MEASURING THE IMPACT OF COVID-19 ON LEARNING IN RURAL KENYA
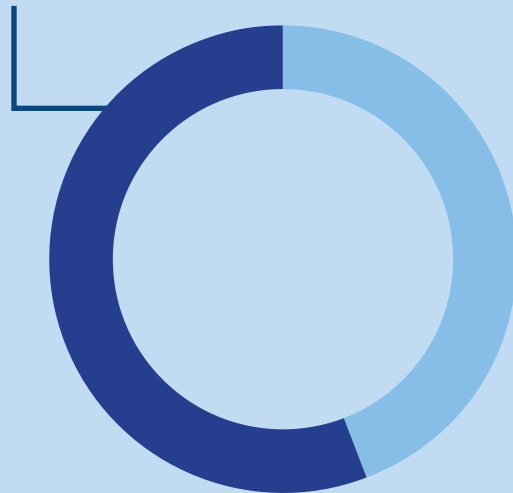
whizz
EDUCATION

EXECUTIVE SUMMARY

From a sample of 965 students in rural Kenya, who participated in Project iMlango and had a reliable Maths Age in March 2020 (when schools closed due to COVID-19) and were reassessed in the 2020-21 academic year:

- **53% of students exhibited declines in their levels of maths knowledge ('Maths Age')**

- **The average loss among those students was 1.1 years, or 13 months**

- **Losses were observed across the maths curriculum and were most pronounced in topics rooted in core calculational procedures**

- **Grade level is a predictor of learning loss, with a greater proportion of students in lower grade levels affected. This is most likely because these students have a smaller pool of core knowledge to draw on and are therefore more vulnerable to erosion of previously acquired knowledge.**

- **A greater proportion of students from reportedly 'hardship' areas experienced learning loss, although their average losses were in line with students from 'rural' and 'urban' areas**

This study extends findings observed in the UK and US, with a greater proportion of students experiencing learning loss, and to a greater extent on average. The findings are largely explained by the limited learning provision for these communities during COVID-19. Students in rural Kenya who were already lagging several years behind their affluent peers in Kenya and worldwide are now at a further disadvantage, with knowledge gaps exacerbated across the maths curriculum.

53% OF STUDENTS EXHIBITED DECLINES IN 'MATHS AGE'

1. BACKGROUND AND METHODOLOGY

Nationwide school closures were introduced to Kenya on March 20 2020, leading to several months of lost learning potential as students lacked access to structured learning support at home. Students received negligible access to Maths-Whizz virtual tutoring during this time. Furthermore, most households did not have connectivity and/or an internet-enabled device. Radio and televised home learning was made available at the national level, though was not widely accessible. In addition, iMlango disseminated worksheets to teachers via WhatsApp groups covering all project communities, but penetration of this activity was similarly inhibited by access issues. The stark reality is that students lacked structured and sustained support with their learning during the first phase of COVID-19.

While students have returned to school in recent months, it is posited that many have experienced a decline in their knowledge levels as previously acquired knowledge has eroded. The purpose of this study is to measure the extent to which the disruptions brought about by the first wave of COVID-19 have impacted on students' knowledge levels in mathematics for students in rural Kenya.

MATHS AGE

Students' knowledge levels in mathematics are measured in terms of Maths Age, Whizz Education's international benchmark for attainment. Maths Age is a criterion-referenced metric with a natural interpretation: a student with a Maths Age of 9 has the maths knowledge expected of a nine-year-old.

When students undertake a diagnostic assessment on Maths-Whizz, they receive a Maths Age across several topics, as well as an overall Maths Age (the mean of those topics). As students interact with the Maths-Whizz virtual tutor, their Maths Age is continually updated from lesson to lesson.

SAMPLE

Among the approximately 80,000 students who participated in Project iMlango, we have filtered on the following requirements:

1. **The student was active on the Maths-Whizz tutoring platform for at least 30 minutes/week between their initial assessment and March 20 2020. This ensures that the Maths Age recorded for those students on March 20 2020 (our baseline) is a reliable indicator of their maths knowledge at that time.**

2. **Students have undertaken a reassessment on Maths-Whizz in the period Oct 12 2020 - Mar 17 2021. Thus an up-to-date snapshot of those students' knowledge levels at the point where they returned to school, as indicated by their reassessed Maths Age, is also available. There is variation in when students returned and were reassessed, therefore some may have benefited from a small degree of in-school learning this academic year prior to their reassessment.**

965 students from 88 schools met these requirements and form the basis of analysis

Since the students meeting the requirements of our analysis were necessarily those with consistent activity on the virtual tutor prior to school closures, there is some selection bias in the sample. These 965 students are not representative of general Maths-Whizz usage patterns within iMlango. In particular, their levels of activity should be considered exceptional since they managed to maintain consistent usage up until March 2020, despite the prevalent contextual challenges. Our estimates concerning the degree of learning loss should be interpreted within this context.

2. OVERALL MEASURE OF LEARNING LOSS

O ur sample of 965 students showed an average Maths Age of 9.28 on March 20 2020 and 8.98 at reassessment, pointing to an overall average learning loss in excess of 3.5 months. (It is worth noting that these students were on average 3 - 4 years behind their international peers to begin with.)

514 students (53%) exhibited learning loss in this period, as indicated by a decline in their Maths Age. Those students exhibited an average loss of 1.1 years, or just over thirteen months.

Since Maths-Whizz assesses students on a per-topic basis, these losses can be analysed at the topic level:
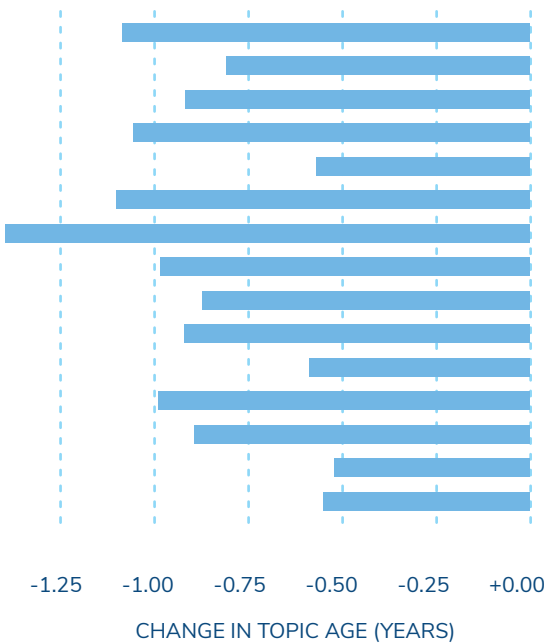
OVERALL
PLACE VALUE
PROPERTIES OF NUMBERS
FRACTIONS
DECIMALS
MENTAL CALCULATIONS: + & -
PENCIL & PAPER - ADDITION
PENCIL & PAPER - SUBTRACTION
MENTAL CALCULATION: X & /
PENCIL & PAPER - MULTIPLICATION
MEASURES
PERCENTAGES & RATIO
INTEGERS, POWERS & ROOTS
EQUATIONS, FORMULAE & IDENTITIES

CHANGE IN TOPIC AGE (YEARS)

FIGURE 1: LEARNING LOSS BY TOPIC BETWEEN MAR 2020 AND THE 2020-21 ACADEMIC YEAR

Learning loss is thus a curriculum-wide phenomenon in mathematics. The topics showing the steepest losses are those containing formal calculation methods, which are a foundational layer of the maths curriculum and require regular practice and consolidation in order for students to become fluent.

47% of students showed an improvement in Maths Age, with an average gain of 0.62 years. This is close to the annual rates of learning (0.58 years of a standard maths curriculum) established at the baseline of Project iMlango.[1] During that project we observed more than a doubling of learning rates for students who enjoyed sustained access to Maths-Whizz virtual tutoring. This suggests that, on average, even those students in rural Kenya least affected by COVID-19 were only able to achieve rates of learning seen prior to intervention. It is worth noting again, however, that these students had no access to school during this period, so gains of any kind must be accounted for as a subject for further research. We can speculate that these students may have received proportionately higher levels of access to learning content in the forms described earlier (both during and - to a small degree - after school closures), and that their prior exposure to virtual tutoring helped embed core knowledge that was thus retained during this period. As mentioned above, there was also a natural bias to the selection which meant that the sample comprised, by default, those students who exhibited consistent usage throughout the project, and therefore might be assumed to be more proactive or resilient in the face of learning disruptions, or better supported with learning at home. In the absence of individualised tutoring during the first wave of the pandemic, however, even these students regressed to rates of learning that are well below their affluent peers, both in Kenya and worldwide.

[1] https://www.whizzeducation.com/wp-content/uploads/Data-to-Insight-to-Action-White-Paper-Whizz-Education-1.pdf

3. LEARNING LOSS BY SEGMENT

This section takes a closer look at the extent to which different groups of students have exhibited learning loss during COVID-19. The charts that follow focus on the percentage of students exhibiting learning loss within each segment, as well as the average loss among those students who exhibited learning loss.
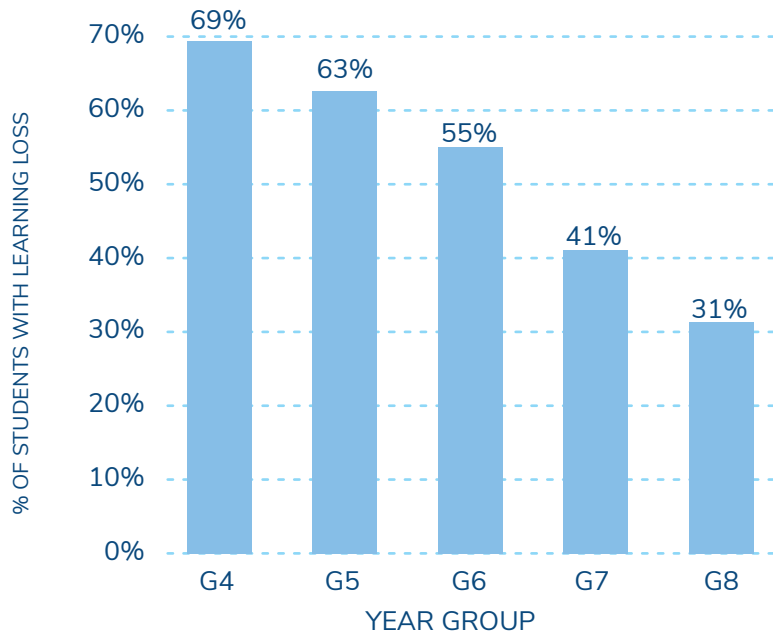
GRADE LEVEL

A higher proportion of students exhibited learning loss in the lower grades; in fact there is a clear downward trend from G4 to G8. This is likely because those students have a smaller pool of core subject knowledge to draw on, which means their previously acquired knowledge is harder to retain.
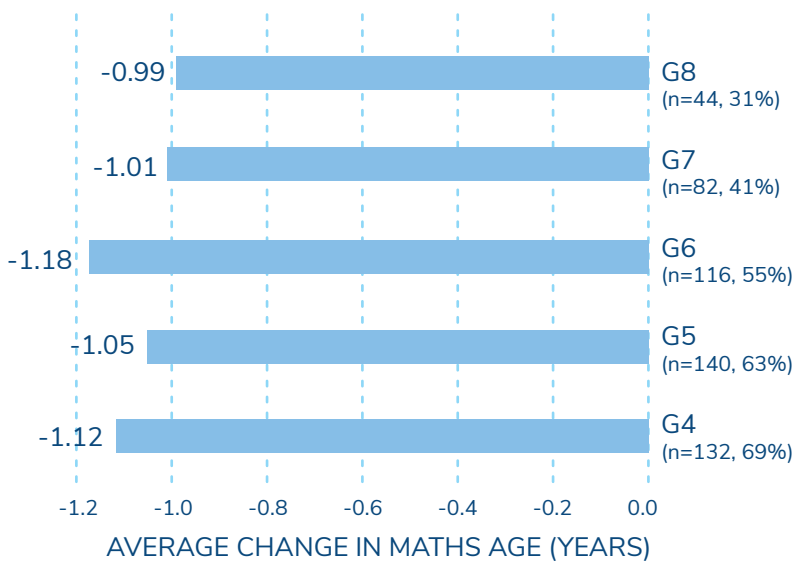
FIGURE 2: PERCENTAGE OF STUDENTS WHO EXPERIENCED LEARNING LOSS BY GRADE LEVEL

The amount of learning loss suffered by students in each grade shows some variation, with G6 students impacted the most.

FIGURE 3: AVERAGE LEARNING LOSS BY GRADE LEVEL FOR STUDENTS WHO EXPERIENCED LEARNING LOSS

GENDER

A slightly higher proportion of boys exhibited learning loss compared to girls (55% vs 50%), but losses were more pronounced for girls (1.18 years vs 1.04 years; a difference of almost 7 weeks of learning).
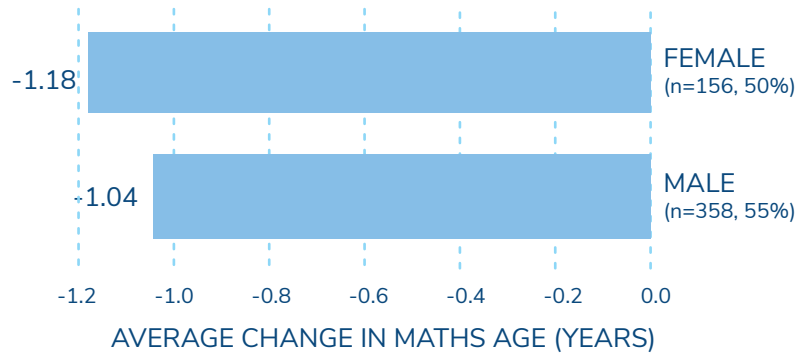

FIGURE 4: AVERAGE LEARNING LOSS BY GENDER FOR STUDENTS WHO EXPERIENCED LEARNING LOSS

SCHOOL TYPE

Our sample includes students from schools marked as either urban, rural or hardship (so labelled because these are schools more prone to insecurity, poor transport, famine, hunger, aridity , flooding and extreme living conditions compared to the other rural schools). As might be expected, a higher proportion of students in hardship schools exhibited learning loss compared to students in rural school who, in turn, were more likely to experience learning loss than students in urban schools.
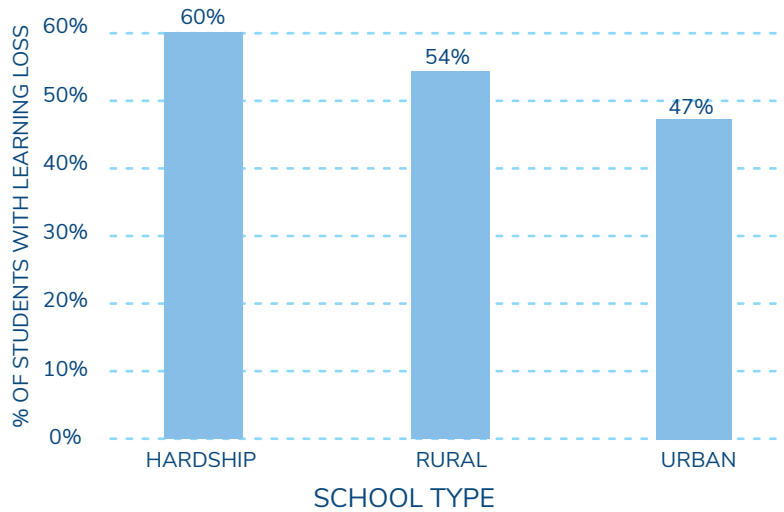

FIGURE 5: PERCENTAGE OF STUDENTS WHO EXPERIENCED LEARNING LOSS BY SCHOOL TYPE

The extent of learning loss, among those students affected, was at similar levels across these groups, with rural students seeing slightly more extreme losses.
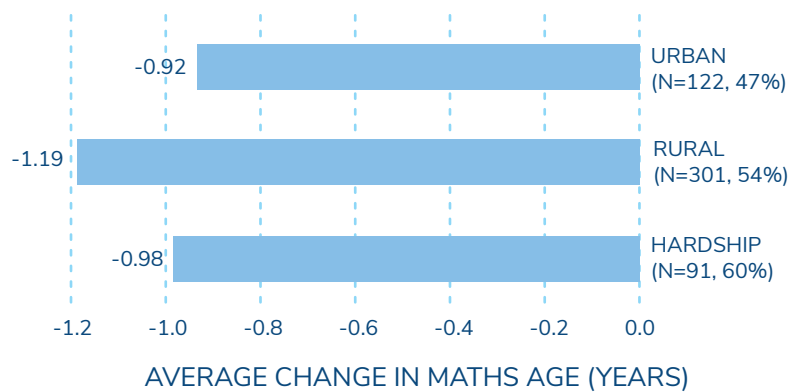

FIGURE 6: AVERAGE LEARNING LOSS BY SCHOOL TYPE FOR STUDENTS WHO EXPERIENCED LEARNING LOSS
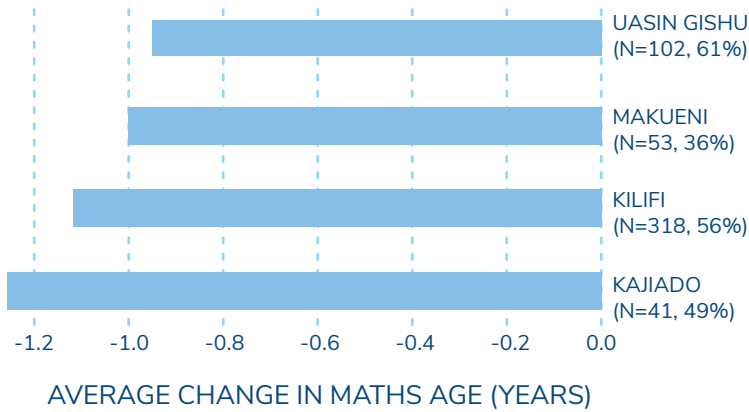
COUNTY

AVERAGE CHANGE IN MATHS AGE (YEARS)

FIGURE 7: AVERAGE LEARNING LOSS BY SCHOOL TYPE FOR STUDENTS WHO EXPERIENCED LEARNING LOSS

Of the four counties from which students were sampled, Uasin Gishu showed the highest proportion of learning loss students (61%), while the losses were most pronounced in Kajiado (1.26 years; a full three months of learning more than Uasin Gishu). Only 36% of students in Makueni showed learning loss, significantly lower than the sample-wide figure of 53%. Students in Kilifi and Kajiado counties are more disadvantaged and face relatively more challenges like lack of water, hostile living conditions, persistent harsh climatic conditions like drought and flooding, unavailability or inaccessibility to food, inadequate transport and communication network. These occur with less frequency in Uasin Gishu and Makueni counties.

4. CURRENT OVERALL KNOWLEDGE LEVELS

To underscore the extent of the challenge involved in recovering learning losses and ensuring students from marginalised communities can progress through the curriculum, we have measured the average knowledge levels by topic for the 6,889 who were reassessed on Maths-Whizz in total between October 12 2020 and March 17 2021.

Maths Delta is simply the difference between a student's Maths Age and their chronological age; a negative Delta thus means students are below expected knowledge levels.
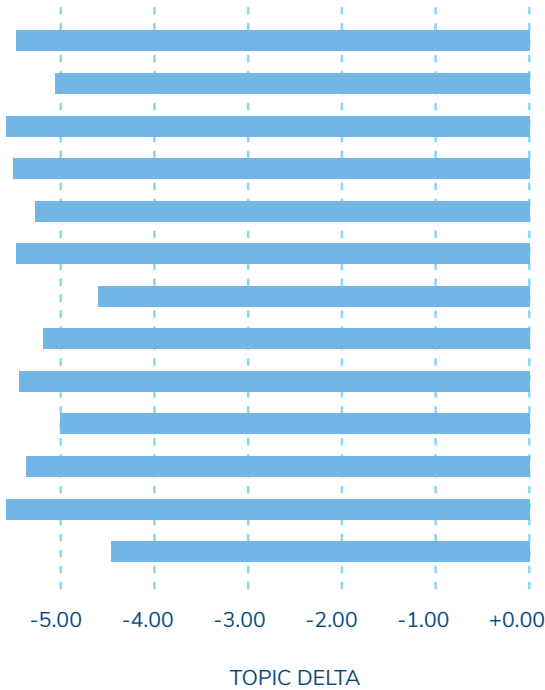
OVERALL
PLACE VALUE
PROPERTIES OF NUMBERS
FRACTIONS
DECIMALS
MENTAL CALCULATIONS: + & -
PENCIL & PAPER - ADDITION
PENCIL & PAPER - SUBTRACTION
MENTAL CALCULATION: X & /
PENCIL & PAPER - MULTIPLICATION
MEASURES
PERCENTAGES & RATIO
INTEGERS, POWERS & ROOTS
EQUATIONS, FORMULAE & IDENTITIES

-5.00   -4.00   -3.00   -2.00   -1.00   +0.00

TOPIC DELTA

FIGURE 8: MATHS DELTA BY TOPIC

We can see a negative Delta across the maths curriculum. This trend predates COVID-19 but has been exacerbated by the fact that students have had limited opportunities to progress through the curriculum this past year and, as the previous sections detail, many have even slipped further behind in the curriculum. Overall, students are now more than five years behind their expected levels.

5. DISCUSSION

A previous study[2] carried out by Whizz Education showed that learning loss was evident in the UK and US, as a result of the 2020 lockdown that brought about school closures and other disruptions to learning. That study found that 46% of UK/US students exhibited learning loss between March 2020 and the new academic year, with an average loss of eight months.

The findings of this study extend the narrative of learning loss by showing that a greater proportion of students in rural Kenya have experienced COVID-induced learning losses, and to a significantly greater extent. While students in the developed North were largely able to access regular online learning during the first phase of COVID-19, the opposite was true in rural Kenya. Only a fortunate few accessed the iMlango portal while schools were closed. Very few households have laptops or internet connectivity, while power outages are common. In this context, the findings - as staggering as they are - are to be expected.

A subplot of the learning loss narrative is that losses are not uniformly distributed. Our segmentation analysis shows that grade level is a predictor of learning loss, with lower grade levels experiencing the highest proportion of students with losses. Students in 'hardship' areas are also significantly more likely to have exhibited learning loss. Gender does not appear to be a major predictor of learning loss, with both boys and girls suffering the brunt of COVID-induced school disruptions. A topic for further research is the examination of enabling factors for those students who, despite school closures, secured knowledge gains during the period. The range of learning materials available through formal and informal channels, and the strength of their prior knowledge as a result of their engagement with virtual tutoring, are speculated as possible such factors.

The learning loss wrought by COVID-19 amplifies the need for accelerated learning. Even prior to the pandemic, it was known that students in rural Kenya lagged several years behind their affluent peers. Those gaps have sadly widened, but by targeting our analysis at the level of individual topics, we have identified curriculum areas of focus for recovery programmes.

The learning loss wrought by COVID-19 amplifies the need for accelerated learning.

[2] *https://www.whizzeducation.com/wp-content/uploads/Lockdown-loss.pdf*

CONTACT US

UNITED KINGDOM

Whizz Education Ltd
Macmillan House
Platform 1, Paddington Station
London, W2 1FT
United Kingdom

Tel: +44 (0) 203 328 6564
Email: support@whizz.com

USA

Whizz Education, Inc.
PO Box 3060,
Roanoke, VA. 24015,
United States

support@whizz.com

KENYA

Whizz Education
Karen Office Park,
Hemingways Building
PO Box 2101-00502
Nairobi
Kenya

+254 734 774 972
kenya@whizzeducation.com

UAE

Whizz Education
Office EO-17, 3rd Floor
Building 12
Dubai International Academic City
PO Box 98427
Dubai, UAE

Tel: +971 4 454 8340
Email: support@whizz.com

OUR AGENTS

NEW ZEALAND

iLearn Interactive
PO Box 200
Mangawhai, 0540
New Zealand

Tel: +64 9 431 4466
Email: info@ilearn.co.nz

THAILAND

Nanmee Books
11 Soi Sukhumvit 31 (Sawasdee)
Sukhumvit Road, Klongtoey Nua
Wattana, Bangkok, 10110
Thailand

Tel:+66 (0) 2662 3000
Email: mathswhizz@nanmeebooks.com