The impact of home-based educational multi-correlates on academic achievement: an analysis of gender discrepancies in Rwanda

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The impact of home-based educational multi-correlates on academic achievement: an analysis of gender discrepancies in Rwanda

Phillip Haynes

Crimson Foundation, Woodstock, GA, USA

ABSTRACT

The purpose of this study was to investigate the effect of home-based ‘educational multi-correlates’, an inter-related group of factors relating to a child’s home environment, on academic achievement in a primary school in Rwanda. The specific educational multi-correlates considered in this study were parental education level, parental involvement in the child’s education, and family socio-economic status. The students enrolled in the study were 334 children – 167 boys and 167 girls – at a private primary school in post-genocide Rwanda. The primary instrument used to gather data was a Likert scale survey. This, along with the students’ academic records and test scores, was used to answer the following research question: To what extent do specific home-based educational multi-correlates impact academic achievement based on gender within a Rwandan primary school context? The relationships between the independent home-based variables and the dependent variable of academic achievement were measured using descriptive statistics, correlations, multiple regressions, and t-tests. The results confirmed the hypothesis that gender was a relevant factor in explaining differences in the educational correlates and the students’ test scores. Student gender was also found to have a significant effect on parental involvement and family socio-economic status as measured against test scores.

Introduction

Gender parity

Universal primary education and gender equality were two of the Millennium Development Goals (MDG) established by the United Nations in 2000. As a result, many countries in Sub-Saharan Africa implemented educational policies offering all students access to education, with a particular emphasis on gender parity (Nishimura 2017).

Rwanda was among these, and after the genocide in 1994 it developed education policies to address the issues of access to education and gender parity. One of the foundations of this process was the development of Vision 2020 (MINECOFIN 2000), a document outlining the country’s strategic development goals. One of these goals was to prioritise gender equality in all social and economic contexts (Nkurunziza, Broekhuis, and Hooimeijer 2012).
Vision 2020 states,

In order to achieve gender equality and equity, Rwanda will continuously update and adapt its laws on gender. It will support education for all, eradicate all forms of discrimination, fight against poverty and practice a positive discrimination policy in favor of women. Gender will be integrated as a cross-cutting issue in all development policies and strategies. (Vision 2020, Section 5.1)

Subsequent educational policies followed the lead of Vision 2020 in promoting gender equality across Rwanda. Vision 2020 was itself influenced by the aforementioned UN Millennium Development Goals, Education for All (EFA), and the Universal Primary Education (UPE) goals, all of which informed Rwanda’s subsequent policies relating to education and gender. The 2008 Education Sector Strategic Plan (ESSP), the 2008 Girls’ Education Policy (GEP), and the 9-Year Basic Education and 12-Year Basic Education policies were among the policies Rwanda implemented in the light of Vision 2020. As a result of these policies, Rwanda has introduced universal free primary and secondary education for both boys and girls over the last decade (Huggins and Randell 2007; Nkurunziza, Broekhuis, and Hooimeijer 2017; Williams 2017).

These policies have worked impressively well over the last twenty years. In 2003, Rwanda’s national parliament was 48.8% female, which was the highest percentage of women in government in the world at the time (Randell and Fish 2011). The authors also reported that the country improved on this record by electing 56.2% women in 2008. Additionally, the World Economic Forum (WEF) currently ranks Rwanda fifth highest on its Global Gender Gap Index (World Economic Forum 2017). The Global Gender Gap Index is an assessment of a country’s gender parity along several axes: educational achievement, health, political power, and participation in the economy. In terms of educational equality specifically, Rwanda has achieved full equality in gross primary and secondary school admissions, with a Gender Parity Index (GPI) of 1.00 in both cases. The country’s GPI for students beginning tertiary education is 0.787 (World Economic Forum 2017). These figures mean Rwanda is close to achieving the measures of educational gender equality in the MDG and UPE goals mentioned above. ‘While central to development, such measures fail to emphasise equitably the protection of gender rights at the level of higher education.’ (Randell and Fish 2011, 8). There is still scope for improvement in the gender balance of enrolments in tertiary education, but the progress which has been made at the primary and secondary levels should be celebrated.

According to the data, Rwanda is among the world’s leading countries in reducing gender inequality in a number of important domains, including enrolment in education and political involvement. However, some writers have argued that, although enrolment rates are equal, there are still important gender disparities in other aspects of education, after the initial enrolment. Female students are still more likely to drop out of education and less likely to complete their studies, and their achievements in terms of test scores are lower (World Bank 2006; UNESCO 2013; Nishimura 2017).

The improvement in overall school enrolment rates is a positive outcome, but it reveals underlying problems, such as the need for more quality school facilities to accommodate the increasing student population. The increase in enrolment has also made more apparent the effects of poverty and how it exacerbates the existing problems of poor achievement, high dropout rates, and high rates of grade repetition.
A recent study in Senegal showed that, although more girls than boys were enrolling in primary school, boys were passing the leaving exams at a higher rate than girls (Nishimura 2017). Data from MINEDUC (see Table 1 below) shows that the same applies in Rwanda: more girls are enrolling, but more boys are completing school (MINEDUC 2016). According to Huggins and Randell (2007),

it is well recognized that completion rates for girls are lower than those for boys at all educational levels. Poverty and low levels of achievement are the most significant reasons that students drop out of school at the primary level, and there are considerable disparities between urban and rural children. (6)

There is a clear need to address the issues of dropout rates and low achievement for primary school students, but there is a lack of literature investigating the specific variables which influence these outcomes, and the way they interact with gender. Therefore, this study investigates gender variation in educational achievement and educational multi-correlates at a Rwandan primary school.

Educational multi-correlates are a set of inter-related factors which are not mutually exclusive and which affect academic achievement (Haynes 2015). The specific multi-correlates those effects will be assessed in this study are those relating to a child’s home environment, namely parental education, parental involvement and socio-economic status.

**Literature review**

**Theoretical framework for social capital**

Social capital is a theoretical construct which explains, from a behavioural perspective, the influence of financial capital on human capital. It originates from the Coleman Report (Coleman et al. 1966).

Coleman wrote:

> Broadly defined, social capital is the aggregate of the actual or potential resources embedded in social networks that may be converted into other manifestations of capital, including material capital (Bourdieu 1986), human capital (Coleman 1988), and healthy civic participation and community cohesion. (203)

Bourdieu’s and Coleman’s work inspired several research studies on the topic of social capital, exploring its relationship with academic achievement (Pishghadam and Zabihi 2011, 51) and with other variables.

Social capital can be thought of as the aggregate of all variables which have an effect on upward mobility, whether directly or indirectly. These factors can include personal academic achievement, the state of the labour market in which an individual operates, and the health and food security of the family or of the individual. The social capital model explains the ways in which student achievement can be influenced by the relationships

<table>
<thead>
<tr>
<th>Table 1. Matrix of survey questions by domain of study.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dependent variables</strong></td>
</tr>
<tr>
<td>-------------------------</td>
</tr>
<tr>
<td><strong>Home factors</strong></td>
</tr>
<tr>
<td>Parental Education</td>
</tr>
<tr>
<td>Parental Involvement</td>
</tr>
<tr>
<td>SES</td>
</tr>
</tbody>
</table>
between schoolchildren and key participants in their lives, such as parents and teachers (Dufur, Parcel, and Troutman 2012, 3). This model was adopted in this study in order to gain an understanding of the effect of the home-based elements of social capital on academic achievement.

The hypothesis of this study was that these elements of social capital would indeed affect students’ academic achievement and test scores in relation to gender.

**Academic achievement**

This section seeks to unpack the literature on educational inputs and student achievement. In the early 1970s, findings from the Coleman report on family influences on schooling, education, and achievement prompted researchers to begin performing comparative educational studies that often included developing nations (e.g. Baker et al. 2002). In the span of the next 40 years, researchers discovered numerous variables or contributory social capital-related factors that influenced academic achievement (Dika and Singh 2002; Shriner, Mullis, and Shriner 2010).

Academic achievement in today’s educational landscape is synonymous with student performance (Wiggins 1998; Freeman et al. 2014), academic outcomes (Multon, Brown, and Lent 1991; Zhang and Lynch 2018), learning achievement (Zimmerman 1989; Zarzour and Sellami 2018), and standardised test scores (Lord 1952; Fahle and Reardon 2018). Academic achievement is commonly measured through continuous testing and evaluation to include examinations of skills or facts (Ward, Stoker, and Murray-Ward 1996). Although, there is no general agreement on how academic achievement is best measured, the consensus in the literature reflect continual testing of students’ cognitive ability.

**Parental education**

Parental education has also been shown to significantly increase student achievement, school enrolment, and completion rates. Parental education is one of the strong determinants of student achievement (Vellymalay 2011). In fact, additional studies found that the more highly educated the parents, the greater chance of increased access to education, and the higher the attendance rate (Connelly and Zheng 2003; Duryea and Arends-Kuenning 2003). Parental education is found to have a strong association with student achievement (Neupane 2017). Furthermore, educated parents can assist their children in their studies and homework (Dundar et al. 2014). Moyi (2013) found that for children in Uganda, educational attainment of parents contributed to children’s daily school attendance and school completion rates. Additionally, parental past educational experiences influenced children’s continued access to and progress through school. In a study conducted in West Africa by Glick and Sahn (2000), a mother’s education was found to have a significant impact on her daughters’ schooling. In addition, the findings reported that a father’s education raised the completion rates for both girls and boys. Parental levels of education impact both student achievement and school completion.

Paternal and maternal levels of education were significant factors in creating a positive home environment and influencing student academic attainment (Admasu 2004; Smits and Hoşgör 2006). The influence of a father’s educational attainment has been reported
to positively impact both boys and girls. More specifically, additional research highlighted the fact that the father’s educational level played a larger role for boys (Hanushek and Lavy 1994; Tansel 1997). A mother’s educational attainment level was also reported to influence both boys and girls. Girls were reported to perform better compared with boys in reading when mothers were educated (Glick and Sahn 2000). Research on parental education has shown that access to books and reading materials influenced student achievement as well. For example, in a study in Mauritius on the impact of parental educational support on numeracy test results, researchers found that parental support of education at home positively impacted student achievement (Sukon and Jawahir 2005). In a similar study in Malaysia, researchers reported that both parents’ level of education and reading materials available in the home were related to children’s academic achievement (Hanafi 2008).

**Parental involvement**

Parental involvement is another household characteristic that has been linked to student performance (Ceballo et al. 2014; Yaseen, Zaman, and Rasheed 2017). Castro et al. (2015) performed a meta-analysis of 37 studies published from 2000 to 2013 on parental involvement and academic success. They concluded,

parental models most linked to high achievement are those focusing on general supervision of the children’s learning activities. The strongest associations are found when the families have high academic expectations for their children, develop and maintain communication with them about school activities, and help them to develop reading habits. (33)

In South Africa, research reported positive correlations between parental involvement and student achievement (Bojuwoye and Narain 2008; Van Staden and Bosker 2014). In a similar study on South Africa, researchers examined links between parental involvement at disadvantaged schools and student performance. The researchers suggested that a lack of parental involvement in the teaching and learning of their children contributed to a lack of successful academic achievement of children in schools (Sedibe 2012). More specifically, parental involvement has been associated with a direct impact on literacy levels in low-income countries (Geske and Ozola 2008; Van Staden and Bosker 2014). A study conducted by Sénéchal and Young (2008) also found parental involvement to be of pivotal importance in children’s literacy development, and found that larger effects could be expected when parents tutored their children using specific literacy activities. Lynch and Cicchetti (2002) found significant relationships between parents’ self-efficacy beliefs and children’s reader self-perceptions.

There have been several studies looking at gender differences, parental involvement and scholastic achievement in areas including single parenting (Uwaifo 2008; Abudu and Fuseini 2013), achievement in science and math (Olatoye and Ogunkola 2011; Nyabuto and Njoroge 2014), and school and home involvement (Nyarko 2011; Amponsah et al. 2018). In a study conducted by Salami and Alawode, the researchers concluded that there is a significant difference between the academic achievement of male and female adolescents from single-parent homes, with girls scoring higher than boys (Salami and Alawode 2000). In a Ghanaian study, several authors posited that parents are more involved at home than at school for female children and more involved at school than at home for male children. One plausible explanation the authors suggested is that this gender difference may be a
consequence of social norms that have long favoured active participation in school for boys and at-home schooling for girls (Chowa, Ansong, and Osei-Akoto 2013). However, other researchers have posited that there are no significant gender differences in math and science scores (Olatoye and Ogunkola 2008; Olatoye and Agbatogun 2009). In contrast, Dee (2007) asserted that there are significant differences that favour male students.

**Socio-economic status**

The income levels within low-income countries vary across cities, communities, and families. The literature regarding family wealth indicates that socio-economic status plays an important part in determining school completion and dropout rates (Van der Berg, 2008; Newbury and Baldwin, 2000), English test scores (Neupane 2017), and enrolment (Mwangi and Ngao 2017). Generally, the wealth of families increases the likelihood that students will succeed in school (Iddrisu, Danquah, and Quartey 2017). For example, in a study conducted in Kenya on the primary differences between girls and boys, researchers reported that children who scored higher on the household wealth index for home quality and materials owned had higher school completion rates than children who received a lower score on the household wealth index (Lloyd, Mensch, and Clark 2000). In a similar study conducted in Pakistan looking at determinants of school completion, Holmes (2003) found that the value of land and property owned by the household influenced school completion. The more land and property owned by parents in Pakistan, the more likely that children completed school at the primary level. The results reemphasized the importance of establishing poverty reduction initiatives within developing countries to develop policies to advance per capita levels of income.

The effects of gender differences and socio-economic status on student performance have also been examined. For example, Hungi and Thuku (2010) noted that pupils from homes with better quality of houses and having many possessions were estimated to achieve better in school. Furthermore, the authors concluded, younger pupils were estimated to achieve better in both subjects than their older counterparts, while boys were estimated to achieve better than girls in mathematics but not in reading. The authors reported that boys outperformed girls in mathematics in Kenya as a whole and across all provinces based on wealth. According to Glick and Sahn (2000), increases in household income led to greater investment in girls’ schooling in particular. Zuze and Reddy (2014) found that socio-economic levels improved educational outcomes for girls more effectively than for boys. In contrast, Senghor and Wolff (2017) found that the impact of income was also particularly significant in the case of boys’ academic achievement. Furthermore, the proportion of students completing primary education and achieving a proficient level in the primary leaving exam is affected by the relationship between SES and gender. For instance, in Senegal, Benin, Uganda, and Kenya, high-SES males perform the best, and low-SES females perform the worst (UNESCO 2013). The overarching conclusion is that SES influences boys and girls differently.

**Summary**

In looking at specific educational inputs, namely parental education, parental involvement, socio-economic status and perhaps academic achievement effects in relations to
gender, there is a dearth in the literature in Rwanda. Most studies looking at academic achievement in Rwanda examine aspects of access to education versus quality and its impact on student dropout rates and overall enrolment. Little empirical studies unpack specific home based variables that may influence academic achievement. Furthermore, no studies exist in Rwanda that disaggregates data based on gender to explain significance or directionality of impact on parental education, parent involvement, socio-economic status, and student performance in school. This study investigates the intersectionality between educational multi-correlates and their impact on academic achievement in relations to gender.

**Conceptual framework**

The purpose of this study was to understand the extent to which the educational multi-correlates impact academic achievement for boys and girls differently at a private primary school in Rwanda. Thus, the research is primarily tasked to answer one specific research question: To what extent do specific home-based educational multi-correlates impact academic achievement based on gender within a Rwandan primary school context?

The input variables for this study that were investigated included: (1) Parent Education, (2) Parent Involvement, (3) Socio-economic Status (SES), and (4) Gender. The variables selected allowed for the exploration of the impact of the social milieu on children’s academic achievement. The theoretical framework, as discussed in the previous section, allowed for the contextualisation of the variables that will be explored in the study. The figure below represents the framework for understanding the interactions between the research question, multi-correlates, and student test scores (Figure 1).

The input variables and research constructs were used to create and support the research question. The research question is:

To what extent do specific home-based educational multi-correlates impact academic achievement based on gender within a Rwandan primary school context?

![Figure 1. Academic achievement conceptual model.](image-url)
Methods

Data collection and analysis

This research explored three home-based educational multi-correlates and their effect on students’ academic achievement. The educational multi-correlates were the independent variables, and statistical methods were used to evaluate their relationship and the significance of their effect on student academic performance.

A five-point Likert scale survey, conducted at the primary school in Rwanda, was used to gather participant responses on topics including parental education, parental involvement, and socio-economic status. The educational multi-correlates survey contained 15 questions. Each independent variable contained multiple survey items. For example, parental education was quantified by assigning numbers to categories of parental education levels (no education = 1, primary education = 2, secondary education = 3, and tertiary education = 4). In measuring parental education, we asked research participants to report the level of education of both mother and father. The minimum composite score for the independent variable parent education was 2 and the maximum was 9 based on participant responses. These same principles were applied to develop a composite independent variable score for both parent involvement and socio-economic status. The total summated score for each independent variable was derived to measure against student test scores. Table 1, presented below, identifies the independent variables respectively and their corresponding survey items.

Data was also gathered from school records, including enrolment records, grade books and test scores. Academic achievement was specifically measured by collecting and analyzing student standardised test across five subjects of interest including English, Science, Social Studies, Math, and Kinyarwanda. The test scores for each student across each subject were aggregated into one standardised test score. The students’ test scores were used as the dependent variable. The data from school records was codified into demographic categories, and was explored from the perspective of gender.

SPSS version 22 was used for the data analysis, and relevant statistical tools were used to address the research question. The data analysis was conducted using descriptive statistics, correlations, multiple regression tests, and a t-test. The nature of the relationship between the variables was investigated using correlation analysis, and the relationship between the educational multi-correlates and the students’ academic achievement was measured using Pearson’s $r$ product-moment, which is appropriate for continuous variables. The alpha levels used for the significance tests were .01 and 0.05.

A multiple regression model, in which the dependent variable was a composite of the students’ test scores across all subjects studied, and the independent variables were the educational multi-correlates, was used to assess the predictive power of the independent variables on the students’ test scores.

T-tests, with a significance level of 0.05, were used to determine whether there were significant differences across all the multi-correlates between male and female students.

Participants

The school used for the study was an English-speaking private primary school in rural Rwanda. Its location is in the Kamonyi District, Rundi Sector, in the Kagina cell. There
is no central village in the area, but the school educates students from a region extending up to 10 miles away.

The area where the school is located has undergone rapid economic growth in the last five years. The school is at the top of a mountain, and is around 10 miles from the nearest hospital; but in recent years the school and nearby homes have been connected to the electrical network, and they are expecting to be connected to the water supply soon.

There were 344 students enrolled at the school at the time of the study. It had an average teacher:student ratio of 1:57, and one classroom per grade. The classrooms were all filled to capacity.

The average student age is higher than might be expected for a primary school, because the school is the only one in the area, and only opened in 2011, and is therefore the only opportunity for local children and teenagers to access education. The average age of students in the Primary 6 classroom, the equivalent of American sixth grade, was 16, as can be seen in Table 2; and the oldest student in the school was 21.

Results

Descriptive statistics by gender

Table 3 indicates the difference between the mean score for parental education for male students calculated at 5.51 (N = 167, SD = 1.66), and the mean score for parental education for female students at 5.52 (N = 167, SD = 1.88). In contrast, for the parental involvement variable, the results showed more variation in the mean score for male students at 12.67 (N = 167, SD = 3.24) and the mean score for parental involvement for female students at 13.25 (N = 167, SD = 3.62). The results indicate that parents showed more involvement with female students than with male students. There is a minimal 1% difference between the mean score for socio-economic status for male students at 20.17 (N = 167, SD = 6.17) and the mean score for socio-economic status for female students at 20.46 (N = 167, SD = 5.52).

<table>
<thead>
<tr>
<th>Table 2. Distribution of gender and average age.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender and age distribution</td>
</tr>
<tr>
<td>Grade level</td>
</tr>
<tr>
<td>Average age</td>
</tr>
<tr>
<td>Number of boys</td>
</tr>
<tr>
<td>Number of girls</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 3. Descriptive statistics on home variables by gender.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum</td>
</tr>
<tr>
<td>Test score (N = 167)</td>
</tr>
<tr>
<td>Parent education (N = 167)</td>
</tr>
<tr>
<td>Parent involvement (N = 167)</td>
</tr>
<tr>
<td>SES (N = 167)</td>
</tr>
<tr>
<td>Test score (N = 167)</td>
</tr>
<tr>
<td>Parent education (N = 167)</td>
</tr>
<tr>
<td>Parent involvement (N = 167)</td>
</tr>
<tr>
<td>SES (N = 167)</td>
</tr>
</tbody>
</table>
Correlations by gender

Table 4 shows that both male and female student test scores were not significantly correlated with parental education \((r = -0.04\) and \(r = 0.02\) respectively). Interestingly, female student test scores were significantly correlated negatively with parental involvement \((r = -0.29)\). The findings show that parental involvement has a weak negative correlation with student achievement for female students. Male and female test scores are significantly correlated positively with SES \((r = 0.34\) and \(r = 0.35\) respectively). This indicates that for both male and female students, the socio-economic status of families has a moderate positive correlation with academic achievement.

Regression analysis by gender

Several independent variables are explored to predict their impact on student performance, as shown in Table 5. The independent variable parental education is a significant predictor of higher male student test scores \((\beta = -0.11, t = -1.39, p < 0.05)\). The independent variable parental involvement is a significant predictor for student test scores for female students \((\beta = -0.29, t = -3.98, p < 0.05)\). However, parental involvement is not a significant predictor for male student test scores \((\beta = 0.01, t = 0.17, p < 0.05)\). Both male and female socio-economic status are a significant predictor for student test scores \((\beta = 0.36, t = 4.85, p < 0.05,\) and \(\beta = 0.35, t = 4.70, p < 0.05,\) respectively).

t-Test by gender

The results in Table 6 show that there is no difference between students’ level of parental education for boys \((M = 5.51, SD = 1.66, p < 0.05)\) and girls \((M = 5.52, SD = 1.8, p < 0.05)\).

Table 4. Correlations on home variables by gender.

<table>
<thead>
<tr>
<th></th>
<th>Parental involvement</th>
<th>SES</th>
<th>Student test scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correlations for male students ((N = 167))</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parental education</td>
<td>.37**</td>
<td>.20*</td>
<td>-.04</td>
</tr>
<tr>
<td>Parental involvement</td>
<td>1</td>
<td>.05</td>
<td>-.01</td>
</tr>
<tr>
<td>SES</td>
<td>1</td>
<td></td>
<td>.34**</td>
</tr>
<tr>
<td>Correlations for female students ((N = 167))</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parental education</td>
<td>.34**</td>
<td>.36**</td>
<td>.02</td>
</tr>
<tr>
<td>Parental involvement</td>
<td>1</td>
<td>.02</td>
<td>-.29**</td>
</tr>
<tr>
<td>SES</td>
<td>1</td>
<td></td>
<td>.35**</td>
</tr>
</tbody>
</table>

*p < 0.05, **p < 0.01.

Table 5. Regression on home variables by gender.

<table>
<thead>
<tr>
<th>Dependent variables</th>
<th>Beta</th>
<th>t</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression coefficients for male students ((N = 167))</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parental education</td>
<td>-0.11</td>
<td>-1.39</td>
<td>0.17</td>
</tr>
<tr>
<td>Parental involvement</td>
<td>0.01</td>
<td>0.17</td>
<td>0.87</td>
</tr>
<tr>
<td>SES</td>
<td>0.36</td>
<td>4.85</td>
<td>0.00</td>
</tr>
<tr>
<td>Regression coefficients for female students ((N = 167))</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parental education</td>
<td>-0.00</td>
<td>-0.07</td>
<td>0.95</td>
</tr>
<tr>
<td>Parental involvement</td>
<td>-0.30</td>
<td>-3.98</td>
<td>0.00</td>
</tr>
<tr>
<td>SES</td>
<td>0.35</td>
<td>4.70</td>
<td>0.00</td>
</tr>
</tbody>
</table>
Likewise, there is no difference between students’ level of parental involvement for boys ($M = 12.67$, $SD = 3.24$, $p < 0.05$) and girls ($M = 13.25$, $SD = 3.62$, $p < 0.05$). The results for socio-economic status showed that there was no significant difference between boys ($M = 20.17$, $SD = 6.17$, $p < 0.05$) and girls ($M = 20.46$, $SD = 5.52$, $p < 0.05$). For the last independent variable student test scores, the results for student test scores showed that there was no significant difference between boys ($M = 344.68$, $SD = 110.15$, $p < 0.05$) and girls ($M = 343.71$, $SD = 104.75$, $p < 0.05$).

**Discussion and implications**

The findings were summarised based on the constructs for the study. The constructs were used to recapitulate the results as reflected in the literature on factors that influence academic achievement in East Africa and broader low-income countries.

**Findings related to the home dimension**

The research construct for this study was a compilation of several variables that have been proven to impact students’ academic achievement, including parental education, parental involvement, and socio-economic status educational inputs. The results are reviewed and delineated by gender.

**Correlation findings by gender**

- Parent involvement reported a negative significant correlation with student academic achievement for female students.
- SES reported a positive significant correlation with student academic achievement for male and female students.

**Regression analysis findings by gender**

- Parental involvement predicted academic achievement for female students.
- SES predicted academic achievement for both male and female students.

**t-Test findings by gender**

- Parental education showed no significant deference between male and female students.
- Parental involvement showed no significant deference between male and female students.

### Table 6. t-test on school-based variables by gender.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Gender</th>
<th>N</th>
<th>Mean</th>
<th>Std. Dev</th>
<th>df</th>
<th>t</th>
<th>P</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education</td>
<td>Male</td>
<td>167</td>
<td>5.51</td>
<td>1.66</td>
<td>330</td>
<td>1.97</td>
<td>0.95</td>
<td>Not Significant</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>167</td>
<td>5.52</td>
<td>1.8</td>
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<tr>
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<td>328</td>
<td>1.97</td>
<td>0.13</td>
<td>Not Significant</td>
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<tr>
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<td>167</td>
<td>13.25</td>
<td>3.62</td>
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<tr>
<td>SES</td>
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<td>20.17</td>
<td>6.17</td>
<td>328</td>
<td>1.97</td>
<td>0.65</td>
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<tr>
<td></td>
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<td>167</td>
<td>20.46</td>
<td>5.52</td>
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<tr>
<td>Test Scores</td>
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<td>344.68</td>
<td>110.15</td>
<td>331</td>
<td>1.97</td>
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<tr>
<td></td>
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<td>167</td>
<td>343.71</td>
<td>104.75</td>
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Significance ($p < 0.05$).
• Socio-economic status showed no significant deference between male and female students.
• Student test scores showed no significant deference between male and female students. Surprisingly, the findings showed that parental involvement had a weak negative correlation with student achievement for female students. In addition, the regression analysis showed that girls are directly impacted by parental involvement. Although there are many studies that examine parental engagement and academic achievement, there is a dearth within the literature addressing gender inequalities, parental involvement, and student performance. However, some studies have reported a negative relationship between parental involvement and academic achievement. In a study conducted by Smith and Barrett (2011) examining 14 Sub-Saharan countries, the authors posited that parental involvement had minimal negative effects on student outcomes. Similarly, in a meta-analysis examining 20 prior studies, Patall, Cooper, and Robinson (2008) concluded that parental involvement had a negative impact on student performance in mathematics. Furthermore, the authors reported that specific parental monitoring approaches, including controlling versus informative monitoring styles, impacts academic achievement in mathematics. Lastly, in a Ghanaian study, Chowa, Ansong, and Osei-Akoto (2013) posited that in-school parent involvement was negatively associated with performance. Although these studies did not disaggregate the data based on gender, the implications suggest that more research is needed to determine the root causes of the negative association between parental involvement and girls’ achievement. Conversely, the findings also showed that parental involvement was a strong predictor for female students’ academic performance. The evidence as presented in the literature agrees with the research findings. Based on the preponderance of other research examining the relationship between parental involvement and academic achievement, parental involvement has been found to positively impact student outcomes (Hixon 2006; Jeynes 2007; Guolaug 2010).

When looking at the findings for SES, the results show socio-economic status had a moderately positive significant relationship with academic achievement for both boys and girls. However, the relationship was minimally stronger for girls. Reddy et al. (2015) reported a similar finding that socio-economic levels improved educational outcomes for girls more effectively than for boys. The results from this study also showed that higher SES was a strong predictor of academic achievement for both boys and girls. These findings are in harmony with other studies that have linked student performance to family and student wealth (Lee and Zuze 2011; Chinyoka and Naidu 2014; Iddrisu 2014). A study exploring the relationship between SES and achievement in Botswana and Ghana reported mixed results (Dunne et al. 2005). The researchers concluded that male students outperformed female students in all school categories in Ghana, and in Botswana two of the three low-performing schools had gender gaps in favour of girls. Lastly, the authors concluded that more research is needed to explore the interactions of gender with student performance and SES. The specific components of human and social capital and their impact on achievement within the lens of gender has been well documented in the literature.

**Implications**

The implications of this work are important for anyone interested in children’s educational achievement, especially children from primary schools in Rwanda. School
administrative and teaching staff, those in government responsible for setting educational policy, and parents are three overlapping groups who share the ability to influence Rwanda’s children and thereby direct the country’s future, and who could all benefit from these findings.

This study has shown that the educational multi-correlates under consideration have a direct effect on children’s educational performance. The study has contributed towards filling a gap in the research on the most effective, practical and proven ways in which school staff and government policymakers can improve children’s educational outcomes, particularly in a rural context.

Although the previous literature did not supply a formal theoretical model for the analysis of educational multi-correlates, it nonetheless provided a detailed context in which discussions about improving academic achievement can take place. Previous work on the factors affecting educational performance has shown that completion rates and final grades can be improved by educational policies focusing on school staff and parents, and outcomes for children in poorer countries can be improved by educating school administrative staff about the factors contributing to academic success. The academic discourse on student outcomes, and those responsible for proposing can shape educational policy, particularly in low-income countries, and developing policies can be equipped to incorporate informed strategies for improving poor outcomes.

Future research

One limitation of this research is that it was sampled from a single rural private primary school, so there is potential for a follow-up study to investigate the same correlations among participants sampled from the whole of Rwanda and from both private and state-run schools, to verify whether the findings persist across this larger and more diverse sample. The survey framework could also be adapted for students at secondary school, to determine whether the same factors apply in that context.

Another constraint within the research stemmed from the research population. Other educational inputs such as teacher quality and school quality could not be measures due to the lack of comparative analysis with other Rwandan primary schools as a result on the population coming from one school. More research is needed specifically looking at additional educational inputs such as teacher and school quality and their relationships or possible effects on student achievement in Rwanda. Researchers will have the ability to investigate differences between school types (rural versus urban and government versus religious) and region.

The results of the survey of educational multi-correlates revealed a surprising negative correlation between parental involvement and student achievement, so further research is needed to tease apart the components of parental involvement and discover exactly which of them cause this negative effect on student performance. Further research could also explore how the negative correlation between parental involvement and student achievement is moderated by gender, taking into account the cultural expectations for each gender.

Finally, a potential avenue for research would be into the activities children undertake outside of school, the extent to which these obstruct or inhibit performance in school, and whether this relationship is moderated by parental involvement.
Disclosure statement

No potential conflict of interest was reported by the authors.

Notes on contributor

Phillip Haynes holds a bachelor’s degree in Human Development from Howard University, a master’s degree in Administration, Planning, and Social Policy from Harvard University, and a doctorate degree in Educational Leadership from the University of Georgia. Phillip is the founding member and Executive Director of Crimson Foundation. In this capacity, Phillip provides direction and leadership on educational research and services for children. Phillip is a native of Los Angeles, California, but lived in Australia, Canada, and Ireland before settling in Atlanta.

ORCID

Phillip Haynes http://orcid.org/0000-0001-7578-1807

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