



Gender attitudes and perceptions towards STEM subjects in Rwandan secondary schools

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Introduction

- The 2030 Agenda for Sustainable Development (Leave No One Behind) provides a shared blueprint for *peace* & prosperity for *people* and the *planet*, now and into the future.
 - Two of the SDG goals important for this presentations are the SDG 4 & 5
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Gender and STEM Education

- The world over, girls & women are significantly under-represented in STEM subjects
 - According to UNESCO (2017) girls appear to lose interest in STEM subjects as they get older
 - The gender gap in STEM becomes apparent in upper secondary education, as reflected in girls' choices of advanced studies in mathematics and science.
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Gender & STEM in Rwanda

- In the last 20 years or so the Rwanda government has promoted gender equality in education in terms of policy and interventions.
- Statistics show near gender parity in access at primary; And more females students at secondary level; although the representation of females drops at tertiary level
- However, there are gender differences in students enrolled in STEM at upper secondary and at higher education

Female vs male representation at different level of education (Mineduc, 2020/21)

Level of education	% male	% female
Primary	50.2%	49.9%
Secondary	46.4%	53.6%
TVET (L1-5)	53.3%	46.7%
Polytechnic	72.7%	33.7%
HE	55.1%	44.9%
HE (public)	66.3%	33.7%

Students enrolled in STEM by level

Level of Education	% male	% female
Upper secondary	62.5%	48.4%
TVET	85.9%	39.5%
Higher Education	64.85%	36.15%





Gender & STEM in Rwanda cont'd

- The under representation of girls and women in STEM in Rwanda is attributed to a number of factors, among them the attitudes & perceptions of students, teachers and even parents towards girls and STEM (Uworwabayeho et al., 2007); Habineza, 2016 & Uwineza et al., 2018).



Attitudes & Perceptions towards Mathematics

- ▶ A study conducted by Uwineza et al in 2018 examining students' and teachers' attitudes & perceptions towards girls & boys enrolment and performance in mathematics in 4 secondary schools exhibited gender differences and biases towards female students
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Perceptions about teaching, learning & performance in mathematics

- Mathematics tends to be perceived as a male dominant area in terms of teaching & learning
- Girls were perceived as lacking confidence, lazy, anxious and fearful towards mathematics as a subject compared to boys.
- Even girls who excelled in the subject were seen as the exception or "of male character"
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Perceptions about T & L and performance cont'd

- Teachers attitudes were no different, with most saying they preferred teaching mathematics to boys than to girls because girls find it difficult to learn the subject.

One teacher mentioned that:

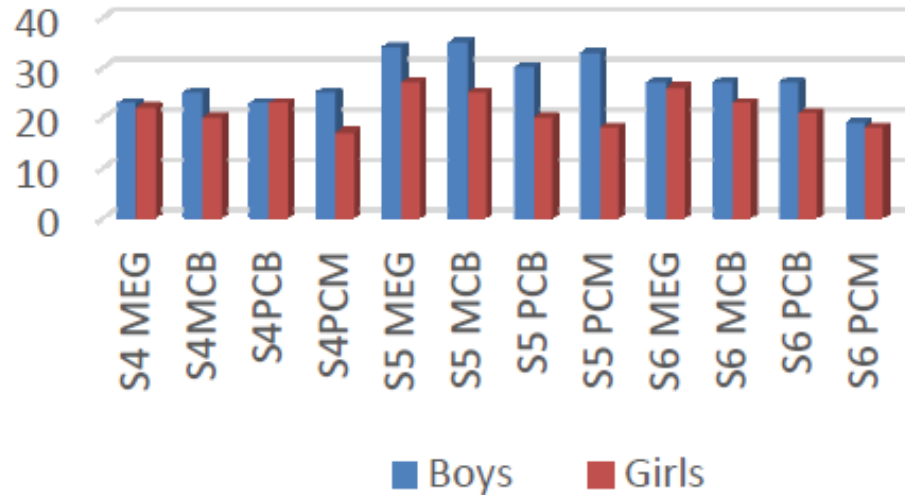
“girls memorize mathematics concepts without reasoning... they don't pay attention to questions before working on it”

Enrollment in mathematics

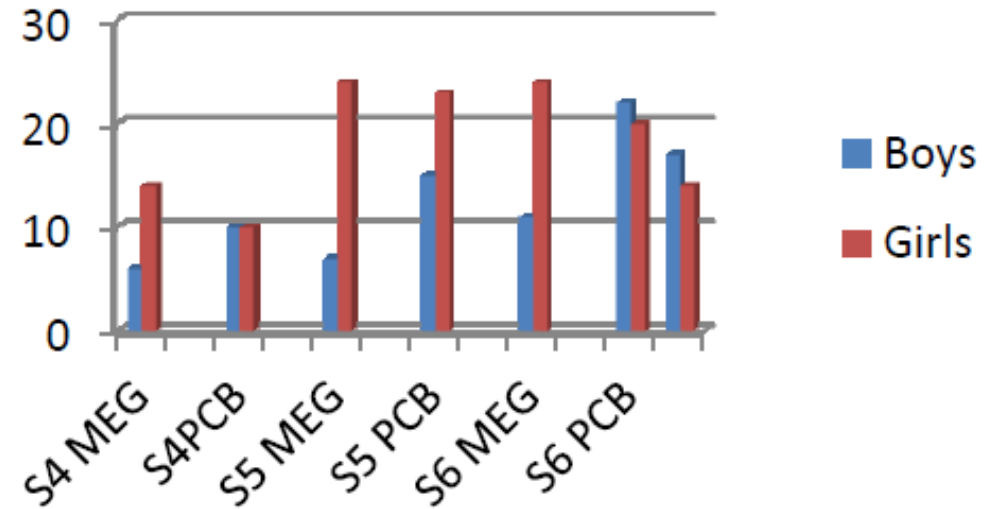
- In terms of enrolment in mathematics subject combinations in the 4 schools sampled, more boys than girls were enrolled in combinations like
 - Maths/Chemistry & Biology (MCB),
 - Physics, Chemistry & Biology (PCB),
 - Physics, Chemistry & Maths (PCM),
 - Maths, Chemistry & Biology (MCB) except in Maths, Economics & Geography (MEG)
- There was no female mathematics teacher in the 4 schools at the time of the research.

Boys' and girls' enrolment at Advanced level (all 4 schools)

A-Level, public school enrolment





A-Level, Private school enrolment





Perceptions about enrollment in mathematics

- Boys & girls shared the perception that girls enrollment in mathematics reduces at adolescence because girls at this stage are more concerned about their body image which takes up much of their time
 - There is also the perception that girls naturally like an easy life, yet mathematics requires hard work
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Perceptions about enrollment in mathematics cont'd


- However, some girls challenge these perceptions:

“I chose mathematics combination to challenge the common belief that girls do not like mathematics and cannot perform well in it”.

- For others it may be the future career related to mathematics that put them off. The future of a mathematician was likely associated with teaching, a career that is least appreciated.



Conclusion

- The above perceptions and others like them may result from gender stereotypes referred to as “unconscious sexism” (Ernest, 2004), which continue to alienate girls & women from mathematics & STEM fields in general
 - The under representation of women in such field tends to perpetuate future underrepresentation since girls and women continue to lack role models to emulate.
 - Any type of underrepresentation inevitably leads to missed opportunities and the loss of mathematical talent – at both an individual and national level.
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Recommendations

- The promotion of STEM subjects should go hand in hand with addressing gender biases and cultural attitudes that push girls out of mathematics and science. This can be done consistently through Teacher Training Programmes & other areas of education.
- Similarly gender related barriers in employment should be tackled for girls and women to see a future in STEM related employment and freely choose to study STEM subjects
- More research especially longitudinal studies in the area of STEM and gender are required to continue to inform the process of policy formulation e.g. the awarding of 85% govt scholarship to STEM related subjects at HE .



Thank you