COVID-19 in Sub-Saharan Africa:
Monitoring Impacts on Learning Outcomes

SENEGAL REPORT

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ACER	Australian Council for Educational Research
AMPL	Assessments for Minimum Proficiency Levels
CONFEMEN	The Conference of Ministers of Education of French-Speaking Countries
DFAT	Department of Foreign Affairs and Trade
GEM	Global Education Monitoring
GPE	Global Partnership for Education
MILO	Monitoring Impacts on Learning Outcomes
MPL	Minimum Proficiency Level
OECD	Organisation for Economic Co-operation and Development
PASEC	Programme for the Analysis of Educational Systems
PIRLS	Progress in International Reading Literacy Study
PISA	Programme for International Student Assessment
REDS	Responses to Educational Disruption Survey
SDG	Sustainable Development Goal
UIS	UNESCO Institute for Statistics
UNESCO	The United Nations Educational, Scientific and Cultural Organization

Introduction

Six African countries participated in the COVID-19: Monitoring Impacts on Learning Outcomes (MILO) project in 2021 – Burkina Faso, Burundi, Côte d'Ivoire, Kenya, Senegal and Zambia. This report presents the key findings from the MILO project for Senegal. The cross-national findings from all six participating countries are provided in the MILO Main Report (UIS & ACER, 2022).

The MILO study was designed to provide information on the impact of the pandemic on learning outcomes. As countries work towards achieving Sustainable Development Goal (SDG) 4.1.1b,[1] it is essential that progress towards this goal continues to be monitored. The MILO project was implemented to provide a way for countries to measure learning progress against SDG 4.1.1b prior to, during and after the pandemic.

The four overarching goals of the MILO project were to:

- evaluate the impact of COVID-19 on reading and mathematics learning outcomes by reporting against SDG indicator 4.1.1b
- identify the impact of different distance learning mechanisms put in place to remediate the learning disruption caused by COVID-19
- expand the UIS bank of items for primary education assessments
- generate a toolkit to scale assessment results to international benchmarks, reporting against SDG 4.1.1.b.

The MILO study is a UNESCO Institute for Statistics (UIS) project and was funded by the Global Partnership for Education (GPE). The Australian Council for Educational Research (ACER) was the technical partner. Technical and implementation support was provided by The Conference of Ministers of Education of French-Speaking Countries (CONFEMEN), to the four francophone countries (Burkina Faso, Burundi, Côte d'Ivoire and Senegal). A National Centre was responsible for implementing the project within each country. In the case of Senegal, the MILO project was implemented by the Ministry of Education.

Study design

The MILO project used Assessments for Minimum Proficiency Levels (AMPL-b) to estimate learning outcomes in reading and mathematics at the end of primary schooling. These learning outcomes were reported as the proportion of students in the target grade who met the minimum proficiency levels (MPLs) referred to in SDG 4.1.1b:

[1] The proportion of children and young learners … at the end of primary … achieving at least a minimum proficiency level in (i) reading and (ii) mathematics, by sex. (United Nations, 2015)

> The proportion of children and young learners … at the end of primary … achieving at least a minimum proficiency level in (i) reading and (ii) mathematics, by sex. (United Nations, 2015)

In Senegal, the AMPLs were administered in French to a representative sample of Grade 6 students in schools from 7 June to 11 June 2021. The results of these assessments were compared with historical assessment data collected from an equivalent student cohort prior to the COVID-19 outbreak. The historical assessment was the Programme for Analysis of Educational Systems (PASEC) 2019 (CONFEMEN, 2020). This comparison enabled the impact of the pandemic on learning outcomes to be quantified.

To assist in the interpretation of the assessment results, contextual data were collected through questionnaires:

- a Student Questionnaire – given to the same students who completed the AMPL tests)
- a School Questionnaire – completed by school principals or their delegates
- a System Questionnaire – completed by respondents at the national level.

The questionnaires focused on the main COVID-19 disruption period, as identified by each country on the basis of when there was the most disruption to education. Senegal identified mid-March to late May 2020 as their main COVID-19 disruption period.

Report outline

In this report on the MILO results for Senegal, sampling outcomes are first provided, including a comparison of key characteristics of the Senegal populations participating in 2019 and 2021 assessments. Next, the learning outcomes in reading and mathematics are presented for Senegal, for boys, girls and for all participants. This report provides the achievement outcomes by explicit strata, showing achievement results by sub-region. Subsequently, the contexts of learning during the COVID-19 pandemic are first presented, including at the national education system level, school level and student level. Finally, the report concludes with a discussion of the outcomes and recommendations for strengthening the resilience of the education system.

The MILO Main Report (UIS & ACER, 2022) complements this Senegal report. It provides more detail on the MILO project background and instruments and provides the cognitive and contextual results for all six countries that participated in the MILO project.

Sampling outcomes

The Senegal school participation rate in the MILO study was extremely high. There were 247 schools that participated, with a 99 per cent response rate. Similarly, there was a very high student response rate. There were 4,675 students who undertook the

assessment, with a 98 per cent response rate. Hence, the overall participation rate was 97 per cent.[2]

To ensure that achievement results between the AMPL 2021 and PASEC 2019 were comparable, it was important that the two populations had similar characteristics. Comparative data based on the following categorical variables for both populations can be seen in Table 1. These variables were family wealth, gender, age, maternal and paternal literacy and school type. The characteristics of the population were similar across the two assessments, with some differences. The most prominent was the proportions of girls and boys, with 8 percentage points more girls participating in AMPL than PASEC 2019.

Table 1: Senegal student and home background characteristics of historical 2019 assessment and AMPL 2021

	AMPL 2021	PASEC 2019	Difference (AMPL 2021-PASEC 2019)
AMPL–National assessment wealth index (logits)	0.28	-0.20	0.48
Gender (% girls)	54%	46%	8%
Age (years)	14.8	14.5	0.3
Maternal literacy	56%	60%	-4%
Paternal literacy	78%	77%	1%
School type (% public)	87%	91%	-4%

Learning outcomes

To measure the impact of the COVID-19 disruption on learning outcomes, the reading and mathematics achievement results in 2021 were compared to those from 2019. Achievement results in reading and mathematics are reported in terms of the percentages of students who reached or exceeded the MPLs for upper primary for girls and boys, as well as overall.

A standard-setting exercise was conducted to establish the MPLs for students at the end of primary schooling. This determined the score in the AMPL associated with the minimum level of skill or knowledge required to meet the MPL for SDG 4.1.1b. Appendix A of the MILO Main Report (UIS & ACER, 2022) provides further details on how the MPL was established.

The percentages of students from Senegal who met or exceeded the reading and mathematics MPLs in 2021 is shown in Table 2. The table also shows the percentages of students who met or exceeded the MPLs in 2019. For all students there was no statistically significant difference in the proportion of students who met the MPL for reading and mathematics between 2019 and 2021. However, it is notable that in both

[2] The response rates are unweighted including substitutes.

2021 and 2019, there is a greater proportion of students meeting the MPL for mathematics than reading.

Table 2: Proportions of students who met or exceeded MPLs for reading and mathematics, AMPL and historical assessments, by gender, and percentage point difference for Senegal

Learning domain	2021 AMPL Students who reached or exceeded MPLs (%)			2019 PASEC Students who reached or exceeded MPLs (%)			Percentage point differences 2021 AMPL - 2019 PASEC		
	All	Boys	Girls	All	Boys	Girls	All	Boys	Girls
Reading MPL	13.3	11.6	14.6	14.7	14.1	15.2	-1.4^	-2.5^	-0.6^
Mathematics MPL	34.0	34.1	33.9	34.6	34.6	34.7	-0.6^	-0.5^	-0.7^

^ No statistically significant difference between AMPL and historical assessment

The learning outcomes were not homogeneous across the different regions of Senegal. As can be seen in Table 3, the Dakar region of Senegal – which is also the capital city – had the highest proportion of students who reached or exceeded the MPLs in both reading (39.6%) and mathematics (61.1%). This is consistent with literature showing that across many countries urban areas generally outperform rural areas on learning assessments (Echazarra & Radinger, 2019). Dakar is the most populous and urbanised region of Senegal (Central Intelligence Agency, 2021).

Table 3: Proportion of students who reached or exceeded reading and mathematics MPL by region in Senegal

Region	Reading AMPL 2021 Students who reached or exceeded MPLs (%)	Mathematics AMPL 2021 Students who reached or exceeded MPLs (%)
Dakar	39.6	61.1
Diourbel	4.6	29.3
Fatick	4.5	22.8
Kaffrine	3.0	35.2
Kaolack	15.4	42.0
Kédougou	5.7	8.4
Kolda	2.0	10.7
Louga	6.1	28.7
Matam	7.1	19.3
Pikine and Guédiawaye	24.5	59.3
Rufisque	17.8	49.2
Saint-Louis	7.0	29.1
Sédhiou	4.7	12.4
Tamba	3.2	8.8
Thiès	14.6	38.1
Ziguinchor	8.3	7.0
Senegal	13.3	34.0

Contexts of learning during the COVID-19 pandemic

National contexts

The MILO System Questionnaire was completed by a senior government official nominated by the National Centre who provided information about the education policies and programs implemented in Senegal. This information was complemented by other sources from publicly available literature on the impact of COVID-19 on schooling in Senegal. School closures, remote education and modified schooling are two policy areas of particular relevance to learning during the COVID-19 disruption.

Schools in Senegal were closed in mid-March 2020. Schooling was resumed for examination classes in all schools in late June 2020, to enable learners to undertake exams in September 2020. To facilitate social distancing, other grades did not resume schooling until early to mid-November, 2020.

Whilst schools were closed, students were expected to engage in remote learning, through the 'Learning at home' initiative. A focus of this program was to maintain students' connection to school and to prepare them for returning to school. Television and radio technologies were used for remote learning (UIS, 2020).

When schooling resumed, adapted health and safety protocols were mandated. This included greater teacher support for students made possible via smaller class sizes.

School and classroom contexts

Principals in Senegal were asked to indicate how the pandemic affected schooling, teaching and learning. This section describes the proportion of students who attended schools where the principal reported issues related to operational circumstances during COVID-19, the limitations to providing remote instruction and strategies to overcome these limitations, student health and wellbeing, and returning to school. For example, when asked about the COVID-19 disruption, 50 per cent of students attended schools where the principal indicated the school continued to provide access for specific grade levels.

Operational circumstances during COVID-19

Despite school closures during the COVID-19 disruption period, specific groups of students in Senegal still had access to school buildings. These groups were:

- students from selected grade levels (50%)
- students with special needs (30%).

The following groups of students had access to school buildings to a less extent:

- children of essential workers (15%)
- students who were considered at risk (11%).

Among schools that closed, 66 per cent of students attended schools whose principal reported that some or all teachers were onsite. Teachers being onsite would be able to teach the minority of students who had access to school buildings, as well as facilitate remote learning, such as using school resources, like computers, phones and photocopiers. Amongst students attending schools that closed, a minority of students (36%) attended schools where the principal reported offering remote learning programs to all students.

Almost 89 per cent of students attended schools where the principal reported that they were not prepared for providing remote instruction if their school buildings were closed to students for an extended period in the future. This indicates that Senegal has the opportunity to support schools to provide remote instruction in the case of future education disruptions.

Limitations to remote instruction and strategies to overcome barriers

Principals were asked to indicate the extent that their school's capacity to deliver remote instruction was limited by any one of ten options. The most common limitations indicated were:

- students' lack of internet access (89%)
- students' lack of digital devices (86%)
- concerns about providing equitable teaching (79%)
- difficulty in distributing hard-copies of learning materials (77%)
- lack of teacher experience (76%).

The least reported limitation was a lack of available teaching (37%). This indicates that the support many schools most need relates to accessing technology, rather than human capital.

Strategies were implemented to minimise the impact of the pandemic on teaching and learning. The most common strategies, rated by principals as important or very important, were:

- engaging the broader community (82%)
- communication between staff and students (81%)
- providing digital resources for teachers or students (61%).

The least common strategies were:

- distributing learning materials (55%)

- encourage educational TV/radio (50%)
- additional staff professional development (38%).

Support for teachers

Support was provided or promoted to teachers to assist them in supporting students and themselves. The most common forms of support were:

- peer support systems (50%)
- formal support networks, such as counselling services (37%)
- online wellbeing management programs and resources (25%).

The least common forms of support were:

- informal/social events such as book club (19%)
- access to physical activity resources (14%)
- professional association links and information such as mental health services (12%).

In response to the pandemic, teachers in Senegal were also provided with a range of professional learning activities. The most common activities were:

- methods for preventing the spread of infectious diseases, such as through hand washing (44%)
- student well-being (27%)
- teacher well-being (26%)
- methods to engage with families to support their child's wellbeing (26%)
- support for providing remote student instruction using digital technologies (26%).

The least common professional learning activities were:

- teaching students with special needs (17%)
- support for providing remote student instruction using digital technologies (16%)
- teaching specific content remotely (e.g., literacy, numeracy) (12%).

Student health and wellbeing and returning to school

Throughout the pandemic, many students attended a school that undertook activities to support student health and wellbeing. The most common activities were

- checking in with students (85%)
- contacting families (78%)
- providing specific support to students (61%).

Visits to students' homes were relatively uncommon; only 23% of students attended schools where the principal reported this strategy was used.

In preparing for regular teaching after the COVID-19 disruption, schools in Senegal made various provisions. Most frequently these involved:

- additional monitoring of students' health and safety (89%)
- spending time going over material that was already covered (87%)
- directing targeted teaching at learning areas where student achievement had not sufficiently progressed (74%)
- provide extra academic support only to students who have fallen behind (63%).

The least common provision was requiring or encouraging more students to repeat a grade (26%).

Principals were asked about their concerns after the COVID-19 disruption. They reported concern about all four options, which were:

- students' academic progress (96%)
- students' health and wellbeing (95%)
- the ability of staff to cope (90%)
- the principal's own ability to cope (98%).

Student contexts

A student's context, including their home environment and the level of support that they are provided, can shape their achievement levels (Çiftçi & Cin, 2017; Cullinane & Montacute, 2020). The resources that students have access to at home can greatly mediate the effects of disruptions to learning resulting from COVID-19 (Cullinane & Montacute, 2020; Reimers & Schleicher, 2020). Hence, the effect size of various factors related to student characteristics, home environment and support are analysed and compared.

An effect size is a measure of the strength of the relationship between two variables using a standardised difference. The stronger the effect size, the stronger the relationship between the variables of interest (e.g. family wealth) and the outcome variable (e.g. mathematics proficiency). Nine indices were created based on a collection of related items from the Student Questionnaire. These indices are student anxiety, student disability, family wealth, parental education, parental literacy, family support, teacher support, school support and assessment language (whether assessment language was the main language spoken at home). The MILO Main Report (UIS & ACER, 2022) provides further details about the effect sizes and specific scales constructed.

As can be seen in Figure 1, family wealth had the strongest relationship with student proficiency in both reading and mathematics; students from wealthy families exhibited higher levels of proficiency than students from less wealthy families. Likewise, there was a strong relationship between having parents with high levels of education and literacy and proficiency in reading and mathematics. There was a similar finding for family support, with family support having a positive relationship with their child's proficiency.

Students who spoke the language of assessment at home (French), had higher proficiency in reading and mathematics compared to students who spoke another language at home. This effect size was larger for reading than mathematics, likely due to the higher language demands required for reading compared to mathematics.

Students with higher levels of anxiety had a higher level of proficiency in reading and mathematics. More school support reported by students correlated with greater proficiency in reading and mathematics. Conversely, students who reported teacher support appeared to have a minimal relationship with proficiency. Finally, students with disability showed lower proficiency in reading and mathematics compared to those with no disability.

This comparison of effect sizes highlights that, in Senegal, the factors that have the strongest relationship with student proficiency in reading and mathematics relate to the home environment, and less so to the school environment or personal characteristics of students. This is consistent with meta-analytical research indicating that the home environment has the largest impact on student achievement (Hattie, 2008).

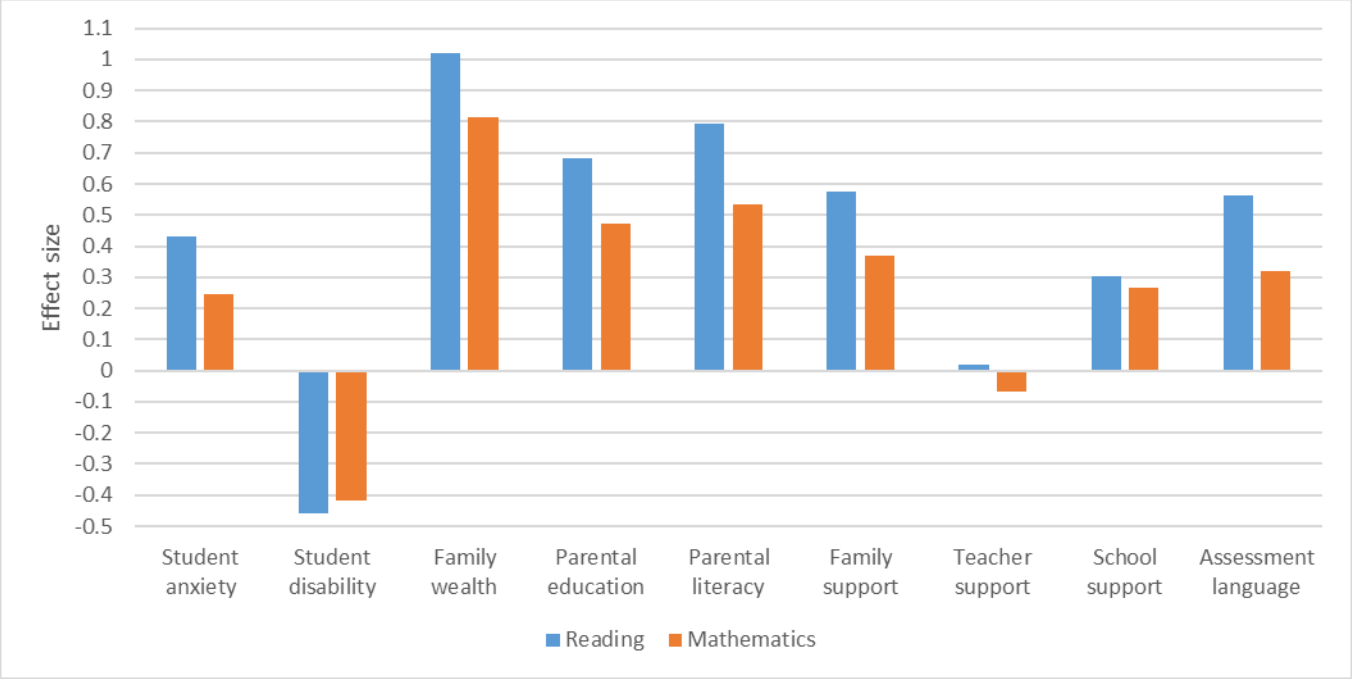

Figure 1: Reading and mathematics proficiency shown against the nine indices created from the Student Questionnaire

Conclusion

It is encouraging that Senegal students and schools demonstrated resilience in the face of the COVID-19 education disruption. Learning outcomes for reading and mathematics between 2019 and 2021 remained steady.

One possible explanation for these results is that the 12 weeks that students from examination classes were absent from school due to COVID-19, were offset by the approximately 25 weeks that students had been at school prior to the administration of the AMPL. Further, students in examination classes, including Grade 6 students (the target grade in the MILO project), were given priority access, both during nationwide and partial school closures. Upon returning to school, principals reported that teachers commonly went over learning material that had already been covered and targeted teaching at specific learning areas. The material covered by teachers may have focused more on reading and mathematics compared to other academic and non-academic areas. Hence, while declines in these core areas are less likely, declines in other areas not assessed in the MILO study (such as science or social and emotional skills) might have occurred.

The MILO contextual findings provide insights into how learning progress in Senegal can continue to improve. The three recommendations presented below are elaborated on in the MILO Main Report (UIS & ACER, 2022):

- **Prepare for the provision of effective remote teaching and learning for future disruptions**. It was widely reported by principals in Senegal that they were not prepared for future disruptions to education. Remote teaching needs to reflect the low technology environment of many families in Senegal, building on the strengths indicated by principals related to communication with families and teachers. However, planning needs to incorporate how barriers to remote education can be overcome through broadening access to and use of technology.
- **Continue to emphasise supporting the wellbeing of the school community**. Principals in Senegal were concerned about their own wellbeing, the wellbeing of teachers, and above all, student wellbeing. Although activities were taken to support wellbeing, such as checking-in with students, these could be supplemented with more targeted support. For example, a limited proportion of students attended schools that provided access to students who were considered at risk during the COVID-19 disruption. All students can benefit from the targeting and tailoring of support to their needs.
- **Ensure that there are effective systems in place to continue to monitor learning outcomes**. The targeting of support aimed at both wellbeing and student leaning can be greatly assisted though effective monitoring of student outcomes. For example, in addition to collecting data related to mathematics and reading, other domains could be monitored, such as social and emotional learning. At the classroom-level and school-level, assessments can provide helpful feedback to

students, parents and teachers, informing them of progress, what to work on and how to reform practices. System-level information can be collected through participation in national, regional or international assessments. The MILO project has provided tools, methods and capacity development to support Senegal's monitoring system. This includes using the AMPL to monitor Senegal's progress towards achieving SDG 4.1.1b.

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