really late. Then I wake up early to do the same thing again. It is just a lot in terms of the class schedule and I think my family doesn’t really see a lot of me. We work and work and there is no time to just relax or have a break. I sometimes think that it’s too much, and I feel in these moments it makes me do worse in my classes or makes me feel like I won’t make it in the program.

Chapter 4c: Ethnographic data findings
This section will describe observations of the Kigali program, as well as those made at a traditional university in Kigali. The experiences of the students, expectations of the school, and use of technology will be among the central themes explored. Connections between age, poverty, previous success in school, and one’s belief in his or her ability to progress out of poverty also be explored through these observations.

All data from this section are drawn from notes during Kepler staff, student, and teacher meetings, from proposals, articles, employment statistics, and other on-line public data sources about Kepler, notes from working with local universities, notes from observing student housing, notes from wellness and employment meetings, and direct participation in meetings and events between August 2013 and December 2015.
Recruiting and Admissions

Review of the ethnographic data collected on Kepler revealed the university program uses gender quotas in its admissions process to ensure half of each admitted class is female. The quota system mimics legislation mandating minimum levels of female participation in government. There are no quotas, however, for participation in university education. The participation of women in local universities is much lower than at Kepler, where enrollment is 50% female and 50% male. No local university has enrolled more than 30% females in the last 10 years. Ninety-eight percent of Kepler students have earned their Associate’s degree within two years, with one student still working towards her degree after becoming pregnant.

Kepler’s admissions process is competitive. In 2015, the university program received 7,000 applications for 150 slots. The process includes an initial application, and from that 1,200 students are selected to take a Kepler-written admissions test, which includes listening comprehension, basic math and English skills, a critical thinking section where students read multiple articles and apply the information in questions, and an essay section. Roughly half of those that take the test are then selected for an interview. From the interview, the final candidates are selected. In Kepler’s admissions process, males and females are separated out into separate spreadsheets, where half of the cohort is chosen out of the males and half from females. Kepler will not take applicants that are not qualified (beyond a minimum score). The admissions process has meant, though, that the female students tend to come in behind the male students. Kepler then designs curricular

---

2 The Rwandan structure of Parliament is bicameral. There are legislated quotes for the single lower house (Chamber of Deputies). The legislated quoted is 30 per cent, but Rwanda surpasses this number and in fact has the highest percentage of women in Parliament in the world. After the 2013 elections, 51 of the 80 seats were taken by women, comprising 64% of the chamber. At the Senate level, the Rwandan Constitution also legislates a 30% quota for women. Currently, of the 26 seats, 10 from the 2011 election are held by women, constituting 38% of the Senate. Last, at the subnational level, 30% of all District Council members are legislated to be women (Quota Project, 2016). While Rwanda has been lauded for having the highest number of women in Parliament in the world, some criticism has emerged that the Parliament is a “rubber stamp” body following the desires of other politicians in power—this criticism was at its height in 2015 when Parliament did not pass a measure for all women to receive 12 weeks of family leave.
interventions such as single gender classes, coaching, and individualized academic support to ensure female students can excel.

In the original class of 27 students at the Kiziba refugee camp only five were women. Gender is not balanced on the Kiziba campus as it is at the Kigali campus. While Kepler tried to separate out gender in the same manner it did on its Kigali campus, the women were not qualified enough to succeed at Kepler. In response, the school designed and implemented a “Women’s Preparation Program” for the Kiziba campus to increase the likelihood that females residing in the camp will qualify.

Kepler makes similar efforts in its recruiting and admissions process to include an equal number of rural and urban students. While the institution doesn’t separate out urbanicity and create a quota, it visits six places across the country to ensure rural students have information about the test. It also administers the admissions test in those six areas as well as the country’s refugee camps to ensure rural students have access to the testing process. As such, this resulted in a little over half of the first cohort hailing from rural areas. Kepler has not tracked urban and rural data, but students feel there continues to be a balance between urban and rural students.

On the whole, Kepler’s admissions process and subsequent curricular and programmatic interventions take great care in creating gender balance and equity on the campus. The program continues to work with researchers and consultants to refine and improve its gender based initiatives, regardless that they are substantially more advanced than local universities. Similarly, Kepler prioritizes ensuring urban and rural students have equal access to information about the program and can take the test. The campus has relatively balanced numbers of students when considering urbanicity and gender.
Student Housing

One of the central components that differentiates Kepler from other universities is that it provides group housing to students. These houses are located near the university and are private homes rented out by Kepler. The houses are single gender and can have as few as eight residents and as many as 40, depending on the size of the house. The housing comprises a central part of the program for students both socially and academically. Teachers have assigned study groups according to houses, and counseling sessions are sometimes also organized by household. Students also frequently discuss the housing as not only a place where they can get their school work done but where they also depend on each other for support and form relationships that help with the difficulties of being in a new and demanding school environment.

At the end of its first year, Kepler decided to integrate students from its first cohort with those from the second cohort. The first cohort of students was vehemently against the idea, stating that they couldn’t continue to be successful in school without the relationships they formed during the first year. Kepler administration, however, felt that integrating the cohorts and ensuring the new cohort had support from the first was an important programmatic component. In addition, the housing was also organized with consideration to urbanicity, English levels, technology levels, and perceived ability to work together. Kepler also defined structures to assist the students in living together successfully, including identifying house leaders to solve problems, technology leaders to assist with technological challenges, and later hiring work study students to function as hygiene coordinators to ensure houses were meeting healthy living standards. While the first cohort was not initially pleased with the change, a few months after their new living situations were implemented, they reported high levels of satisfaction with their housing and having made new friends.
The houses are purposefully rented to be as close to one another as possible and no further than a thirty-minute walk from campus. Furniture and an Internet connection are provided so that students can work from their houses. Students live in shared rooms. Medical or psychological issues can on a case-by-case basis create exceptions.

In the first year of the refugee camp campus, Kepler decided not to provide housing to students because they were already receiving housing from the UNHCR. Kiziba students report challenges and frustrations with getting their work done or being able to contact peers when they need help. They are strongly advocating for housing in the Kiziba campus program.

On the whole, the housing at Kepler Kigali’s campus provides a solid foundation for both academic and social growth. It is a source of social events, problem solving, team work, social/emotional support, a space where students can collaborate on group projects, and get help with difficult assignments. It also serves as a space where new Kepler students learn about the program requirements, technology systems, and generally understand the ways in which Kepler’s program is radically different from those they have participated in before. The lack of student housing at the Kiziba program has been a source of stress for the students at the refugee camp, and issues completing homework and strengthening social networks have been noted. While a second cohort has not yet joined the Kiziba campus (the program is in its first year), it may also be more difficult for new students to learn about the program, build relationships, and get assistance without the housing exposure to the first cohort.

The Nexus between Kepler and Employers

Kepler has a system of preparing students for work with positions earned by students and specific curricular components that directly prepare students to be successful in the workplace. To earn an internship that often turns into employment—over 80% of Kepler’s first cohort of students
are employed without yet having Bachelor’s degrees—students first start with work-study positions. These positions are usually at Kepler and include performing administrative tasks, technological tasks, greeting visitors and giving tours, providing on-line mentoring services for students, and acting as facilitators for partnerships. Once a Kepler student successfully completes a work-study position (students are graded on Kepler’s 5 traits), he or she can apply for an internship at various companies throughout Rwanda, as well as apply for on-line and virtual internships internationally. Kepler students have been interns at international banks, local non-profits, start-ups, and as research assistants to international and local students. Internships are three months in length and may be paid or unpaid. At the end of the three months, the students must either be hired or the company can have a new intern. Kepler implemented this policy to combat the practice common in Rwanda of keeping on an intern for years at a time, delivering nearly free labor for companies. They compensate these de-facto employees with only transport and lunch money.

The structure of the internship program is important but equally important is the role Kepler plays getting students internships. There is a lead teacher, volunteers, and executive level management working on the internship program. They meet with employers on a regular basis to advocate for Kepler students. Since it is common practice for Rwandan students to get an internship only during their last year of study or after graduation, Kepler is making a significant cultural shift in how companies are considering and employing interns. Additionally, when an employer is struggling with a student, Kepler will meet with the employer to work out problems and support both the employer and the student, if necessary. Kepler also collects testimony from satisfied employers and shares it with other employers. The school has held happy hours or dinners for employers to thank them and get feedback. And, in the inaugural year of the Kepler Kiziba
campus, a happy hour was held for partners and potential employers even though Kiziba students were not yet at the internship phase of the program. Kepler brought the CEO of a start-up in Kigali to the event to share his experience in working with Kepler students to persuade local employers to consider Kiziba students for future employment needs.

On the curricular front, Kepler provides classes to prepare students for internships and discuss important topics that arise in internships. Kepler also offers “professional competencies” as a core course throughout the student’s entire first year at Kepler. The goal of the course is to teach students the soft, or professional, skills that many middle- to upper-class families are taught in their upbringing. Topics include timeliness and communication, how to introduce oneself and the importance of first impressions, how to network at meetings and follow up, how to handle conflict in the workplace, professional email communication, etc. Students are not allowed to enter the workplace until they have mastered these basic skills. It also engages employers to understand the trends and learning needs of employees and modifies the curriculum accordingly. For example, when employers said they were impressed with the Excel skills of several students and would like to hire them on as accountants but the students did not yet know how to use QuickBooks, Kepler implemented a QuickBooks module to move forward in their internship or work positions.

Last, it is important to note that Kepler encountered significant struggles when it began the internship and employment programs, which were at the intersection of the internship/work program and the curriculum. First, students performed so well in their internships that many employers wanted to hire them. Kepler then adjusted the amount of time spent in classes, enabling students to work. Students, however, did not have the same type of support in the workplace as they did at Kepler, and several employers started to notice problems cropping up with work ethic,
timeliness, and lack of humility. Presently, Kepler is working on refining its connection between academics and internships and work to ensure students are adequately supported and can be successful in the workplace.

**Provision of Monetary and Non-Academic Services**

Besides the housing structures discussed earlier, Kepler offers a package of services and support that are not necessarily academic in nature but are designed to remove poverty stressors and enable academic achievement. These services are lacking at local universities.

Kepler offers students a monthly living stipend of 40,000 Rwandan Francs, or approximately $53. This money is intended to cover food, transportation, and other incidental costs for students. Stipend spending is not regulated by Kepler staff. Some students have saved their stipend to start a business, others use it to support their families, some use it for fun, and some save their stipends to make larger planned purchases, such as Air Jordan sneakers or items for their families. Students report the stipend ensures that they don’t have to stress about funds for meeting their basic needs. The use of the student stipend is varied—some may spend all of their money within a week, and others plan carefully. According to the World Bank’s 2013 statistics, Rwanda is a low-income country and the average monthly salary of an individual is $58.33. Kepler students, therefore, are studying, have housing paid for them, and have a stipend that it almost as high as the average Rwandan monthly income. While it is still not a lot of money, Kepler staff and students often note that it offers a great support.

Kepler also offers a clinical psychologist and nurse on-site to assist with student mental and physical health needs. These services standard in the American context, but they are seldom found at other local Rwandan universities. In fact, despite the well-documented mental and physical health needs following the 1994 genocide (Rugema, Mogren, Ntaganira & Gunilla, 2013;
Rider & Elbert, 2013; Neugebauer et al., 2009; Schaal, Weirstall & Dusingizemungu, 2012), there is a shortage of mental and physical health care workers in both Rwandan universities and in society generally. According to Rugema, Krantiz, Mogren, Ntaganira, and Persson (2015), there is a shortage of physical and mental health care workers. In 2011, only 1.30 nurses per 100,000 inhabitants, .05 psychiatrists per 100,000 inhabitants, and .07 psychologists per 100,000 inhabitants existed in Rwanda. In all, evidence based treatment is not only a rarity within Rwandan universities, but society as a whole, especially given the country’s traumatic history. The presence of a nurse and a clinical psychologist is a luxury in the Rwandan learning setting.

Health care checks with the school nurse are mandatory at Kepler, although compliance with advice is less than 100 percent. Psychological services are optional. While there is a massive stigma about receiving mental healthcare services in Rwanda, students that access counseling report it to be helpful. In fact, during Kepler’s first year, the university only contracted out mental health care services. After reading a report outlining major stressors and post-traumatic stress disorder from the psychologist at the end of the first year, Kepler decided to hire a full-time clinical psychologist.

Additionally, Kepler offers a lunch service to all students on campus. In the program’s first year, administrators noted that several students had lost significant amounts of weight despite being given a two-hour timeframe to go home and prepare lunch, as well as a living stipend to cover costs. Given that Kepler doesn’t have cafeteria or kitchen facilities, importing the lunch on a daily basis is logistically challenging. Program administrators, however, decided at the end of the year that lunch was essential for the health of the students. At first, the program began by
Kepler covering half of the cost of the lunch and deducting the other half from student living stipends. However, at the end of the second year of the program, Kepler management decided to fund the cost of the lunch fully.

Kepler also offers a range of wellness services, including nutritional awareness and hygiene campaigns, sports teams, exercise programs, and a mandatory “sports participation” on Fridays. These programs are often led by students and are designed to address the well-being and general health of students through education and activities. Students often take leadership roles in these programs through volunteering, work study roles, or official internships with Kepler.

On the whole, Kepler aims to provide services that meet the needs of students outside of their academics—including those related to finances, health, and wellness. While some of these provisions are under consideration and modification as Kepler studies the impacts of the program and its services, the institution has shown a commitment to addressing the whole student to help students find academic and personal success.

**Student Age in the Kepler University Program**

Compared to traditional university programs in the United States, the average age of the Kepler student is usually higher than that of most institutions in the US. This is because several of the students have experiences interrupted formal education during their primary and secondary school years due to poverty, conflict, movement, and refugee status.

On the whole, Kepler students are older than a traditional university student upon their entry to the program, and have experienced more economic, psychological, war-driven conflict than the typical student in a developed country. This adds an extra dimension of challenge when attempting to be successful in earning a degree from an institution located in the United States.
Student Poverty Status at Kepler

Kepler aims to recruit and admit students coming from vulnerable backgrounds. It uses the Rwandan poverty index, *Ubudehe*, to measure poverty. In past years, this system has been contested and even changed by the government. There is a general consensus among many students that since 2013, Kepler has begun to offer admission to students that are not Rwanda’s most vulnerable. On one hand, this diversifies the student body at Kepler. On the other, the program may not be serving the “most vulnerable” as it aims to. For example, when adding Burundian applicants to the 2015 cohort, the admissions team conducted needs assessments. While the team found that students came from various backgrounds (from the neediest to those able to fund a significant portion of their education) Kepler management decided to give all students the same financial package. While most students in Rwanda and Burundi who cannot afford to go to Europe or the United States may be considered “needy” by U.S. standards, a wide distribution of need was found in the Burundian applicants—there, home visits were done because of the lack of the Rwandan *Ubudehe*. Kepler decided to serve students of varied economic backgrounds. On one hand, economic diversity assists the students with understanding those from different backgrounds. On the other, my observations suggest that the program may not currently be meeting that goal.

Academic Performance Before Entering Kepler

The admissions process at Kepler is highly competitive. In 2015, the acceptance rate to Kepler was lower than that of Harvard. Thus, while the students at Kepler are from vulnerable backgrounds, most Kepler students are accustomed to being the top achievers in their class. This makes Kepler students entering the program confident in their abilities to succeed academically, but when they are confronted with a peer group of students on the same level, those that do not perform at the top tend to struggle psychologically and academically. Several students that were
not high achievers at the beginning of the program reported they experienced feelings of low self-esteem and did not believe they would make it through the program. This, in turn, affected their academic performance. In addition, students who do not perform well academically may not apply for work-study or internship positions. Some students will seek counselor support, while others struggle to navigate the experience on their own. Students report feeling dejected, lonely, and overwhelmed when they are not top achievers. This can, in turn, affect their belief in their ability to make progress in the program and, ultimately, out of poverty.

**Observations of Kepler and Other Universities**

On several occasions, comparisons have been made between Kepler and traditional Rwandan universities. These include students that have peers at other universities, staff that have attended universities in Rwanda, and staff that interact with other universities for contractual work or at events.

On the whole, Kepler has much more rigorous expectations than local universities. For example, Kepler expects students to come to class five minutes early, imposes attendance penalties on grades, and runs several small classes where instructors know students and provide feedback. Most note that at traditional universities, the attendance of both professors and students is sporadic, and classes are large.

Another glaring difference between Kepler and local universities is Kepler’s heavy use of technology. Other local universities may have one computer lab of 25 computers for thousands of students. Technological tools are seldom used in class by either teachers or students. This is a stark contrast to the Kepler Kigali and Kiziba campuses, where all students have laptops and assignments are accessed and submitted on-line, and content is accessed from both in-person facilitators and on-line. Employers also note that Kepler students are much more fluent with
technology then a regular Rwandan graduate—they can type, use Office functions, and know how to conduct reliable research on the Internet.

Lastly, the learning at local Rwandan universities is theoretical, whereas the Kepler model emphasizes the practical. Much of the learning done at local Rwandan universities uses a route memorization model. At Kepler, students do not engage in lectures, but instead are expected to apply their learning through projects and team tasks.

Overall, the presence of rigorous time and attendance procedures, high academic standards, ubiquitous technology, and active learning experiences differentiate Kepler from traditional universities in Kigali. The model is drastically different from what is happening at other local higher education institutions.

The role of course facilitators and qualifications of course facilitators at Kepler also varies greatly from other universities. At a traditional Rwandan university, one generally observes both the students and professors conceptualizing the role of the instructor as a “sage” who is the holder of all knowledge. In this model, the pupils are encouraged to listen to the professors, take notes, and ask few to no questions. Additionally, the professor is considered the ultimate expert in the classroom, and instruction is delivered in a lecture format with the professor sharing his or her expertise with the students, while the students take notes and try and absorb the expertise. There is little space for students to disagree with the instructor as expert, nor to engage in any kind of debates or in-depth discussions. In the traditional Rwandan university setting, the professors hold Doctorate or Master’s degrees. They only instruct in their field of expertise, and there are few—if any—multi-disciplinary courses.

Kepler’s course facilitators, however, take on a very different role than what is observed in traditional Rwandan universities. First of all, the technical faculty according to accreditation in
the United States are the Southern New Hampshire University assessors that evaluate and provide feedback on the CfA projects. These individuals have no less than a Master’s degree and are considered faculty at SNHU by both the university itself, as well as the accrediting bodies in the United States. On the ground, Kepler hires course facilitators to assist students in their learning—both through leading classes and by providing coaching for students to help them digest and apply the feedback given by CfA. Technically, course facilitators are then considered supplemental resources to the “faculty” at SNHU. On the ground, course facilitators also provide coaching for students in the employment realm, visiting them at their place of work, conversing with employers to gather and apply feedback, and subsequently coaching students through their employment placements.

Kepler does not use any set criteria for the credentials of its course facilitators, except require that they hold a Bachelor’s degree. Beyond that, Kepler hires with a lens on specific traits of potential course facilitators rather than aiming to match degrees with areas of teaching. In particular, Kepler conducts group interviews with prospective course facilitators by conducting a series of exercises that focus on an ability to take feedback, flexibility, and the willingness to see the act of teaching as one of a coach, rather than a “sage” that knows all. Additionally, Kepler focuses deeply on a prospective course facilitator’s ability to read, write, and speak in English. Ultimately, this has resulted in Kepler course facilitators coming from a variety of backgrounds, including computer science, accounting, education, and health sciences. For Kepler, who requests that course facilitators teach around a variety of topics (and gives scripted lesson plans to do so), the qualifications or area of study for a candidate is much less important than their willingness to be innovative and flexible in a non-traditional educational program. Course facilitators all hold a minimum of a Bachelor’s degree, and some hold Master’s and Doctorate degrees. They are in
varied fields, and the course facilitators also hail from different academic and employment backgrounds. Once hired, all course facilitators go through rigorous training to gain the strategies needed to work as a facilitator rather than lecturer in class. Training, which is daily throughout the course of the first year and continues less intensively in subsequent years, also covers educational technology, understanding the CfA platform, specific strategies for academic and employment coaching, as well as setting and tracking goals as a course facilitator.

**Employment at Kepler**

The majority of Kepler employees are Rwandan. Of 25 course facilitators, 23 are Rwandan. Kepler also hires several of its most talented students as teaching assistants, and a few graduates are hired as course facilitators. The nurse and clinical psychologist are Rwandan, as is the majority of the operations team. Because Kepler pays course facilitators, for example, the same rate a PhD in Rwanda would earn at a local university, the competition for jobs there is stiff—there are usually around 500 applicants for each open course facilitator position.

This represents a significant shift from Kepler’s first year, where the majority of the teachers were expatriates. Academic administrators realized that while local teachers needed a significant amount of training, the investment would be worth it—local teachers will stay on for a long time unlike expatriates who leave after a few years. But a significant gap in Kepler management between expats and Rwandans still exists. All senior leaders are expatriates, although there are several Rwandan staff members that are moving up in senior academic positions, and the plan is to have the Kigali campus Rwandan run by 2017.
Chapter 5: DISCUSSION

This dissertation employed mixed methods in an evaluative case study to examine how innovation in university education can lead to the creation of a Black middle class in a developing country. Three central sources of data were used for the case study—quantitative data on Kepler test performance versus a matched control group, qualitative interview data, and ethnographic observations of the Kepler program.

Quantitative

The data in this study compared learning outcomes of students from Kepler and other Rwandan universities in Kigali. Several independent variables were analyzed based on a review of the literature on educational outcomes for various subgroups, on the Black middle class, on education in Rwanda, and on blended learning. For the quantitative portion of this study, these variables were groups into four major domains: gender, urbanicity, poverty, and age.

Gender

As outlined in chapter 2, while some Western countries are experiencing a gender gap in education where women are outperforming men in primary, secondary, and university education, this is not the case in Rwanda or sub-Saharan Africa. The literature shows the attendance and performance of women in school is directly related to an increase in a country’s growth, both politically and economically. My quantitative findings indicate that Kepler women will contribute to the growth of a Black middle class in Rwanda. In fact, because females outperformed the match control group attending traditional universities in Kigali in both typing and the April 2014 CLA+ selected questions Kepler students are gaining skills allowing them to perform at higher levels than their peers. This is especially important in relation to the literature demonstrating better educated
women contribute to the betterment of society by making more empowered decisions about reproductive health, safe sex choices, the education of their families, and choices in work (Agbemenu, Terry, Hannan, Kitutu, & Doswell, 2015; Behrman, 2015; Ulin, 1992; Watkins, Sello, Cluver, Kaplan, & Boyes, 2014). While Kepler males also outperformed their peers at a statistically significant level on both typing tests, they had the opposite pattern of statistically significant outperformance on the CLA+ selected questions test. Male Kepler students outperformed their peer group at a statistically significant level on the October 2013 administration of the test, but not on the April 2014 exam. That, over time, Kepler females outperformed their peers at a statistically significant level, when males did not, indicates that components of the Kepler program particularly serve the female population well.

This evidence is inconclusive given that the abovementioned trend was seen on only one test. It is furthermore complicated by IDinsight’s report that males and females made progress on all areas tested at the same rate. This would indicate that the curriculum is not biased towards men. The typical Kepler female student in the first cohort of the program, however, fits the typical profile discussed in the literature review and is a lower achiever than the typical male Kepler student. Females are not falling behind their male counterparts in terms of progress, but they are still performing at lower average scores than their male peers.

Overall, the quantitative analysis on test performance supports the finding that female students perform at lower academic levels than their male colleagues. Kepler students of both genders, however, were not outperformed by their peers on any of the tests. They scored at statistically significant better levels on their typing and the CLA+ selected response test. These results concur with previous findings and suggest that women have the potential to improve the civic and economic life of the entire society and that Kepler’s innovative program will contribute
to the development of a Black middle class. This analysis will be further explored in the qualitative interviews and ethnographic findings related to gender. The quantitative findings in relation to gender-based performance and the creation of a Black middle class could be further strengthened and explored by doing a longitudinal study on the performance of Kepler students against the match control group for performance, earnings, and life decisions after employment.

Urbanicity

The literature on urbanicity and academic achievement clearly shows that in Rwanda, sub-Saharan Africa, and world-wide a gap exists between the performance of urban and rural students in terms of enrollment, performance, and completion rates (Williams, 2005; Zhang, 2006). The findings in this study refute much of the literature regarding the underperformance of rural students. Compared with their rural peers attending traditional universities, Kepler students demonstrated higher levels of performance at statistically significant levels on over half of the tests administered, including the CLA+ selected response exam in both 2013 and 2014, the 2013 SLE, and both the 2013 and the 2014 typing test. This indicates that Kepler’s rural students are performing at significantly higher levels than their rural peers at traditional universities.

Kepler’s urban students outperformed their urban counterparts on only three exams—the October 2014 CLA+ test, the CLA+ 2014 selected questions, and the 2013 typing test. While Kepler’s urban students are certainly outperforming their urban peers, they are not doing so in as many academic areas tests as the rural students.

When comparing the mean scores of Kepler’s urban versus rural students, there is not a wide chasm found in any of the scores between urban and rural students similar to the findings of previous studies in sub-Saharan Africa (Kulpoo, 1998; Zhang, 2006). In fact, on two of the tests—the CLA+ selected response questions and the SLE exam—the average score of a Kepler rural student was slightly higher than the score of an urban student at a Rwandan traditional university.
These findings add to the literature discussed in chapter 2 on the debate of the origins of the gap between urban and rural students in developing countries. To recap, the debate posits individual and home factors versus schools and school locations as the root causes of the gap (Heyneman, 1976; Heyneman & Loxley, 1983; Riddell, 1989). This also contributes to the findings that even when rural students attend the same schools as their urban counterparts that they tend to lag in student achievement. The Kepler model offers methods that are conducive to bolstering rural student achievement. The literature suggests that because children living in rural areas tend to enroll in schools with fewer resources, rural student are often subjected to double jeopardy in their achievement and learning opportunities (Zhang, 2006). In the case of Kepler, the results demonstrate that regardless of urban or rural background rural students can achieve results equal to urban students. If Kepler’s model is able to address this achievement gap, there is potential for rural students to contribute to the development of a Black middle class.

**Poverty**

As outlined in chapter 2, there is significant body of research confirming poverty is correlated with several negative outcomes in the academic life of a student. These complications include reduced rate of school enrollment, lowered retention rates, discipline problems, mental and physical health complications, and overall lower rates of academic achievement.

The findings in this dissertation both support and refute components of this literature. The studies on poverty and educational outcomes are supported by the three statistically significant differences in performance in the findings of the poverty subgroups on the tests: 1) very poor versus the poorest on the April 2014 CLA+ Performance Task, 2) very poor versus extremely poor on the April 2014 CLA+ Performance Task, and 3) very poor versus extremely poor on the 2014 CLA+ Selected Response Questions. In each of these instances, poorer students were outperformed by the subgroup with more resources. These instances corroborate the studies
discussed in the chapter 2 that outline the negative impact poverty has on educational outcomes. Despite these findings, however, there are other data points to consider that also challenge studies on the negative impact of low socioeconomic status (SES) on educational achievement. First, while there are the abovementioned three instances of an underperformance of students with a low SES, the exams yielded no statistically significant difference based on poverty.

Additionally, for its first cohort, Kepler only accepted the poorest students to align with the university’s vision of serving Rwanda’s neediest students. Therefore, while there are still different gradients of poverty, all students are poor. Because the data set only included a match control group and Kepler’s first cohort of students included only the poorest, there is not an inclusion of Rwanda’s wealthiest students. Clearly, this would be an interesting area of exploration for future studies, where a comparison of the poorest students at Kepler to the wealthiest students attending traditional universities would yield a rich data set to further explore the impact of poverty on educational outcomes when considering the development of a Black middle class in Rwanda.

Age

As discussed in chapter 2, there is a dearth of studies on age and its relationship with university success in developing countries. A body of research in Western countries, however, suggests that a student’s age influences performance. This research was mostly conducted in the United States and Australia and shows that older students will generally earn higher grades than younger students (Didia & Hasnat, 1998).

This study finds that age matters in performance, but given the low frequency of statistically significant findings, it is difficult to fully determine the extent that age matters in relation to academic performance in the Rwandan context and specifically at Kepler. There was only one instance of a statistically significant difference which was on the April 2014 administration of the SLE, where the oldest quartile of students (ages 23.1 to 26.3) outperformed
the youngest quartile of students (18.5 to 20.5). While this supports findings in the United States and Australia, which show that for every year increase in a university student’s age, there is an increase by about two to four percentage points (Borg, Mason, & Shapiro, 1989) because there was a difference in test scores according to age only once, there is also the possibility that the difference is a statistical fluke. On the whole, my findings show that age may be less important in the Rwandan context in relation to academic performance than is found in Western universities. Further longitudinal studies at Kepler would offer a richer data set to better understand the relationship between age, academic achievement, and the formation of a Black middle class in a developing country.

Qualitative Findings: Interviews
This section builds upon the qualitative findings discussed in the previous section through an exploration of student interview responses regarding experiences at Kepler. I explored Kepler experiences through three central questions—what makes Kepler different than other universities, how did students hear about Kepler, and what do students think Kepler needs to improve. Responses are organized into three different areas: gender, urbanicity, and levels of academic preparation.

Gender
The challenges women face in education in sub-Saharan Africa were outlined in chapter 2 and further analyzed in the quantitative analysis in section 5.1. In essence, the education of women is directly correlated with the civic and economic improvement of a developing country. As the quantitative findings related to gender demonstrate, there are several areas where Kepler females are showing high levels of performance.

In addition to the struggles female students experience in developing countries, the literature on the Black middle class shows how innovations in higher education contribute to the
formation of a Black middle class. The importance of Black social networks, including those in schools, and in religious, professional, social, and educational institutions, have been central to the growth of the Black economic class in the United States (Haynes, 2005). And, while there has not been much research conducted on the Black middle class in developing nations—except for economies growing much faster than Rwanda’s—the subject remains important to developing nations (Chapman & Austin, 2002; Kharas, 2010). Last, while blended learning is newer to the Rwandan context, an extensive body of literature documents the models and potential of blended learning to address student, faculty, institutional, city, and country needs, including inadequate classroom space, limited access to content expertise, needs for collaboration, and space for innovation (Garrison & Kanuka, 2004).

Analyzing interview responses through the lens of gender supports the majority of the research on gender and educational attainment, the Black middle class, and blended learning. Female students noted levels of stress regarding their schedules and reported struggling more at the beginning of their programs, most likely due to lower levels of preparation, which are documented in the literature review.

Both females and males cited the importance of Kepler providing a living stipend, housing, and healthcare, but males still noted technology as being the single most important component that distinguishes the Kepler program from others; females found the living and living stipend to be the most distinguishing factor of Kepler. This supports literature documenting the expectations of women in the household (Garrison & Kanuka, 2004) in developing countries. Providing housing, a living, and healthcare is likely to have a larger impact and influence on the experiences of females than males given the gendered stitching of female social expectations in the fabric of Rwandan
society. In essence, removing those pressures from a female student’s life allows her more time and space to focus on her studies.

The qualitative findings in relation to gender also support literature documenting the importance of social networks in the formation of a Black middle class (Kharas, 2010). Both male and female respondents reported the primary means of learning about Kepler was through social networks. From a gender perspective, some female respondents did not know the programs of study available at Kepler but instead just focused on the scholarship. Additionally, male respondents were more likely to be informed about the Kepler project by their networks because they were directly told they were students, whereas females reported a more general experience about receiving information about the program, while not necessarily being encouraged to apply. This indicates that male education is considered more important than women’s education and men considered more capable than women (Chapman & Austin, 2002).

When asked how Kepler could improve and what makes Kepler different, respondents mostly verified the findings in the literature on blended learning. Kepler can use blended learning to address the many challenges documented in the literature on education in the developing world. The blended learning model was developed to address a lack of seats for enrollment, resources, and higher quality programs. In particular, female students note they are able to be successful due to high levels of attention to their work and progress, high expectations, and effective use of technology.

The most frequent area of improvement noted by both males and females, however, was the hiring of content-area experts. The Kepler model originally intended on using MOOCs taught by world-class professors to import high-quality content and course facilitators to assist students in digesting and applying the content. Yet student input suggests a need for on-the-ground experts
challenges the idea that in a blended learning context on-line content can substitute for a lack of access to high quality content.

**Urbanicity**

The literature on urbanicity illustrates a large gap between the performance of urban and rural students world-wide. The quantitative section of this case study demonstrated that the prevailing trend in rural underperformance did not necessarily hold true in the case of Kepler.

When interviewed about their experiences at Kepler, urban and rural students expressed similar sentiments about what distinguishes Kepler from other universities, how they found out about Kepler, and what they felt Kepler needed to improve. The literature outlining the challenges of education in the developing world is supported by Kepler’s urban and rural respondents, with both groups noting that Kepler provides several structures unavailable in other universities, including academic support structures, individualized attention, and, especially, earning a degree from the United States through a program utilizing a high level of technology. These structures highlight the potential for technology and blended learning to overcome many of the challenges facing rural students around the world.

The support systems offered by Kepler, as well as the respondents’ discussions of the living stipend, housing, and health supports offered by Kepler may explain the lack of a large gap in urban and rural performance often found in other institutions. When students are provided with and understand the supports provided them, there is a noticeable reduction in the traditional urban and rural achievement gap. Because of the findings in this study, an area ripe for future research would be to continue to explore institutions that provide supports that give students a middle-class lifestyle such as Kepler to determine if the urban versus rural achievement gap is reduced in similar settings.
Kepler’s urban respondents particularly noted the assistance they receive in their professional competencies class, which led them to understand how to work in teams, build a résumé, handle conflicts, and stand out in comparison to their peers with employers. The professional competencies courses at Kepler directly address some of the unwritten, “rules of the middle class” that dictate professional behavior. Urban students noted, as we find in the literature, that even once in the middle class, life for Blacks is not discrimination free—whether for race, class, or in Rwanda, ethnic reasons.

Similar to the findings discussed in the gender section, the importance of social networks (Karahas, 2010) was reflected in the interviews of urban and rural students alike. All except three rural and three urban students mentioned they heard about Kepler through their social networks, further supporting research that the creation of a Black middle class both in the United States and in developing countries is heavily reliant on social networks.

The literature on rural student access to fewer resources than their urban counterparts (Foster, 1977) was supported by comparing the two respondents. Rural students described less familiarity with technology when arriving at Kepler than their urban counterparts, and therefore, more frustration with problems using the Internet, which when combined with high expectations in the ability to complete on-line work caused stress. But students felt they received individualized support and could outperform their peers at local universities, indicating that although high levels of technology can be stressful at first for rural students in particular, using well-founded blended learning principles and ensuring students and teachers effective support in blended learning (Garrison & Kanuka, 2004) can close the urban-rural achievement gap.

Similarly, the disdain for having their stipends deducted as a disciplinary measure supported the research that rural students come to school with fewer resource. Specifically,
students noted that loss of stipends used to support families resulted in higher levels of stress and a perception of lower academic performance. Rural families in Rwanda struggle more deeply with food provision and other family member support. Thus stipend deductions likely affect rural students more profoundly than their urban counterparts.

The literature about blended learning as a means to deliver high-quality content was also challenged by both urban and rural respondents, who both felt that the most important improvement Kepler could make would be to hire course facilitators with content expertise. This mirrored the findings in the gender findings of this chapter.

Urban students offered a higher number and more varied suggestions about how Kepler could improve the program. This supports suppositions in the literature that urban students come with more resources (Mazimpaka & Daniel, 2000; Kharas, 2010). They desire better communications with administrators, more accurate information about the program, the inclusion of students in programmatic decision making processes, and accurate information about the state of the program, especially policy changes.

**Academic Performance**

Academic performance was analyzed to understand how different levels of performance influence the perception of Kepler program quality. This analysis was performed with a particular interest in understanding how high and low performers experience an innovative and blended learning program designed to move students into the middle class. High academic performers earn grades in the top 50% of their class at the end of their first term, and low academic performers earn grades placing them in the lower 50% of the class.

The importance of research on developing blended learning models that don’t simply focus
on technology was confirmed by respondents who were both low and high academic performers. Both groups noted the academic model of the ubiquitous use of technology and the requirement to work in groups and participate in class is drastically different than anything they engaged in earlier in their academic careers. Both groups noted experiencing significant struggles when starting at Kepler, and it’s not surprising that those performing at lower levels expressed the highest levels of frustration. Low performers, however, were able to describe the structures and systems in place to assist them when they were struggling and noted what allowed them to continue in the program. The support systems and structures included both on-line and off-line resources including on-line tutoring, in-person office hours, study halls, and study groups organized according to their housing assignments. The structures they can access demonstrates the importance of blended learning literature outlining the importance of well-designed programs (Allen & Seaman, 2011).

Additionally, the case studies on blended learning showcasing the need to design a program specifically formatted to the goals of the institution were confirmed by the focus on internships as a differentiating factor at Kepler. High performers focused on both the structure and availability of internships at Kepler in their first and second years compared to other universities, which have internships only in their last years or after graduation. Since Kepler has modified the learning model in timing and content and aims to move students out of poverty, student support of the internship model and the fact that 80% of Kepler students are employed before graduating supports the research that blended learning cannot be simply dictated by the terms of technology but rather must be mapped to the specific goals of the program.

Similarly, research demonstrating clear and focused blended learning design was supported by the responses of low academic performers that expressed frustrations about program design, including a desire for more programs of study, clarity on rules and consequences, a need for more
improved communication, a feeling of being overloaded by class schedule, structure, and program in general. This suggests that while the Kepler program includes sufficient supports for when students are struggling, that the design could be improved by assisting students that are struggling more intensively at the beginning of the program with more structured interventions.

Lastly, both high and low academic performers confirmed findings on the importance of social networks in the creation of a Black middle class (Hine, 2003). Respondents in both groups noted when they struggled in the program—whether academically, culturally, or socially—they reached out to networks of support formed in their student housing groups. In equal proportions, high and low academic performers noted that the social networks formed in their classes, and especially in their houses, enabled them to find success in the program.

**Ethnography**

This section includes an analysis of the ethnographic observations and will consider the following topics in relation to how innovations in university education lead to the formation of a Black middle class in a developing country: 1) recruiting and admissions, 2) student housing, 3) the nexus between Kepler and employers, 4) provision of monetary and non-academic services, and 5) observations of Kepler and other universities. While all of these topics will be explored in the context of the literature review, particular attention will be paid to the literature on education in the developing world, the Black middle class, and blended learning. These areas of focus connect the innovations in Kepler’s program from a blended learning perspective directly to class factors that may have been less explored in the qualitative interview and quantitative sections.
Admissions

As described in my ethnographic findings, Kepler purposefully designs its admissions process to ensure gender equity, as well as to ensure there is equal representation of urban and rural students, while also seeking out both the brightest and poorest students in the country.

When considering the Kepler admissions process in the context of the development of the Black middle class in the United States, which offers a comparison of what Black middle class development may look like, it becomes clear that Kepler’s approach to admissions falls along clear ideological lines in light of the Booker T. Washington versus W.E.B DuBois debate on education for the advancement of Blacks (Landry & Marsh, 2011). Kepler, with its approach in *creaming*—or choosing only a small group of the most highly educated Blacks for admissions to Kepler—mirrors DuBois’s discussion of the “talented tenth” in the *Philadelphia Negro*, (1967 [1899]). As discussed in the ethnographic findings section and further explored in this chapter, in the context of this debate, it is worth noting that of Kepler’s 25 course facilitators, all 25 are Black, and 22 are from Rwanda, which further mirrors DuBois’s earlier intellectual positions in which he argued that there should be more Black university-educated teachers so that Black students would have Black teachers. DuBois may have supported Kepler’s teacher model, but he would have been less pleased with Kepler’s management structure, in which all head managers are White (while noting two Rwandan staff are being trained up to lead the Kigali campus in 2017). Kepler’s admissions approach is, of course, at odds with Booker T. Washington’s approach, which advocated less for a small, Black elite group to move Blacks forward and instead supported vocational training for the advancement of Blacks.

In many ways, Kepler’s approach offers a modern day consideration of DuBois and Washington’s arguments in the context of a developing country. Through the literature on this classic debate, it is clear that Kepler’s admissions process both perpetuates and alleviates
inequality. On one hand, Kepler seeks to admit an equal number of men and women, aims to serve the country’s poorest students, and looks to ensure there are equal numbers of students from urban and rural areas. On the other, by choosing only the highest performing students per year out of 7,000 applicants, Kepler clearly perpetuates inequality by creating a new elite, small group that’s able to earn a Bachelor’s degree from the United States and receive a suite of services that are unavailable at other local institutions. Those of the mind of Washington would likely cite that the concentrated amount of resources poured into a small group of students may be better spent serving a larger group of students in vocational or broader educational programs to improve the overall status of a developing Black middle class in Rwanda.

Kepler’s innovative model works to include marginalized groups in its efforts to build a middle class. Its admissions process illustrates the conundrum that innovative university programs in developing countries ultimately face. The admissions process—in its efforts and desires to build a Black middle class—will simultaneously alleviate inequality by serving its students and perpetuate inequality for all those it does not serve.

Kepler’s admissions process and its goals to serve students that aren’t served in Rwanda (the poorest students, women, and rural students) means the design of its blended learning program is particularly important in ensuring these traditionally underserved groups are able to find success within the Kepler model. Kepler’s model addresses many of the challenges faced in Rwanda and developed countries, including limited university seats, a lack of content expertise, and a need for innovation (Allen & Seaman, 2011). The findings in the qualitative interviews demonstrate that, on the whole, the Kepler program design supports blended learning as most successful when aligned with an institution of higher learning’s goals. It can be transformative when the program is designed to meet the needs of students (Moskal et al., 2013). While the outcomes demonstrate
that the program ensures the poor, rural, and female students can succeed in the program, the program can continue to be modified to improve student success.

Student Housing

As noted in the ethnographic findings section, the housing component of the Kepler program plays a large part in both the academic and social life of Kepler students. Affiliations such as those created in the housing structures at Kepler not only assist in economic growth, but also serve other needs including those specific to women, health care, and the general navigation of social struggles, including instances of exclusion when moving from one class to another (Hayes, 2003). Based on observations of housing at Kepler and student interviews, the housing structure at Kepler provides social capital that the literature on the Black middle class in the United States discusses.

In relation to the context of the literature on the Black middle class in developing countries and the state of education in Rwanda, housing fulfills the basic needs that are often missing in the lives of students in low-income countries, particularly for female, poor, and rural students (Lassibille & Tan, 2005). Provision of housing not only gives the social support students need in a demanding academic program, but it also enables students to fulfill their basic needs, enabling them to focus more on learning. Especially in the context of a developing country, student housing is an important component in building an innovative university program that contributes to the growth of the middle class in Rwanda.

The literatures on blended learning shows that while housing appears to be ancillary to the blended learning components of the program, it is designed to encourage technological learning and student diversity. Additionally, Kepler’s assignment of study groups and use of a flipped model—where content is consumed outside of classes/in the houses and then digested in the classes—demonstrate that program construction in and outside of the campus assists in the creation
of a Black middle class. Outside of the academic demands that are placed on Kepler students, housing teaches students to manage group budgets, solve conflict, and work together as a group.

Additionally, the preliminary ethnographic findings from Kepler’s second campus in Kiziba refugee camp—where students already receive housing from UNHCR and all live in their community of study—also supports the literature on the importance of social networks as a means to building the Black middle class. Feedback from the Kiziba campus overwhelmingly has included a student perspective that solving problems is much more difficult when students don’t live together, that completing difficult homework assignments poses a challenge, and overall students report feels more disconnected from the program than on the Kigali campus where students are living together.

Finally, Kepler has likely deviated from its first cohort philosophy of serving students that are Rwanda’s poorest. On one hand, including students from various economic background exposes students from different economic backgrounds and enables Kepler to avoid a reputation of serving only, “poor students.” On the other hand, if Kepler aims to build a middle class by serving those that would not have access to university education, the addition of students that may have access to university education and pathways to the middle class may subvert some of its goals. A further longitudinal study of the perspectives of students in the program, economic outcomes of students, and perspectives of employers, managers, and teachers will be helpful in understanding the effects of creating more economically diverse classes at Kepler.

The Nexus Between Kepler and Employers

As noted in the findings section, Kepler creates several structures to ensure students have access to internships and jobs, including networking for students, designing classes and curriculum around student internships and work, and collecting feedback from employers to help students at work and ensuring forward movement once they earn a position.
Kepler’s approach to securing student jobs echoes experiences described in the literature on the U.S. Black middle class. It notes that the movement into the Black middle class is often fraught with emotional stress and experiences that may be different than those of other middle class citizens, including the educational downward mobility of their children, lower marriage/cohabitation rates that decrease household incomes, and unequal pay (Pattillo-McCoy, 1999; Grodsky & Pager, 2001; Loury, 2002; Battle et al., 2006). Kepler’s design to move students into internships and jobs that move them into the Black middle class aims to consider and circumnavigate the challenges that have been noted in the Black middle class in the United States. In analyzing the experiences of the employers and students in getting internships that then turn into employment, it is clear that direct interventions that play the role of a “middle-class parent,” i.e., advocating for students, networking for students, staying abreast of the latest opportunities for students, and working behind the scenes to resolve problems when they arise for employees is an important part of ensuring students can both move into and stay in the middle class. Kepler, as an institution, is playing the role that a middle- to upper-class network would in the life of a young university student. While the program is still in its earliest stages, there is an indication that directly understanding the perils of the Black middle class in the United States and aiming to address those in an innovative program designed to contribute to a Black middle class is paramount to either avoiding or at least minimizing some of the perils found in being a member of the American Black middle class.

Kepler addresses some of the central educational challenges in the developing world and Rwanda. First, there is a rapid increase in demand for university education that is simultaneously clashing with rapidly changing and sometimes unstable political environments, entrenched international aid systems, resistance to organizational change, and immense financial constraints
(Burbles & Callister, 2000). Therefore, because of the challenges that education faces, most students that can afford to attend university outside of their home country will choose to leave. This “brain drain” hampers the economic growth of many developing countries such as Rwanda, since most talented graduates often stay in the country they studied in, meaning they do not contribute to the economic advancement of their homeland (Pang et al., 2002). As noted in the findings chapter, Kepler’s focus on the nexus between the institution, employment, and their admissions policy addresses some of these challenges directly. First, Kepler seeks to find bright students that would not normally have access to an American degree by focusing on the country’s extremely bright but also very poor students and engages them in a program that not only aims to deliver a higher quality education that local institutions but also ensures that students have access to and are coached through employment opportunities. This addresses the phenomenon of brain drain by educating some of the country’s brightest students. Given that they are not a part of the economic elite, without connections to employers, students might not become contributors to the growing economy. By bringing the degree from the United States, placing it directly in the country of residence, selecting students that are bright but poor, and providing them economic opportunities within their home countries, Kepler enables students to transform their own economic lives the country’s economy as a whole.

Specific to the literature on higher education in the Rwandan context, a need to increase skills gained in higher education and better job preparation exists (Williams, Abbott, & Mupenzi, 2015). Kepler’s program has shifted significantly since inception to accommodate students’ ability to work, the school’s educational program, and the needs of employers. To determine if this purpose is served over the professional career of a student, longitudinal studies on the satisfaction of employers and students in their careers would offer further insight into Kepler’s ability to create
a successful nexus between students and employers, as well as to create an innovative university model that contributes to the creation of a Black middle class.

In terms of the literature on blended learning in relationship to Kepler’s model, there are several documented case studies about blended learning models for adults that are already working or to develop skills to assist students who wanted to be successful in the workplace (Bonk & Graham, 2006). There is limited documentation, however, about creating a blended model that begins with students that are not working and seeks to place them in employment (within a non-vocational program). Kepler’s goal of moving students into employment while in the program is not necessarily the first of its kind, but is unique compared to those outlined and studied in the literature on blended learning. Again, further longitudinal studies would be helpful. Kepler’s model is clearly aimed at introducing technology and changing pedagogy (Banerjee et al, 2007; Barrera-Ososiro & Linden, 2009).

The Provision of Monetary and Non-Academic Services

As outlined in the ethnographic findings section of chapter 4, Kepler offers a suite of services and support that are outside of the academic realm but are designed to remove the stressors of poverty and enable academic achievement. This includes a monthly living stipend intended to cover food, transportation, and other incidental costs. Additionally, there is an on-site clinical psychologist and nurse to assist with student mental and physical health needs. Lunch is provided to students, as well as a range of wellness services including hygiene education, sports teams, exercise programs, and nutritional awareness campaigns.

Similar to the housing program, the services are aimed to alleviate the perils found in the Black middle class in the United States, where researchers have shown that Blacks in the middle class do not enjoy the same levels of security as their non-Black peers in the areas of housing, pay, healthcare, and the educational mobility of their children (Battle et al., 2006). Provision of health
care, counseling, health education and programs, and a living give access to the kinds of services and funding they would automatically have, if they were a part of the middle class. Rather than simply accepting that Kepler students are poor and therefore lack access to the same resources as middle- and upper-class students, Kepler aims to build those supports into the program, which it hopes will lead to higher academic achievement, greater performance in jobs, and the ability to navigate academic and social life without the stress that can interfere with the university education of poor students.

The literature on blended learning programs focuses on how blended learning can solve several problems, including those of cost (Dziuban et al., 2004). On the flipside, however, the perils of joining the Black middle class have demonstrated that spending is necessary to provide the support with which students would automatically enter university, if they were a part of the middle class. In a developing country, while some costs can be saved in a blended model, the savings may simply need to be directed to non-academic services that ensure students can be successful in a rigorous academic program.

Observations of Kepler and Other Universities

Observations of Kepler point to differences between Kepler’s model and those normally found in Rwandan institutions of higher education. These include higher levels of rigor and greater expectations, intensive use of technology, and accountability in terms of timeliness and academic honesty.

Kepler often notes that it designed its rigorous program to not only ensure that students receive a high-quality education, but also to ensure a Kepler student is able to adequately model the behaviors of the American middle class, including timeliness, professionalism, seizing the initiative, critical thinking, teamwork, and other hard and soft skills. In explicitly teaching these skills to Kepler’s first cohort, the program aimed to determine if these skills would assist students
in navigating the difficulties the Black middle class faces as outlined in the literature in the United States, including restricted residential and educational choices, discrimination while shopping, and the ability to advance forward according to skill sets in their careers (Cose, 1993). Preliminary discussions with students and employers, and employment outcomes indicate that these explicitly taught skills may help Kepler students moving into the Black middle class in a developing country and help them navigate these difficulties, although further longitudinal studies would need to be conducted to confirm these initial observations.

Kepler’s model, which deviates drastically from local models and includes higher levels of rigor, intensive technology use, the explicit instruction of content-level and “soft” professional skills, supports the literature’s findings that graduates better prepared for employment in Rwanda are greatly needed (Mbabazi, Dahlgren, & Fejes, 2012). As 80% of Kepler student internships turned into full time employment even before the students graduated, the skills that students are exhibiting once engaging in Kepler’s model lead to high employment rates for students. Additionally, the literature outlines the challenges Rwanda’s higher education system faces in multiple areas, including instructor quality, relevance of student skills, emphasis on theory over practicality, struggles in language instruction, and a lack of funds (Andersson et al., 2013). Based on quantitative, qualitative, and ethnographic observations, Kepler’s model addresses higher education’s challenges by training instructors, teaching and evaluating students to ensure they have the skills needed for the workplace, minimizing the use of lectures and ensuring students engage in assignments and projects that engage them on the practical rather than theoretical level, providing intensive English language support in the areas of speaking, writing, and listening, and securing funding from foundations and private donors that ensure students have access to technology, non-academic support services, and high quality instruction. While Kepler’s model
has undergone curricular and programmatic changes since its inception, indicating that improvement has been possible in institutional design, comparisons with other local institutions indicate that providing instructional, non-academic, and school-to-work resources contribute to the growth of a Black middle class in a developing country.

Comparing Kepler’s adoption of blended learning to other local universities demonstrates the stark contrast between paper and pen and blended learning models in institutions of higher learning. At the timing of writing, no other universities in Rwanda had adopted blended learning. In fact, all other universities—whether foreign or Rwandan—did not use technology in classes outside of projectors and microphones. The use of computers in universities was limited to computer labs with often outdated equipment and Internet connections that worked roughly half of the time. Kepler’s use of technology was greatly ahead of the local universities, and the idea of using on-line and in-person learning was not entertained at other institutions. Kepler’s use of technology was not perfect. Faulty Internet connections, computers with limited battery power and capacity, frequent electricity shortages, the need to run the campus on a generator, exorbitant Internet costs, and high import taxes on hardware and software purchases certainly posed significant challenges in the implementation of Kepler’s blended learning model. These ethnographic findings, when cross referenced with the qualitative interview responses demonstrate that while Kepler’s blended learning model may be more technologically and pedagogically advanced than local models, challenges inhibited the model from being implemented at an optimal level, and it may be far off from international standards in institutions of higher learning with more technologically, electrically, and financially stable environments.

**Theoretical Connections**

A framework integrating the ideas of economic theories and schooling were used to situate this study in the existing literature on university education and class. This current study confirms
the importance of the theories of Marx, Bourdieu, Anyon, Bowles and Gintis, and Apple. From the feminist perspective, it especially confirms the theories of inclusive pedagogy outlined by bell hooks.

Schools and Economic Theory

Marxist theory connects school to the creation of class, and Marx articulated a creation of social classes in relation to struggles between the bourgeoisie that own the means of production and proletarians who sell their labor (Marx & Engels, 1970; Bowles & Gintis, 1976; Giroux, 1983). Building upon Marx’s theory, Apple and Jungck (1990) theorized that institutions of education often serve to replicate social classes and individual economic roles in society.

Kepler’s model directly acknowledges and aims to wrestle with the role that schools have in replicating economic standing in society through both its admissions, academic program model, and nexus between the institution and employers. Student responses to the model and employer engagement with Kepler students demonstrates that its approach to education that educational institutions can serve to replicate one’s social class in society. Kepler recognizes that in taking in the poorest students in Rwanda, specific supports must be built into the model outside of pure learning to ensure that class mobility occurs, including teaching middle-class behaviors, providing living arrangements and support for poor students to navigate the world as if they had the resources of middle-class Rwandans, and providing direct communication, advocacy, and support with employers. If Kepler simply focused on its learning outcomes, it is likely that students would still outperform their peers attending local universities, but interviews and observations demonstrate that to avoid merely taking in poor students and churning out still poor students, direct academic and non-academic interventions are essential. My findings indicate that an innovative school model that wishes to move study from one class to another to while working with poor students must provide carefully crafted interventions that directly address class disparities.
This relationship, however, isn’t always clear-cut, nor is it devoid of gray areas when considering theories of class and schooling. Engaging with Bowles and Gintis’s (1976) “correspondence theory” enables an examination of Kepler that encourages an understanding of the ways that the institution both does and does not meet the needs of students when aiming to create an innovative university model that enables the creation of a Black middle class in Rwanda. On one hand, Kepler still functions under a school hierarchy where “workers” are being prepared. There are Western, White managers that determine the curriculum, administer student sanctions, and train Black teachers to prepare students for the workplace. One hand, the race and class of management and their actions supports the theory that Kepler is simply an institution aiming to produce students that can work, and work according to rules of the Western, largely White, middle class. On the other hand, Kepler hopes that students can be the most stellar entry level employees at local and international companies, works directly with employers to support student job advancement, and creates curriculums that directly address employers’ needs for Rwandan employees at a higher skill level than the average worker. Kepler also creates courses and supports students in entrepreneurial engagements, encouraging students to explore opening their own businesses.

Similarly, schools can be considered as places that normalize the ruling class’s cultural habits (Gramsci, 1971). Kepler both supports and challenges the economic theories of schooling and class. On one hand, its curriculum teaches students the hidden keys needed to open doors to the middle class. At its highest levels of management, Kepler also works with employers to advocate for its students, as would middle- to upper-class parents. It acts as a network or elite social institution. In these ways, Kepler aims to overcome the economic cycle of poverty students face—and students note Kepler’s effectiveness, citing their confidence, use of technology, and
ability to navigate socially and professionally a middle-class environment. Simultaneously, this very curriculum and approach could be interpreted as normalizing the rules of the ruling class—while there is certainly an emphasis on critical thinking and questioning in the curriculum, student responses and the ethnographic observations do not find instances that challenge the reasons that there is a ruling class, nor who they are, why they are in power, and what that might mean for Rwandan society. In the cases of correspondence theory and ideological hegemony, Kepler’s aims to build an innovative university model that contributes to the creation of a Black middle class that directly challenges schooling as merely replicating economic and social class and normalizes and accepts the behaviors and notion of a ruling economic and social group.

From a Marxist theoretical lens, Jean Anyon directly addresses and builds upon the connections found between the abovementioned economic theorists and schools. In her research, conducted mostly in the United States, she was critical of the common practice of blaming educators for the economic failures of schools and society. She rejected schools as the central location of economic failure and advocated for new school policies as a part of economic reform, including adequate wages, job training, and access to jobs. Kepler addresses and ignores some of Anyon’s theoretical approaches. On one hand, the quantitative and qualitative findings demonstrate that while there is certainly room for improvement in Kepler’s model, Kepler sees itself as an institution that designs and accepts responsibility for the broader connection of poor students to the larger political economy they enter upon graduation. On the other hand, even though it is well documented that Kepler does not have adequate wages for several of its workers and that the minimum wage has not been increased since the 1970s while the cost of living in Kigali and other urban areas is soaring (World Bank, 2013), Kepler has not veered outside of the direct school
environment to address the design of Rwandan society. The political and economic environment, as described and understood by Anyon, is therefore left largely untouched by Kepler.

Beyond economic theory and schooling, I consider the multiple forms of capital as described in Bourdieu’s “The Forms of Capital” (1986) as well as the power of language in the theories delineated in *Language and Symbolic Power* (1991). Cultural capital refers to the advantages, knowledge, and schooling that one possesses to access different classes and status positions in society. Bourdieu argues that while some of this can be gained from school, it is primarily learned from family life. Kepler’s direct focus on teaching the skills that would normally come from family life—how to hold a fork and knife at dinner, how to introduce oneself, how to discuss content knowledge from one’s course of study—supports the theories of Bourdieu. In fact, Kepler has directly realized that it must teach the skills to its lower income students that those from wealthier backgrounds have already acquired. This is mostly done through work study, internships, job placement, and studies in professional competencies. Student responses to professional competencies, including responses that directly link the ability to perform in the workplace to the “hidden” skills taught in the class, demonstrate the importance of providing low-income students with cultural capital. Without this capital, even with a quality education, students cannot thrive in job placement as the first cohort of Kepler has done.

The findings in this study also support Bourdieu’s theories of language, which is not simply a means of communication but also a mechanism of power. Students outperform their peers on language tests and report high levels of confidence because they can dominate with their English skills in the job market. Finally, the official shift to English in 2008 is yet another instance of language as an expression of power. In this context, Kepler students are empowered to move to a higher economic class because of their ability to access and practice English—the language of the
elite. While this benefits Kepler students in that it moves them to a higher economic class, it also perpetuates inequality by further disempowering those that speak the local Rwandan language only.

In addition, the progress of a developing nation is directly related to the education of women. bell hooks’s theories support the findings in this case study. She notes that marginalized voices are many times absent in education, especially women’s voices and those at the intersection of race, class, and gender, those less privileged. The specific interventions of the Kepler program regarding gender—direct advocacy and encouragement of self-advocacy for women and building confidence—support hooks’s notion that including and empowering women in an instructional model creates more equitable and diverse populations that are successful both in and beyond school.

Summary

The goal of this study was to explore the ways in which innovations in university education lead to the development of a Black middle class in a developing country. Findings indicate that at Kepler, students outperform their local university peers in tests on critical thinking, English, and technology skills. Additionally, students report high levels of skill development, confidence, an ability to use technology and navigate the unknown, and placement in high level jobs even before graduation.

Therefore, a number of findings are consistent with the existing literature on education and class, including the importance of ensuring the achievement of poor, female, and rural students. While Kepler students outperformed a matched control group on several subjects, what requires further study is the model’s ability to serve those groups that are often underserved or underperform in Rwanda and sub-Saharan Africa: female students, rural students, and poorer students. If Kepler, in its early stages, has learned a way to navigate these issues in the education
to employment pipeline, the model has huge potential for changing the life outcomes of poor students in developing countries. Additionally, the importance of the theoretical underpinnings of class and school, as well as feminist theories were supported by this study. Findings from this study will contribute to research on the connection between innovations in university education and the development of a Black middle class in a low-income country by providing insight into how technology and other interventions enable the poor, female, and rural students to move forward.
Chapter 6: CONCLUSION

This dissertation offers an analysis of how innovation in university education leads to the creation of a Black middle class in a developing country. The previous chapter discussed the findings of this study in relation to the literature and theoretical framework. This concluding chapter includes four sections. The introduction outlines a summary of the dissertation, methods, and central findings. Following is a discussion of the study’s limitations, the implications of the dissertation, and areas for future research.

Conclusion

I sought to explore the ways in which innovations in higher education lead to the creation of a Black middle class in a developing country. Education remains an increasingly important component of the development of a Black middle in developing nations, particularly at the tertiary level, where a sound education has the potential to give students access to jobs offering a significant movement from abject poverty. Education of women and rural students is particularly important for the development of a Black middle class (World Bank, 2013) and, therefore, these groups have been carefully considered in this dissertation.

International organizations have exhibited interest in improving the educational systems of developing countries, but they have often focused on primary education given the lack of access and problems at the basic levels of education (Kharas, 2010). Despite the challenges of providing primary and secondary school education in developing countries—including a shortage of teachers, lack of funding, limited infrastructure, and grave disparities between the achievement of boys and girls—there has recently been a shift in focus from development agencies and developing countries themselves on university education. On one hand, there is a recognition that to move a country from low-income to middle-income status, university education is an essential component. On the other, developing countries face particularly complicated situations in developing
university education, including a lack of funds and professors, inconsistent policies, renewed conflicts, and significant student skill gaps that result from under-resourced and under-skilled K-12 education.

While there is research on education in developing countries and on the Black middle class, little work has explored the link between innovation in higher education and the creation of a middle class in developing countries. Technology and globalization have affected the spheres of work and school effecting rapid change. Not surprisingly, universities function to both promote and undermine inequality. Because this problem is little studied in the developing world, this project explored how higher education functions in creating a middle-class citizenry by studying the Kepler model in Kigali, Rwanda. The study also offered a blueprint of how technology, education, and information work in tandem to alleviate or perpetuate inequalities.

A large body of educational research has examined the multiple factors contributing to economic growth in both economically advanced and emerging countries, including gender and educational attainment, urbanicity and academic achievement, poverty and educational attainment, age and educational attainment (Baliamoune-Lutz, 2007; Chisholm & Leyendecker, 2008; Douglas & Sulock, 1995; Engle & Black, 2008; Kimani, 2016; Levin, 2007; Lewin, 2009; Williams, 2005; World Bank, 2013; Zhang, 2006). Adding to this literature to understand the interplay between innovations in higher education and the development of a Black middle class are studies on the Black middle class, the Black middle class in the developing world, education in the developing world, and blended learning (Chapman & Austin, 2002; Kharas, 2010; Landry & Marsh, 2011; Lassibille & Tan, 2005; Picciano, 2014). This study sought to build upon this literature by understanding how innovations in university education lead to the creation of a Black middle class in Kigali, Rwanda and other developing countries.
This study used quantitative and qualitative data to describe Kepler as a case study. The quantitative analysis compared learning outcomes for Kepler and students at other Rwandan universities in Kigali. The quantitative study measured the performance of Kepler students and the control group on the Collegiate Learning Assessment (CLA+), Scholastic Level Examination (SLE), and a computer literacy test. This dissertation included a series of bivariate tests that were run to compare the performance of different groups relevant to the formation of the middle class. Variables included gender, urbanicity, poverty status, and age. In addition, students in the first cohort were asked a series of questions about their experiences with Kepler, including what makes Kepler different from other local universities, how they heard about Kepler, and what Kepler needs to improve. Ethnographic findings explored recruiting and admissions, student housing, the nexus between Kepler and employers, the provision of monetary and non-academic services, student poverty status, academic performance before entering Kepler, and observations of Kepler and other universities.

Many of the findings in this study challenged the literature, particularly in the performance of vulnerable groups in school. For example, gender findings demonstrated that while women scored lower than men, the results also showed that both men and women outperformed their counterparts. This indicates, given the gender equality in Kepler admissions, there is promise in the Kepler method of educating women.

The urbanicity findings in this dissertation challenge the findings in the literature, which overwhelmingly report that urban students outperform their rural counterparts. In the case of Kepler, it was found that urban and rural students in the program achieve at relatively similar levels, showing that Kepler can produce results with traditionally underperforming students, which is an important component of building a Black middle class.
Qualitative measures of the performance of Kepler students according to poverty status yielded results that both support and refute the literature reporting the vast majority of poor students perform at lower academic levels than their wealthier counterparts. In some areas of the academic test results, the findings in this dissertation supported the literature. In others there were no major differences in performance according to poverty status. These findings are, however, inconclusive given that Kepler only accepted poor students in its first cohort.

The quantitative findings in this study when measuring academic test performance according to age demonstrated there may be some indicators that being older supports a higher level of performance. However, this is inconclusive given the low frequency of these findings.

While the quantitative measurement of student performance on academic tests challenged several of the typical findings on student performance, the qualitative interview portion of this study often supported the findings of the literature review. So, while students may perform at levels that demonstrate they are capable of breaking trends of underperformance due to belonging to a vulnerable group, the nuances of the interviews revealed that vulnerable students often experienced higher levels of stress, as was found in comparing the experiences of females versus males. Females reported more difficulty with scheduling, meeting the rigorous academic demands of the program, and handling personal versus school duties. Similarly, rural students also described deeper struggles with navigating technology, English, and the demanding academic expectations of Kepler. Last, when examining the perspectives of students according to academic performance, those that were performing at lower levels reported higher levels of stress, more difficulties in navigating the technological components of the program, and deeper challenges with executive functioning skills in the demanding program.
Limitations

This study had nine specific limitations, which fall under three categories: 1) personal, 2) methodological, and 3) overall study issues. This section will identify and briefly describe each of the central limitations in this dissertation.

Personal

A central limitation in this dissertation is the possibility of researcher bias. Although I employed retroactive data analysis, given that I worked at Kepler and am the principal investigator, this study is susceptible to researcher bias. I aimed at the beginning of this dissertation to address this limitation by clearly delineating my role in using standpoint theory. The research limitation, however, is not solely the result of my professional role with Kepler but also because I am an American who will never fully understand or be immersed in Rwandan culture. Having lived in Rwanda for three years, I bring to this dissertation my personal experiences, which have been shaped by my interactions with Rwandan people and institutions.

Methodological

The first methodological limitation in this study is the sample size. There were only 50 students studied. Findings may not be generalizable but should be further tested and investigated using a larger sample size.

A second limitation is that the sample of students in the program was not randomized. IDinsight sought to control for the lack of randomness by comparing the students with a match control group that held constant for age, gender, poverty, and other important socioeconomic factors. Had participants been selected at random, the credibility of the statistical analysis would be higher. While Kepler has discussed randomizing admissions to conduct randomized control trials, the pool of qualified applicants has never reached the threshold where randomizing became a possibility.
Another methodological limitation is that only Kepler students were interviewed. No interviews were conducted with the match control group. Kepler students and the match control group were compared quantitatively but not qualitatively, thereby leaving the study without a full comparative analysis in both realms.

A significant methodological limitation of this research is a lack of a longitudinal analysis. Without it, academic outcomes, the ability to secure employment, salaries, job satisfaction, and attitudes about the program cannot be measured over time. This study, as designed, can only begin to uncover how innovations in university education can lead to the creation of a Black middle class, but it does not offer an analysis that can study the life outcomes of students after leaving the University.

**Overall Study**

The first overall limitation of this dissertation is that it takes place in only one country, Rwanda. It is therefore bound to the specific economic, political, and social realities of this tiny nation in the center of Africa. Because the study aims to create a blueprint for considering how to use innovations in university education to create a Black middle class, understanding these phenomena from the perspective of one country limits the findings. While much was learned from this dissertation, it is unsound to map the experience of one country to the rest of the developing world.

The second limitation is similar. Only one school was studied. Studying only one school means that the findings are limited to a certain set of students, as well as the curriculum, pedagogy, and overall school culture at Kepler. The ways in which the curriculum, admissions, student body, and outcomes of the students are reported in the case of Kepler may very well vary from those at other innovative institutions of higher education in Rwanda or other parts of the developing world.
The single point of contact for this dissertation is another limitation. Retroactive data analysis was performed from almost solely the student point of view. Data were not collected from employers, parents, government officials, community members, or the friends and family of students. The findings are therefore centered on the group experiencing the innovative university program, and data is lacking from those who can observe the students from the outside.

The final limitation of this study is that the dissertation addresses students without examining their ethnicity (Tutsi, Hutu, Twa, foreign student without a local ethnic identity). In part because of government mandates and to protect students, an analysis of how ethnicity, one of Rwanda’s largest sources of violence and social conflict, influences student outcomes and Kepler’s abilities to build innovative programs is lacking.

**Implications**

It is clear that as the youth population of Africa explodes governments, donors, and policy makers, both on the African continent and internationally, are concerned with how to educate and employ such large numbers of young people. In fact, Africa has the youngest population of any continent, with 200 million people between 15 and 24, and this number is expected to double by 2045. Most troubling is that less than 6% of this group has access to higher education, and currently over 30% are unemployed (World Bank, 2013).

Higher education that leads to employment as demonstrated by Kepler is one possible solution to this issue. Below, the central findings and implications of this dissertation are discussed.

**Gender**

One of the most significant findings of this dissertation is that female underachievement in sub-Saharan Africa can be challenged when academic program and support structures are carefully planned. While the quantitative portion of this dissertation certainly demonstrates that females experienced high levels of stress, periods of academic uncertainty, and still lag behind boys on the
achievement of some tests, there are also findings that demonstrate females can find success in a university setting. First, Kepler females outperformed their peers attending traditional universities. This finding is even more significant given that Kepler uses a form of affirmative action in its admissions process (accepting 50% females and 50% males by separating gender in the admissions process) while local universities accept roughly 30% females, and less than 10% graduate. This indicates that several components of the Kepler program are working for females in Kigali. Given that national development is directly correlated to the advancement of women, several policy making interventions should be considered when designing higher education programs to contribute to the creation of a black middle class.

First, ensuring females enter the higher education setting in numbers similar to their male counterparts is essential. Separating out gender in the admissions process (but still setting criteria that must be met by all applicants) ensures that females have a chance. Because men are favored in all aspects of life, including health care, schooling, and family roles, more men will be in tertiary education in the developing world. The Kepler model demonstrates that even though women come to higher education with lower levels of academic achievement their potential is just as high as men’s. More important, statistics show that their potential for developing themselves, their families, their communities, and their countries may be even higher than the men in the countries. The bottom line is that to move a developing country forward, there must be gender balanced admissions processes at institutions of higher education.

The admissions process is just the start, however. Once women are admitted, there must be specific interventions to ensure they succeed. Kepler empowers women to speak up in class, has created single-gender classes, researched the experiences of women and adapted program and curriculum accordingly, and created specific supports and interventions for women in health and
mental health care. Additionally, non-academic supports are particularly important for women and should be considered by any innovative university program. These include the provision of housing (thereby removing the responsibility of women to do household chores, care for the sick, and spend hours a day fetching water), a living stipend, and strict academic and housing expectations to keep their place at Kepler.

While non-academic provisions were important for Kepler females to find success, it is also important to note that the academic model itself—along with its high expectations—is also essential for the success of women. Females expressed high levels of stress at the beginning of the program, but they also performed at much higher levels than their peers at other universities, and made progress at the same rate as their male counterparts at Kepler. Additionally, several noted that while they felt overwhelmed, they also knew supports were in place to help them improve or address areas where they had not met academic or technological expectations: in short, a stringent program that demands much from female students but also develops a balanced understanding of female-specific challenges and supports enables high levels of success.

Urbanicity and Academic Achievement

The Kepler model narrows the traditional achievement gap between urban and rural students. Not only do Kepler rural students outperform their rural peers attending traditional universities, but they also perform at levels similar to their urban peers on several tests. This is not to say that the learning curve is the same for urban and rural students. The interview data demonstrate that rural students struggled more with technology, adjusting to Kigali’s urban environment, the rigors of the program, and coming from schools that likely had fewer resources. The Kepler model enables students to tackle these challenges and make rapid progress that gets them to performance levels on par with their peers.
The success of rural students at Kepler in many ways mirrors that of female students—Kepler uses an admissions process that aims to ensure there are roughly equivalent numbers of rural and urban students, and it goes out to rural areas, where students cannot afford to come to Kigali to apply for the program or take the Kepler admissions test. Admitted rural students are enrolled in a bridge program, live with students in housing where they can get support, and are pushed to high academic levels and supported socially and medically. Academic counseling, medical support, housing, and a living stipend program reduce the stress of poverty that low-income students face. While this does not solve all rural student problems, reducing the stress of meeting basic needs enables students to meet the demands of a rigorous and technologically sophisticated academic environment.

**Poverty Status, Age and Academic Achievement**

While most of the literature on poverty and academic achievement finds that the poorer a student is the more likely he or she is to struggle socially and academically, there was little variance among Kepler students at different levels of poverty. Qualitative interviews and ethnographic observations suggest that students have many needs met that they would otherwise worry about—housing, spending money, physical and mental health care, access to technology, supportive peer social networks, lessons in navigating multiple economic and social classes, and advocates for internships and employment.

While interviews and ethnographic observations clearly outline the assistance that enables poor students to succeed, only the three poorest categories of students were tested in this study. Comparing the performance of Kepler students to wealthier students in academic performance, completion rates, and in long term earning and career satisfaction would shed light on Kepler’s contribution to the creation of a Black middle class in Rwanda.
Findings regarding age and achievement indicate that they had little to no impact on the group of students examined. Expectations and knowledge about age differ in the Rwanda context (it is common for those born in and around the genocide not to know their age or birthdate) and interruptions in education were so common that age markers present in other parts of the world may be less relevant in Rwanda. A larger sample size might confirm these findings.

Overall Implications: Examining Innovation, Outcomes and the Black Middle Class

This dissertation is an evaluative case study examining how innovations in university education can contribute to the formation of a Black middle class. Does the Kepler model, as a specific case, contribute to the creation of a Black middle class?

Innovations at the academic level suggest the utility of a blended learning model, which was created through an iterative process that examined data to understand what works and what does not, followed the local cultural context, and did not shy away from major policy and curriculum overhauls until the model reached a level of stability. Kepler tried new approaches once it was clear something was not working (for example almost completely removing MOOCs from the program once it was clear they were not producing high quality learning results). Additionally, while the program may have changed significantly over the first few years, two components did not change: 1) high expectations, which were communicated to students and reinforced through a system of punishment and rewards, and 2) the use of technology even in an operationally challenging environment. While Kepler policies and curriculum changed, it also insisted on the use of technology and consistently demanded top-notch effort, performance, and rigorous learning from students. Teachers provided the support to root the program in technological innovation and academic excellence, strong educational elements that contribute to the creation of a Black middle class.
Socially, there were several indicators that the traditional underperformance of women and rural students were challenged by the Kepler model. Additionally, Kepler students outperformed their peers attending traditional universities on essentially every quantitative measure in this study, indicating that the Kepler model leads to superior academic performance. On the qualitative end and through ethnographic observations, a common finding was that Kepler students received the out-of-classroom support they needed to be able to thrive in the classroom, despite high levels of academic stress, a learning model students had never experienced, and frequent changes in the program. These supports included a living stipend, free tuition, access to software and hardware, counseling, health care, housing, and internship and career advocates. Cost, of course, is a constraint. In the case of Kepler there were and continue to be debates about the affordability of these services and their necessity. This study demonstrates a simple concept: if students are to achieve middle-class status, they need the resources of the middle class. While the model is certainly not perfect, it meets the evaluative case study standard of creating an innovative higher education model that contributes to the middle class. Kepler students, even those that the literature predicts would perform at a lower level, find success at Kepler. They graduate, develop a sense of confidence and ability to control life socially and economically, and find employment. When students are not worrying about where they will live, how they will pay their bills, how they will find a computer, and have someone advocate for them with employers as a middle- or upper-class parent would, they can focus on their studies and develop habits of mind outside the culture of poverty. Those habits include long-term planning, making clear decisions, and setting and tracking attainable goals. Therefore, Kepler’s magic “sauce” in creating an innovative model that leads to the creation of a Black middle class is equal parts its ever-evolving, innovative blended learning model and intensive out-of-classroom psychological and physical supports.
Future Research

This dissertation suggests several directions for future research. In fact, the limitations identified at the beginning of this chapter offer an excellent starting point from which further research can be launched.

Follow-up studies could be done by a researcher or group of researchers that are not personally connected with Kepler. A case study conducted by an individual or group of individuals, outsiders to the Kepler organization, would offer a different perspective and valuable insights in a Kepler case study.

Methodologically, future research might include a comparable case study with a larger sample size. With a larger numbers of students attending Kepler than when this study was conducted, future research, utilizing similar techniques, could examine program outcomes qualitatively and quantitatively. My findings could be further tested, investigated, analyzed, and validated with a larger sample size.

A validation or refutation of findings could be obtained by a randomized control case study. At the time of this study, the number of students that met Kepler criteria for admission was not large enough to randomize admissions, which would have enabled program testing on a group of equally qualified students that were enrolled or denied admission to the Kepler program. This would increase the study’s rigor and allow for more generalizable and valid findings on Kepler’s ability to utilize innovations in higher education to create a Black middle class in a developing country.

Additionally, future research could integrate interviews and other qualitative data from the match control group, or, at a minimum, students outside of Kepler. In this study, only Kepler students were interviewed, which means that the perspectives of students attending traditional universities in Kigali were absent in the qualitative analysis. In the same way that qualitative data
gave meaning to the quantitative analysis, including the qualitative perspective of non-Kepler students would enable a deeper comparison of students attending Kepler and those at traditional Rwandan university programs.

Another direction for future research, longitudinal studies, asks how innovations in higher education can lead to the creation of a Black middle class. This dissertation is based on data from a limited time span at the beginning of the program. Understanding academic outcomes in the longer term, the ability to secure employment, salaries, job satisfaction, and attitudes about social and financial future cannot be determined in the current research design. Economic and psychological perspectives on students entering the middle class (or perhaps ways in which they have and have not entered the middle class) would offer a rich account and data set on what it means to become a part of the middle class. Additionally, longitudinal studies would allow a deeper exploration of the theoretical framework of Fanon, by enabling graduates to reflect on the ways that participating in a university from the West does or does not support Fanon’s notions of the psychological damage of colonialism. Additionally, a longitudinal study could also compare the development of a Black middle class in Rwanda to that in the U.S. to determine if Frasier’s observations that a Black bourgeoisie creates the same tensions in the Rwandan context as students and graduates work to please employers and the university, which may or may not be tied to White power structures.

Because I only examine one country, expanding the research beyond Rwanda would allow for a richer understanding of the findings and analysis of this dissertation. This could include studying innovative university models in the Great Lakes area of East Africa to understand how innovations in higher education create a Black middle class in a different context. Additionally, seeking models that are similar to Kepler but are running in completely different areas of the world
would also offer an interesting comparison to Kepler’s model. A comparative study of multiple models that aim to move students into the middle class would add nuance to this study, which only examined one institution.

Increasing the data set of interviewees would also further build upon the findings and analysis of this study. Interviewing parents, community members, family, government officials, and the friends of students would deepen an understanding of the program. Because this study focuses upon the views of students in the program, how others see changes in Kepler participants and ways in which the program can improve are absent in this study. Increasing the number and variety of participants interviewed would allow for a richer understanding of how innovations in higher education can lead to the creation of a Black middle class.

This dissertation was a case study conducted to evaluate if the innovative university model implemented at Kepler contributes to the formation of a Black middle class. Upon analysis of the quantitative and qualitative data, I conclude that this model does contribute to the formation of a Black middle class in a developing country, but that there are significant spaces for improvement, as discussed at length within the student’s qualitative responses. With this conclusion, it is important to not only to examine what specifically works in the model’s contribution to the middle class, but also formulate why the model works if this is to serve as a blueprint for other countries, NGOs, universities, and interested organizations.

Two of the significant findings of this study were that the gap between women’s and men’s achievement was narrowed, as well as the gap between rural and urban students. However, outside of these findings challenging the normal performance patterns of student achievement in sub-Saharan Africa, it is also notable that Kepler students across all categories outperform their
counterparts attending traditional universities. These findings beg the question—why does the model work, and what are the most important parts of the model?

Student qualitative data points to the importance of social services provided to the students, who are of limited economic means while studying at Kepler. Students frequently cited the housing provision, the stipend, and the one on one coaching they get as a method to finding success at Kepler. In this regard, the Kepler model matches the theory that if basic needs are met, students can perform better in school. Both the comments of the students as well as their performance levels support that the economic, health, psychological, and food services provided allow students from a poor background to focus on their studies and engage in employment opportunities at the level that those who have more resources are able to do in school and in the workplace.

However, while the social services are important, several students also discussed the essential nature of the Kepler model in terms of their accessibility to an American degree, technology, and the willingness of their course facilitators to work with them on understanding difficult topics. And while students often stated that they felt a level of frustration with the lack of expertise that some course facilitators held in specific subject areas, they were simultaneously grateful that their instructors were available to speak with them whenever they needed assistance. This level of deep support, combined with on-line learning and access to a US degree and the technological skills needed to shine in the workplace are undoubtedly a large part of why the program works. Beyond the blended learning component, the specific help students receive in acquiring and keeping internships and employment opportunities is an essential piece of the model that ensures poor students have the skills needed to move into the middle class.

If one tried to prioritize the components of the model that are most essential, the social services that are provided should likely come first. Without these supports, no matter how strong,
rigorous, or innovative the program is instructionally, deeply impoverished students would struggle to succeed because of the way the stressors of poverty interrupt the desired priorities and opportunities in one’s life. Second to the social services are the employment supports and pathways provided to students, given that this breaks the social capital barriers between the lower and middle to upper economic classes. Without the focus and support in employment, the strong skills students gain in Kepler may not be realized in the workplace. At a close third is the innovative instructional model at Kepler. The way in which students have a unique opportunity to earn a degree from the United States, gain the technological skills that allow them to be competitive with their peers, and explicitly learn the rules of engaging in the workplace are what enable Kepler students to stand out once they are placed in jobs compared to the average Rwandan worker. While the rank order of the program’s success may rest first on social services, next on employment connections and support, and last on the innovative blended learning model, it is not likely the program would have nearly as successful of outcomes if any of the three components were removed rather than the amalgamation of all services together.

As for why this model worked so well for female and rural students, who normally drastically underperform their male and urban counterparts, the individualized attention provided as well as specific group-based interventions are likely the cause of closing these stubborn gaps. For example, along the lines of the theory of bell hooks, who posits that making females relaxed and comfortable in a learning space will lead to better academic outcomes, Kepler conducted periodic sleepovers on the Kepler campus. At these women-only events, students would watch movies, sing karaoke, play games, and generally engage with their female teachers and counterparts in the Kepler space. This allowed for relationship building and comfort that may not occur on a regular Rwandan campus. Additionally, females received weekend trainings and single
gender groups focusing on the specific issues that women may face in tertiary education. These extra interventions likely assisted the women in feeling that the university and campus was a place they belonged in and could thrive. For rural students (and indeed any student with challenges at Kepler) the individualized model likely enabled success. At Kepler, services are not provided in a blanketeted fashion to all students, but are targeted to those whose performance indicates they are in need of extra help. This means that as rural students discussed in the qualitative findings, when they faced stressful situations around learning or technology, there were always course facilitators or staff available to assist. By building the program individually and around the needs of the students rather than a one-size-fits-all model, students entering Kepler with gaps (such as those from rural backgrounds and schools with fewer resources) receive deeper levels of support, whether chosen by the students or mandated by the staff based on performance.

Another important point of consideration is the CfA model itself. From an evaluative standpoint, is CfA the right model—an American degree in the Rwandan context? While the model is certainly wrought with cultural entanglements (for example, offering a health care degree—amongst other degree choices—that’s based on the American system to Rwandan students) overall, the flexibility and price point of the model make it the right choice for an innovative university model in a developing country context. First, because the degree is accredited in the United States but administered by an NGO, Kepler was able to avoid strict governance from Rwandan authorities, while still ensuring quality standards were met through the U.S. partner. This meant there was a level of flexibility in the curriculum that allowed for gender-specific interventions, as well as being nimble in building curriculum to address employer needs. Additionally, the competency-based nature of the degree allows for the students to work flexibly on their projects to earn competencies, while not having them bound to specific class hours. This means students
can master competencies at their own place, but also open up sections of time to allow students to engage in internships and work. Therefore, Kepler students could be available for internships and employment at times when other students could not. The competency based model also helped students see learning as a process rather than as a competition for grades, which translated to their ability to continuously try to improve at tasks in their workplaces as well. Based on the price point, flexibility, and innovative nature of the program (and despite some cultural challenges) overall, the CfA model is well suited to work in an innovative educational program.

However, despite the favorable price point of the model, the sustainability of the program is still of great concern for both the creation of new programs and the continuation of Kepler. Currently, the cost is $5,500 per student, when local universities cost $1,500. While this is subsidized by philanthropy, eventually the program will need to figure out how to either become self-sustainable, or to be fully supported by the government or other official entity. Currently, Kepler is working to create income contingent loans, where students would sign on to pay back the same amount as the cost of a local university. However, payments would not occur until after the student graduated. This is slated to begin in 2018, but is a risky proposition given that there are few loan programs and that students may not fully understand how loan programs work. Kepler is continuing to experiment and innovate on this front, but it remains to be seen if the program is financially sustainable.

In conclusion, this dissertation offers a preliminary examination of how innovations in higher education contribute to the creation of a Black middle class in a developing country. Promising aspects of the Kepler model indicate the model has been able to overcome the underperformance of marginalized populations. At the same time, this study has also opened the
door to several follow-up studies that could be conducted to confirm or refute my findings. Ultimately, Kepler projects a model for moving students in a developing country forward educationally and economically. This research has created pathways to examine how to ensure that the world’s most vulnerable populations have access to an education and program that will transform their lives intellectually and economically.
References


