



Understanding teaching quality in Rwandan secondary schools

Learning from the Leaders in Teaching
initiative 2020



Leaders in
Teaching



Research for Equitable Access and Learning

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DATA | RESEARCH | ADVISORY

Acknowledgements

This report summarises research carried out by Laterite and the Research for Equitable Access and Learning (REAL) Centre at the University of Cambridge in partnership with the [Mastercard Foundation](#) as part of the [Leaders in Teaching](#) initiative.

The learning partners would like to thank the teachers, school leaders and students, as well as the Mastercard Foundation and the Leaders in Teaching implementing partners, who contributed their insights to this study.

About the learning partners

Laterite is a data, research and advisory firm dedicated to bringing high-quality research services to the most underserved markets. Based in East Africa, the firm strives to carry out impactful research that helps decision-makers find solutions to complex development problems.

The REAL Centre at the University of Cambridge, pioneers research into overcoming barriers to education, such as poverty, gender, ethnicity, language and disability, and promotes education as an engine for inclusive growth and sustainable development.

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Introduction

About Leaders in Teaching

Leaders in Teaching is a five-year Mastercard Foundation initiative established in 2018 to improve the quality of teaching and learning in Rwandan secondary schools, with a focus on science, technology, engineering and mathematics (STEM) subjects. The initiative aligns with the Government of Rwanda's goals outlined in [Vision 2050](#) to become a knowledge economy. More specifically, Leaders in Teaching responds to strategic priorities outlined in Rwanda's [Education Sector Strategic Plan 2018/19 to 2023/24](#), aiming to enhance the quality of learning outcomes, as well as teacher professional development and management, with a focus on STEM and ICT teaching and learning in 14 districts¹ of Rwanda. Leaders in Teaching consists of programmes led by six implementing partners - the African Institute for Mathematical Sciences (AIMS); Carnegie Mellon University Africa; Inspire, Educate and Empower Rwanda; UNICEF Rwanda; University of Rwanda College of Education; and VVOB Rwanda - in partnership with the Mastercard Foundation. Laterite and the REAL Centre are the learning partners for the initiative, responsible for generating evidence of improved teaching and learning.

Work of the learning partners in 2019-20

In 2019-20, Laterite and the REAL Centre carried out research activities to assess teaching quality within the Leaders in Teaching programme for the Rwandan context, and support continuous learning and improvement within the initiative. Findings from this research are available in the Leaders in Teaching Research and Policy Series, a growing evidence base of research insights on school resources, school leadership, classroom practices, teaching quality and any potential for links between teaching quality and student outcomes. Figure 1 provides an overview of the data collection activities carried to the end of 2020, including a summary of Leaders in Teaching Research and Policy Series publications that draw on these data. These publications provide an in-depth overview of the context for secondary teaching and learning in Rwanda's 14 Leaders in Teaching districts at baseline - prior to and during the onset of COVID-19. The learning partners will build on this evidence as Leaders in Teaching continues in the coming years.

About this paper

This paper is a synthesis of the key systemic factors associated with teaching and learning quality in Rwandan secondary education, informed by learning partner research carried out in 2019-20. It is not a comprehensive overview of all findings from this research. For full findings of the learning partner research, read the Leaders in

Teaching Research and Policy Series, linked throughout and listed at the end of this paper.

Figure 1 – Overview of data collection activities carried out by the learning partners in 2019-20

Data collection completed in 14 districts of Rwanda in 2019-2020 for Leaders in Teaching

In 2019...

 **18** focus group discussions completed with **96** stakeholders

Publications drawing on these data:

- > What makes a 'good teacher' and constitutes 'quality teaching': practitioner perspectives from Rwandan secondary schools. (2021)
- > Teaching quality in secondary education in Rwanda: Evidence from STEM teachers. (2021)

In February-March 2020...

At all **358** schools...



Surveys completed of

350 + 1,820

school leaders

STEM teachers

At a subset of **101** schools...



Student and teacher assessments, as well as classroom observations, carried out in one S3 mathematics class per school for a total of

97 + 4,067

S3 mathematics teachers

S3 students

Publications drawing on these data:

- > Growing enrolment, static resources: Changes in school resources and infrastructure in relation to enrolment trends in Rwandan secondary schools. (2021)
- > School leadership and school quality in secondary education in Rwanda. (2021)
- > Understanding the drivers of numeracy assessment scores in Secondary 3 classes in 14 districts in Rwanda. (2021)
- > Video recordings of classroom observations: Using the Teach tool in Rwandan secondary schools. (2020)
- > Teacher practices in Rwandan secondary mathematics classrooms: Findings from classroom observations. (2021)
- > Using teacher assessments to understand teacher pedagogical knowledge in Rwanda. (2021)

In August 2020...



600 phone surveys completed of school leaders and teachers during school closures

Publications drawing on these data:

- > Effects of school closures on secondary school teachers and school leaders in Rwanda: Results from a phone survey. (2020)

Systemic factors associated with teaching quality in Rwandan secondary education

The learning partner research highlights several key systemic factors associated with teaching quality in Rwandan secondary education. These factors contribute to a baseline understanding of the context for secondary education and teaching quality in Rwanda, and are essential to consider in programming, research and policy decisions.

1. There is a strong association between the type of school a student attends and teaching and learning outcomes

Schools of excellence / boarding schools perform better on almost all student and teaching quality metrics compared to other schools.

What are schools of excellence?

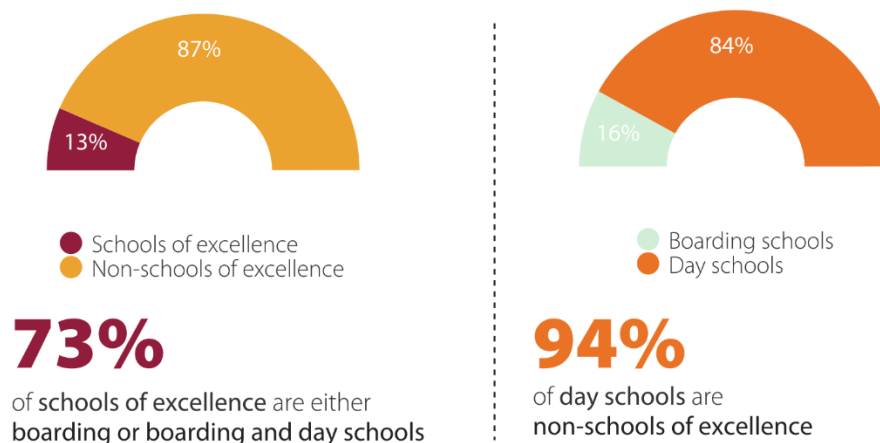
The Ministry of Education [established schools of excellence in 2011](#) to promote sciences with a focus on practical classes and act as models for other schools. By definition, schools of excellence have access to more and higher quality resources and infrastructure, including in terms of science and ICT facilities. These schools admit the top-performing students based on national examination results. Figure 2 shows the share of schools in the Leaders in Teaching sample that are schools of excellence and boarding schools. There is significant crossover between schools of excellence and boarding schools.

Figure 2 – Composition of 358 schools in the Leaders in Teaching sample

Composition of 358 schools in the Leaders in Teaching sample

91% of schools in our sample are located in rural areas

Two sets of school types are important to distinguish: schools of excellence/non-schools of excellence and boarding/day schools



Students at schools of excellence come from wealthier and more educated families and are likely to have repeated a grade fewer times. They perform substantially better on [numeracy assessment scores](#): 63% of the top 10% (based on their numeracy assessment score) of students in our sample are enrolled in boarding

schools. Schools of excellence and boarding schools are [significantly better equipped](#) than other schools: they are more likely to have facilities like science labs, libraries and smart rooms, as well as access to laptops and science kits. They also have more qualified and experienced STEM teachers and are more likely to be in urban areas.

Teachers in schools of excellence report the most positive [levels of satisfaction with school resources and materials](#), and indicate a higher level of overall motivation. Leaders of schools of excellence / boarding schools are older and more experienced in [school leadership](#). They report lower teacher absenteeism and lateness, meeting with teachers more frequently, and higher satisfaction with cooperation from parents. Teachers from schools of excellence also scored higher than those from other schools across most dimensions of teaching quality assessed in [classroom observations](#).

We know from student composition data that schools of excellence / boarding schools are less accessible to students from low-income backgrounds, as these students tend to perform worse academically due to various disadvantages. Students are required to complete national examinations at the end of primary school (Primary 6). The results of these examinations are used to place students into secondary schools. This student allocation mechanism leads to a high concentration of the best performing students in the best performing schools, namely schools of excellence / boarding schools (which make up just 13% of the schools in our sample).

When we remove schools of excellence / boarding schools from the sample, we see that which non-school of excellence / day school a student attends has little bearing on their [numeracy learning outcomes](#) at the start of the school year. We also find that day schools with better school inputs (e.g. resources, infrastructure, lower student/teacher ratios) only experience slightly better numeracy outcomes on average. This could be because of legacy learning gaps accumulated through primary education that hold students back when they reach secondary school. Disadvantaged students are more likely to build up these learning gaps for various reasons, some of which we explore in this paper.

Smaller schools² and those in rural areas have experienced the highest increases in enrolment, putting pressure on already limited resources. Between 2017 and early 2020, enrolment in secondary schools in our sample increased by 26% overall. In small, mostly rural schools, this rate was 49%, as many more students were able to access secondary education. This has resulted in a larger per capita gap in terms of resource availability between small, rural day schools – which lag when it comes to internet access, access to science labs, and availability of laptops – and larger, urban boarding schools.

2. There are structural equity issues in the secondary education system, particularly when it comes to gender

Gender gaps persist in all aspects of the secondary education system. There are far more male than female STEM teachers and school leaders across the country, a fact borne out in our research: [81% of school leaders](#) and 73% of STEM teachers in our sample are males. This is important to note in the context of the [Rwandan government's aim](#) to promote women's recruitment into teaching and encourage more female leadership in schools.

Gender gaps are also present in student enrolment numbers and numeracy assessment results. While girls outnumbered boys in lower secondary – there are 5 girls for every 4 boys - boys outperformed girls in [numeracy assessments](#). This pattern is not new in Rwandan secondary education: boys outperformed girls by 8% on numeracy assessments across all schools in Rwanda in 2017, with little variation in the size of the [gender gap](#) across different schools. Interestingly, the gender gap disappears in urban schools and schools of excellence, i.e. schools where students are from the wealthiest backgrounds and achieve the highest numeracy assessment scores. Bridging the gender gap in secondary education continues to be an important area of priority for the government, especially in rural areas and non-excellence schools.

Lower secondary school is the moment when the educational outcomes of girls start to worsen compared to boys. Up until this point, [girls perform better](#), with more girls making it to secondary and with [higher pass rates](#) at the national primary school leaving examination. [Girls also perform better](#) on markers that we would expect to be associated with better student performance, such as being punctual for classes, having repeated grades less often, and reading more at home compared to boys. While these factors may contribute to narrowing the gender gap, boys still outperformed girls on both numeracy and literacy assessments. We recognise that while we do not currently have the data to understand the root causes of the gender gap – for example, we do not have data on student absences - there are likely multiple factors contributing to this gap.

Students who are older than expected for their grade, especially those with learning difficulties, are at the greatest risk of [dropping out](#). Age is also a strong predictor of [numeracy assessment scores](#), with older students at a significant disadvantage. We found that older students are more likely to have accumulated delays in their educational trajectory, through a late start to their education, frequent repetition or periods of drop out and re-entry. Boys, students in rural areas, and students from lower-income backgrounds are more likely to be over-aged for their grade. This trend is not unique to Rwanda; it can be seen in schools across the globe.

Fully understanding these gaps and disadvantages will require researchers, implementers and policy-makers to more holistically examine the multiple drivers that limit access to education for students and teachers. These drivers include wealth, family background, school type, location, age, whether the teacher or student has a disability, and how these factors interact to reinforce inequalities for specific subgroups of teachers and students. Understanding these connections can help actors address the root causes of inequities in secondary teaching and learning.

3. COVID-19 is having an impact on learning continuity for teachers

In April 2020, the Ministry of Education of Rwanda issued a response plan to the COVID-19 outbreak. In their short- and long-term objectives, [the plan](#) aims to continue education provision for all students, while keeping the school community (i.e. students, teachers, and educational personnel) safe. The plan also aspires to build resilience for future contingencies.

School leaders and teachers continued to engage in continuous professional development during school closures, but technology was a barrier. Nearly half of head teachers and a third of teachers engaged in continuous professional development (CPD) between March and August 2020 while schools were closed – compared to 85% of school leaders and 57% of teachers who reported having received CPD in the 12 months preceding March 2020. 22% of male teachers reported having online experience during school closures compared to 9% of female teachers. Further, head teachers who received CPD during [school closures](#) were more likely to report supporting their teachers to engage in CPD. Prior online experience, access to computers and the internet are associated with the likelihood of engaging in CPD during school closures.

Efforts to ensure continuity to education during the pandemic have been inspiring, but ensuring equal access to IT and blended learning remains a challenge. Government, Leaders in Teaching implementing partners and other stakeholders in Rwanda’s education system [rapidly pivoted their activities](#) to provide continuity to education and CPD during school closures and increase. These critical efforts were rolled out with impressive speed. However, implementing partners were quick to note that not all teachers and students can access blended learning – and those [already at a disadvantage](#) are most likely to be left behind.

4. The structure of Rwanda’s education system is changing

In the short term, emerging evidence indicates that COVID-related school closures will lead to an increase in enrolment in key transition grades (Primary 1, Secondary 1 and Secondary 4), putting teaching and school resources under

strain in those grades. Due to school closures resulting from COVID-19 and the [shift of the academic year](#), students were effectively required to repeat the grade they were in prior to school closures. As a result, we [expect a double cohort](#) of Primary 1 students in 2021 as new children became old enough to start school, while students who were already in Primary 1 repeat the grade. [Early indications](#) from our research in 2021 also point to an increase in enrolment in the transition points from primary to secondary school (Secondary 1) and from lower to upper secondary school (Secondary 4). This increase could be explained by students who had dropped out prior to school closures re-entering the education system. The spikes in enrolment in these grades will impact the structure of Rwanda's education system – in terms of enrolment by grade – for years to come.

In the long term, we expect increased student dropout and learning losses at the secondary level due to COVID-related school closures. After an early surge in enrolment in 2021, [we expect secondary enrolment to stagnate](#) for the next four years due to increased dropout in the transitions from primary to secondary and from lower to upper secondary. Higher dropout rates would be the result of the increased age of the student population and the effects of COVID-19 on the socio-economic situation of their households. This would reverse trends we had been expecting prior to COVID-19, namely an increase in secondary enrolment, and primary enrolment stagnating.

5. Understanding teaching quality in the Rwandan context will help identify areas where support can be targeted

Teachers highlighted several attributes - such as passion, punctuality, having cultural values, being a good role model and being motivated - as central to their understanding of [what makes a good teacher](#). Ten measures of [teaching quality](#) emerged based on input from Rwandan teachers and education stakeholders, which can be summarised in two components: cultural values and pedagogy; and motivation. The finding that Rwandan teachers consider cultural values an important component of teaching quality represents a brand new finding that can be incorporated into the way teachers are assessed.

Higher student outcomes are associated with head teachers allocating their time [across a range of tasks](#), rather than focusing primarily on administrative and leadership functions. Focusing on a variety of tasks - including curriculum- and teaching-related matters, meeting with and providing CPD to teachers, and developing quality interactions with parents, as well as administrative and leadership aspects - was associated with higher STEM passing rates of students. Our research also indicated that female school leaders provided CPD to teachers less frequently than male school leaders. It is important to note that these links are associations only and do not constitute causal relationships. We do not know the direction of causation or

whether there are factors outside the scope of our study that may cause this association. We seek to identify any causal patterns when more data on students' achievement and school processes have been collected.

Rwandan secondary mathematics teachers demonstrated strengths in using their time effectively, promoting a supportive classroom environment, setting positive behavioural expectations and facilitating lessons. We used an [adapted version of the World Bank's *Teach* tool](#) to carry out [classroom observations](#) in 101 Rwandan secondary mathematics classrooms. We found that almost all (96%) teachers used their time constructively by providing students with learning activities, and 82% of students were found to be on-task during these activities. 95% of teachers were found to set clear behavioural expectations for their students.

Teachers might benefit from support in their feedback practices, the use of positive language in the classroom, and strategies to enhance students' socioemotional skills. 61% of teachers provided comments or prompts throughout their lessons to help students when they had misunderstandings, but 98% of teachers did not identify student successes during learning activities or positively acknowledge when students were well behaved. Making students aware of their successes can help develop interest in a subject, confidence, self-regulatory skills and motivation to do well on further tasks.

Students were given meaningful roles and volunteered to participate, but most teachers (89%) did not give their students choices during lessons. Providing students with choices can foster engagement in learning and decision making. It is also particularly relevant for adolescent pupils, given their increased independence during secondary school. Female teachers achieved higher scores than male teachers in supporting student autonomy, particularly through their encouragement of student voluntary participation in the classroom. This finding suggests that female teachers may be more effective at encouraging student independence in the classroom.

We found limited evidence of teachers supporting student perseverance with challenges in the classroom: 99% of teachers did not acknowledge student efforts throughout lessons. Promoting student effort and encouraging learning from mistakes can enhance student motivation, achievement and creativity in learning.

Research using the World Bank's *Teach* tool also revealed that [female teachers had significantly higher scores](#) for the element of the instrument related to supporting student autonomy, namely, students being given choices and meaningful roles, and students volunteering to participate.

Implications for policy, programming and future research

Structural equity issues in the education system should be addressed

Multiple intersecting factors affect teaching and learning quality in Rwandan secondary education. It is important to remember that not all teachers and students are affected in the same ways.

- Small, rural schools and non-schools of excellence are most likely to lag behind or have resource shortages. While Leaders in Teaching focuses mainly on these schools, this finding has implications for broader investment priorities and could help minimise inequities in access to school-level resources – and potentially help narrow learning gaps.
- Leaders in Teaching should continue to focus on programmes to attract, retain and support female teachers, with many implementing partners already giving careful consideration to issues of gender in their programming. At the student level, gender-sensitive pedagogies for STEM might help girls to maximise their potential.
- Similarly, exploring pathways for female teachers to become school leaders will be important for equity because currently, only one in every five school leaders is a woman. Supporting school leaders is critical as we observed that head teachers' interactions with teachers beyond administrative tasks positively correlates with students' outcomes.
- Our findings suggest that legacy learning gaps are holding some students back. This reinforces the fact that a continued focus on improving the quality of primary education (and addressing equity challenges at this level) is going to be critical to improve learning outcomes for all at the secondary level.
- A deeper understanding of the ways in which the different drivers of disadvantage – such as wealth, gender, family background, or disability - intersect for different groups of teachers and learners will be important in helping implementing partners plan and deliver more holistic, inclusive programmes. Access to technology and training on teaching and learning with technology seems critical for school leaders' engagement and promotion of CPD. Such support should consider existing limitations to access technology for learning amongst students and communities.

COVID-19 has changed the education landscape for the long-term

COVID-19 will affect the education system for some time, and it will be essential to continue work on future-proof education programs and systems to meet these challenges.

- This may include changes in resource allocation priorities by focusing on grades with increased enrolment where dropout is more likely (for example,

Secondary 1 and Secondary 4); an increase in the urgency to train new teachers in these grades; finding new educational or vocational solutions for youth who are at risk of dropping out due to COVID-19, particularly over-aged youth; and continuing the ongoing shift to blended learning with a focus on ensuring female and male teachers are equally comfortable with online learning.

- The focus on blended learning is essential, but should not come at the expense of improving fundamentals in the education system. It will also be important to continue ongoing efforts to ensure that teachers and students already at a disadvantage are not left further behind by this shift.

A context-specific understanding of teaching quality and practices is important, and more research is needed in this area

- Incorporating new components of teaching quality – such as cultural values and pedagogy, and motivation components - into assessment frameworks could help further align teacher and government expectations of teaching quality.

Understanding teachers' perceptions of teaching quality and teacher and head teacher practices provides indications of where teachers might benefit from training and support. For example, teachers might benefit from support in their feedback practices, use of positive language in the classroom, and support of students' socioemotional skills. Male teachers in particular may benefit from training on ways to encourage students' autonomy in the classroom.

Full list of learning partner publications stemming from 2019-20 data collection

School resources

- > [Growing enrolment, static resources: Changes in school resources and infrastructure in relation to enrolment trends in Rwandan secondary schools.](#) (2021)

School leadership

- > [School leadership and school quality in secondary education in Rwanda.](#) (2021)
- > [Effects of school closures on secondary school teachers and school leaders in Rwanda: Results from a phone survey.](#) (2020)

Classroom practices

- > [Video recordings of classroom observations: Using the Teach tool in Rwandan secondary schools.](#) (2020)
- > [Teacher practices in Rwandan secondary mathematics classrooms: Findings from classroom observations.](#) (2021)
- > [Using teacher assessments to understand teacher pedagogical knowledge in Rwanda.](#) (2021)

Student outcomes

- > [Understanding the drivers of numeracy assessment scores in Secondary 3 classes in 14 districts in Rwanda.](#) (2021)

Understanding teaching quality

- > [What makes a 'good teacher' and constitutes 'quality teaching': practitioner perspectives from Rwandan secondary schools.](#) (2021)
- > [Teaching quality in secondary education in Rwanda: Evidence from STEM teachers.](#) (2021)

Background papers

Background papers on leadership, training and gender

- > [Leadership development in secondary school teachers in Rwanda: Evidence from a census of Rwandan secondary schools.](#) (2020)
- > [Continuous professional development of secondary school teachers in Rwanda: Evidence from a census of Rwandan secondary schools.](#) (2020)
- > [Gender gap in secondary schools in Rwanda: Evidence from national student assessments.](#) (2021)

Learning webinar summaries

- > [Improving teaching quality in Rwanda in the context of COVID-19: challenges and opportunities.](#) (2020)
- > [Situating equity in the context of secondary teaching and learning in Rwanda.](#) (2020)
- > [What does "the new normal" mean for teaching and learning quality in Rwandan secondary education?](#) (2021)

¹ The 14 Leaders in Teaching districts are: Musanze, Gicumbi, Kayonza, Rwamagana, Nyabihu, Ngororero, Rusizi, Nyamasheke, Karongi, Rubavu, Gisagara, Nyaruguru, Nyanza, and Kamonyi.

² We define small schools as those with less than 300 students.




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