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CHAPTER 8

Discussion of findings

INTRODUCTION

This chapter discusses the main findings presented in Chapters 4 to 7 and how they align to the goals of the MILO project. The discussion also analyses how the findings relate to the conceptual framework and the corresponding themes of the contextual questionnaires. It also shows how the MILO findings fit within the broader research on the impact of the COVID-19 disruption on global learning outcomes. The chapter then presents the implications of the findings for policy and practice.

The chapter then outlines possibilities for using the Assessments for Minimum Proficiency Levels (AMPL) in other contexts, for the purpose of reporting against SDG 4.1.1 and potentially providing statistical alignment of national and cross-national assessment programmes. The report closes by noting some limitations to the MILO study and pointing out opportunities for future research and development.

THE IMPACT OF COVID-19 ON LEARNING OUTCOMES

The first overarching goal of the MILO project was to evaluate the impact of COVID-19 on learning outcomes and measure any learning loss by reporting against Sustainable Development Goal (SDG) indicator 4.1.1b. Chapters 2 and 3 of this report describe how MILO achieved this evaluation by designing Assessments for Minimum Proficiency Levels (AMPL) to estimate reading and mathematics proficiency at the end of primary schooling. The AMPL results were reported as the proportion of students who reached the Minimum Proficiency Levels (MPLs) for SDG 4.1.1b.

As presented in Chapter 4, there was no learning loss observed for the end of primary school population¹⁵ in any of the MILO countries in either reading or mathematics. Burkina Faso experienced an improvement over time for students in mathematics; a higher proportion of students met the MPL in 2021

than did so in 2019. At the sub-group level, there was evidence of learning loss in mathematics for boys in Kenya, with the proportion who achieved the MPL dropping between 2019 and 2021.

Before the implications of these findings can be explored, it is useful to compare the performance of populations over time and whether their demographic characteristics are comparable. The gender, age, socioeconomic status (SES) and proportion of students living in an urban setting can all influence achievement in reading and mathematics at the primary school level (Pacific Community Educational Quality and Assessment Programme, 2019; UNICEF & SEAMEO, 2020). Changes in the proportions of students within each of these demographic characteristics mean that changes in achievement can be expected. For instance, given the strong association between SES and achievement in developing countries (Çiftçi & Cin, 2017; UNICEF & SEAMEO, 2020), we would expect an increase in the SES profile of the population over time to accompany an increase in achievement over time. This is particularly relevant for the MILO project as research suggests that African students from disadvantaged backgrounds are more at risk of dropping out of school due to the COVID-19 pandemic (Mthlane et al., 2021).

There are difficulties in linking population differences with differences in learning outcomes when comparing the background characteristics of students between the pre-pandemic assessment and the AMPL. For instance, the increase in the proportion of students in Burkina Faso who achieved the MPL for mathematics in 2021 is not accounted for by differences in wealth between the Grade 6 populations of 2019 and 2021, given that students from the earlier population come from homes that are estimated to be comparably wealthier. Similarly, the learning loss measured for Kenyan boys in mathematics cannot be explained by wealth differences between the populations at the two points in time. The boys from the Kenyan population in 2021 (who were less likely to meet the MPL compared to those from the historical assessment) were estimated to be comparably wealthier.¹⁶

UNDERSTANDING THE IMPACT OF COVID-19 ON LEARNING OUTCOMES

There are many reasons that could explain why students at the end of primary school were able to maintain learning outcomes in reading and mathematics after the onset of the COVID-19 pandemic, at least until mid-2021.

Learning gains that may have otherwise been achieved since the previous assessment may have been suppressed by the pandemic

For most MILO countries, the time between the historical assessment and AMPL spanned 2–3 years, with schools open as normal for much of that time. It is feasible to expect that if not for the COVID-19 disruption, there may have been a learning gain over that period of time. Indeed, there were gains over time in reading performance for PASEC countries between the 2014 and 2019 assessments (Nestour, 2021). With educational reforms and improvements to curriculum, it is reasonable to expect that there may have been more students who met the MPL than there were several years ago. This expected gain, however, may have been offset by pandemic disruptions. The effect of the pandemic may have been to nullify any gain in learning outcomes that would have been expected given historical trajectories.

Students already on track to achieving the MPLs may have been less impacted by the COVID-19 disruption

Another finding from PASEC 2019 was that the higher performing students had higher achievement in reading than they did in 2014, whereas the same increase was not observed for lower performing students (Nestour, 2021). Inequities between schools increased over this period. These findings raise the question as to whether students who were already on track to meet the MPL were not as impacted by the pandemic disruption as those who were not. Results from Chapter 7 suggest that disadvantaged students (from households with fewer resources or who had parents with lower levels of literacy

and education), were more likely to have poorer achievement in reading and mathematics. Those who had books at home, ICT devices and parents who could act as 'home learning teachers' would be expected to be better equipped to withstand the lack of face-to-face schooling.

Low proportions of students who met the MPLs in historical assessments make decline difficult to observe

The MILO study highlights an alarmingly low proportion of students from the historical assessments who met the MPLs in either reading or mathematics. For instance, of the five countries with historical assessment data for reading, fewer than 15% of students achieved the MPL in the historical population, including two countries where less than 2% achieved this level. For mathematics, four of the six MILO countries had fewer than 18% of students that achieved the MPL in the historical population, including two countries where less than 8% achieved this level. At such low levels, obtaining statistically significant reductions in the proportion of students meeting the MPLs becomes much more difficult, compared to countries where a more substantial proportion of students met the MPLs. In many of the MILO countries, it may have been that the proportion of students who met the MPLs were already at a floor, and any disruption may not substantially impact this floor effect.

One might expect that the COVID-19 disruption may have resulted in those students not meeting the MPLs (who were disproportionately more likely to be those facing some sort of disadvantage) falling further behind in their learning compared to their peers. The AMPL was designed as an efficient tool to measure the proportion of students meeting the MPLs. Therefore, the AMPL does not measure the proficiency levels of students below the MPLs. As discussed later in this chapter, there are opportunities in the future for the AMPL to be used to complement existing national or regional assessments to measure and describe the broad range of abilities that children at the end of primary schooling may exhibit in reading and mathematics, in addition to reporting against SDG 4.1.1b.

Students may already have recovered from any learning loss by the time they undertook the assessment

With the exception of Zambia, the AMPLs were not administered during the main period(s) of disruption and instead students were assessed after they had returned to school. The timeframe for the return to school after the greatest periods of disruption was many months to a year (as detailed in Chapter 5). Data from Chapter 6 show that many students attended schools where academic progress was monitored during and post the disruption. It is feasible that students whose learning was disrupted during this period would have recovered, to some extent, by the time the AMPL was administered. If AMPL had been administered immediately after students returned to school, learning loss may have been evident. Likewise, the disruption caused by the pandemic was not isolated to the period before the AMPL. The MILO countries, much like the rest of the world, experienced additional pandemic disruption after data collection, and, as of late 2021, the disruptions appear likely to continue.

Mitigation strategies may have lessened the impact on reading and mathematics outcomes compared to other academic and non-academic areas

The AMPL assessed minimum proficiency in reading and mathematics. While these are fundamental subjects, they do not encompass the range of skills that students would be expected to learn at primary school. For instance, science, creative arts and physical education are more difficult to incorporate into teaching and learning programs during a period of disruption.

Additionally, the development of social-emotional skills is a fundamental element of primary schooling that is difficult to integrate into teaching and learning programs during periods of disruption. This is particularly true of the MILO countries, which have minimal digital technologies infrastructure (see Chapter 7). Indeed, social-emotional skills are vital for childhood development, and have strong links with academic performance (OECD, 2020) and childhood behaviours (Durlak et al., 2011). Chapter 5 details

that four of the MILO countries had policies for collecting data on student achievement. Yet as observed in Table 5.9, no country indicated that they had policies for collecting information to monitor the impact of the pandemic on students' emotional health. Certainly the results in Chapter 7 highlight that the majority of students were worried about COVID-19 and the impact it would have on their schooling and felt anxious generally.

Families, schools and educational systems were able to offset much of the impact of the disruption

The second overarching goal of the MILO project was to identify the impact of different distance learning mechanisms established to remediate the learning disruption. Indeed, findings point to a substantive response by systems, schools and families in response to the pandemic.

The five countries that experienced school closures had national policies and plans to direct teaching and learning at schools during the pandemic. These plans included providing extra support to groups of disadvantaged students, changing school organisation, minimising academic disruption and offering support services to staff. Assessment and monitoring practices were implemented and various support measures

were put in place to encourage students to return to school once the disruption had concluded.

Although school principals reported there were a number of barriers to remote learning (including lack of digital infrastructure), systems were put in place to continue learning. These included providing students with a range of non-digital learning materials such as handouts, suggesting TV/radio shows, engaging the broader community, enabling communication between students and staff, requiring staff to provide feedback to students and making provisions for disadvantaged students.

Parents were crucial in providing support during the pandemic. Students who reported that they received greater support from their parents performed better on the AMPL than students who did not. This was reinforced by the findings that showed an association between academic achievement and having literate parents. Likewise students who reported receiving greater support from their teachers and schools tended to have higher levels of achievement. It is likely that without the mechanisms put in place during the pandemic by those important to students' learning – their families and community, their teachers, their schools, their educational systems – the impact of the pandemic on learning outcomes may have been far greater.



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OTHER RESEARCH ON THE EFFECT OF COVID-19 ON LEARNING OUTCOMES

Besides the MILO project, there have been a range of other studies that have sought to investigate the impact of the pandemic on learning outcomes. Most of these were conducted in high income country contexts and present complex findings. Often, evidence from these studies suggests that school closures resulting from COVID-19 have had a negative impact on student learning. Although simulation and speculative studies forecast dramatic declines in student learning (Azevedo et al., 2021; Kaffenberger, 2021), the actual impacts on learning outcomes appear to be more modest and mixed.

Mixed evidence on learning gains and losses

Thorn and Vincent-Lancrin (2021b), reviewed the evidence about the impact of the first wave of COVID-19 school closures that occurred from March to June 2020 for the OECD. This report drew on evidence from Australia, England, Flanders, France, Germany, Italy, Netherlands and the United States. It concluded that:

there is ... conflicting evidence from standardised tests regarding students' learning progress during school closures compared to progress in 'normal' conditions ... differences observed between the performance of students tested in 2020 or in early 2021 with students in the same year of school in previous years range from small increases to large falls. ... At the very least, the available evidence suggests that it should not be automatically assumed that the school closures ... had a large negative impact on student progress and achievement. (Thorn & Vincent-Lancrin, 2021b, p. 94)

In an earlier review, based on a sub-set of studies presented in their OECD report, with data collected in mid-to-late 2020, they found that 'for most (though by no means for all) children, missing 8–18 weeks of face-to-face schooling appears not to have had dramatic consequences for either their academic or broader development' (Thorn & Vincent-Lancrin, 2021a, p. 383).

Studies that have focused on individual countries have also found mixed results regarding the impact of the pandemic on learning outcomes. For instance, in comparing results from mid-2021 to mid-2019, Blainey and Hannay (2021) found that although mathematics achievement in Grades 2 and 6 declined in England, reading results remained relatively static.

Some studies found that learning declined in primary school but not secondary school. For instance, in California, Pier et al. (2021) found that while there was a learning loss when comparing results in mathematics and literacy from late 2020 with late 2019 in the early to mid-school years, there was actually learning gain in the mid-to-late school years. Similarly, in Switzerland, there were declines in mathematics and literacy in upper primary school, while students in lower secondary school were 'largely unaffected' (Tomasik et al., 2021, p. 566). This was based on comparisons of achievement results taken eight weeks prior to school closures to eight weeks into closures.

However, some studies found the opposite pattern and showed that primary students fared better than secondary students. An Italian study found that while primary school learning outcomes in mathematics remained stable, with slight improvements in literacy, there were learning losses in the later years (INVALSI, 2021). This was based on large-scale assessments that took place at the end of the 2021 school year in June, involving over 1.1 million students. In Denmark, a study found that reading assessments conducted in mid-2021 (three months after schools reopened) showed that students in lower and upper primary school experienced learning gains compared to expected test trajectories, whereas there was learning loss for lower secondary students (Birkelund & Karlson, 2021). The French DEPP study, which Thorn and Vincent-Lancrin (2021a) describe as the most robust available, found negligible gains and losses for students in early primary school, but a significant gain in late primary school in both literacy and mathematics (DEPP, 2021). This was based on national assessments conducted in late 2020 and early 2021, which were compared to results from pre-pandemic years.

One of the few studies in a low- or middle-income country was conducted via a household survey in the Indian region of Karnataka in March 2021. It measured various abilities in arithmetic and reading in children aged 5 to 16 years. Although overall reading and mathematics abilities declined, there were improvements in some sub-skills. For example, more Grade 6 students in the 2020–21 cohort were able to do subtraction than those in the 2018–19 cohort (ASER, 2021).

Neutral impact on learning outcomes

Some studies have found neutral impacts across grades and learning domains. An English study on reading found there was no statistically significant change between 2018–19 cohorts and 2020–21 cohorts in both primary and secondary grades after COVID-19 school closures (GL Assessment, 2021). In Australia, preliminary results from national standardised assessments, which are conducted in Grades 3, 5, 7 and 9, indicated slight gains across all assessed grade levels in literacy and mathematics between the 2019 and 2021 cohorts, albeit the gains were not statistically significant (ACARA, 2021). Moreover, the results were similar between states that experienced extensive school closures and those with minimal or no school closures. Hence, it appears that in some countries, student learning is particularly resilient.

Learning loss and recovery

Some studies found learning losses especially in mathematics. For example, in the Netherlands, Engzell et al. (2020) found loss in mathematics and literacy in both lower secondary and upper secondary, equivalent to a fifth of a school year. In this study, data were collected via national assessments in 2020, just prior to and just after school closures, and then compared to the trajectory of the three preceding years. At the primary school level, a UK study found that students typically lost the equivalent of over two months progress in reading and over three months in mathematics (Renaissance Learning, Education Policy Institute, 2021). This was estimated based on comparing results in assessments from 2019 to 2021. These results

highlight that ‘learning loss’ may be more accurately described as reduced learning gain (Thorn & Vincent-Lancrin, 2021b).

Two African studies found learning loss. In rural Kenya, in comparison to the ‘maths age’ benchmark used, students in primary and lower secondary school in late 2020 to early 2021, were on average more than 3.5 months behind (Whizz Education, 2021). However, this was based on a small sample of only 965 students who were active in a private tutor program. When reading achievement was measured in South Africa, learning losses were also observed, where students in the two grades measured (Grades 2 and 4) appeared to be more than half a year behind pre-COVID cohorts (Ardington et al., 2021).

Findings that indicate definitive learning loss are, on further examination, often more complex. An early study on the impact of learning was conducted in Sao Paulo, Brazil, where it was shown that children in Grade 6 had declined by about 72%. However, the bulk of the data were based on comparing schools that were still closed in the final quarter of 2020 to the same period in 2019. When analysis was conducted on a smaller subset of schools that had partially opened for optional in-person activities for, at most, 5 weeks, the effect was significantly reduced (Lichand et al., 2021). If results significantly improved even under highly curtailed school attendance, it suggests that they would continue to improve when returning to full-time school for months, as occurred with the MILO countries.

This is reinforced by other studies that showed learning recovery based on time back at school. In an English study, attainment in reading in Grades 2 and 6 was similar to pre-pandemic cohorts when assessed towards the middle of 2021, despite the indications from assessments held earlier in the year that students were two to three months behind (Blainey & Hannay, 2021). Similarly, after recording declines in oral reading fluency in May 2020, an American study across 111 districts showed that these learning rates almost returned to their pre-COVID-19 levels by the latter half of 2020 (Domingue et al., 2021).

While on average school closures tend to result in learning loss, early research suggests that this can be mitigated or even prevented. For example, when schools were shut down in Botswana in response to COVID-19, a low-tech intervention was trialled, where students were sent a weekly text message, or a text message and a weekly phone call. Students who received the intervention did almost 50% better than students in the control group (Angrist et al., 2020).

Unequal learning outcomes

Most studies that analysed the differential impact of school closures on learning found that students from disadvantaged backgrounds were on average more negatively impacted, albeit, often not in all year levels and learning domains. For instance, in the Dutch study referred to earlier (Engzell et al., 2020), it was estimated that learning loss was 60% greater for students whose parents had low education. Studies conducted in England consistently found gaps in achievement widening. For instance, Blainey and Hannay (2021) found the gap in mathematics and literacy achievement between disadvantaged students and their peers increased in most grades, particularly in mathematics, with disadvantaged students in Grade 6 as much as 7 months behind their peers.

In the United States, some studies have found that high-poverty schools were disproportionately impacted by school closures (Curriculum Associates, 2020; Lewis et al., 2021). Similarly, there was evidence of greater learning loss in American counties with relatively high unemployment (Kogan & Lavertu, 2021). The Whizz Education study (2021) in rural Kenya also used geography as a proxy for SES, and found that a greater proportion of students from 'hardship' areas than other areas experienced learning loss. However, in Switzerland (Tomasik et al., 2021) and Denmark (Birkelund & Karlson, 2021), studies found little evidence of achievement gaps widening on the basis of SES (acknowledging that the variance in SES in these countries would be much smaller than in developing countries).

In the United States, there were mixed results about unequal learning outcomes, which are largely explained by studies focusing on different regions. One study found that gaps in achievement widened in primary and middle school, but not high school, when results from late 2020 were compared with late 2019 (Pier et al., 2021). Similarly, in France it was found that achievement gaps widened farthest in early primary school, as described in the DEPP study (2021). While in the INVALSI Italian study (2021) described earlier, the opposite was found, that learning gaps declined in primary school, but increased in secondary school.

Finally, it is interesting that some studies have found that even across similar contexts within a system, differences in the impact of the pandemic on learning outcomes have been observed. For example, for the learning outcomes of Grade 3 and 4 students in the Australian state of New South Wales, there was an increase in learning gaps based on SES in Grade 3 students but not in Grade 4 (Gore et al., 2021).

IMPLICATIONS FOR POLICY AND PRACTICE

Since early 2020, the pandemic has required countries to adapt their approaches to teaching and learning. Encouragingly, in the six MILO countries, schools, teachers, parents and students showed great resilience during the pandemic. Learning loss was not observed in the target population as a whole in any country in either reading or mathematics. However, the MILO results have shown that there is still some way to go to support all students to reach the MPLs for SDG 4.1.1b. Importantly, there is also a need to continue to support the wellbeing of everyone in the school community.

Each MILO country had a unique mix of educational responses to the pandemic. The pandemic has provided countries with opportunities to learn about the policies and practices that are necessary to prepare for future education in emergencies. It is essential that the policy and practice responses are tailored to the specific needs and priorities of each country and include all learners.

The MILO results have highlighted the need to continue work to build education systems that are adaptable, equitable and of high quality. The recommendations presented are intended to focus on system strengthening in the short-term as countries continue to face the pandemic, in the medium-term as countries move into the recovery phase, and in the long-term as countries continue to work towards meeting SDG 4.1.1b and as they prepare for other possible education disruption.

Prepare to provide effective remote teaching and learning for future disruptions

Countries continue to face high COVID-19 case numbers and Africa continues to have low vaccination rates (World Health Organization, 2021). Disruptions to face-to-face teaching continue to be a possibility for countries in 2022. To mitigate the impact of school closures on learning loss, it is important that all learners have opportunities to access high-quality remote learning. Preparing for the delivery of remote learning is important for any emergency disruptions that could cause school closures.

In the MILO countries, there was limited access to remote learning options during school closures. While closures affected students nationwide in most countries (see Figure 5.1), only around a quarter of students attended schools where the principals reported offering remote learning programs to all students (see Table 6.4). Many students lacked access to the internet and to digital devices (see Table 7.1) and only a limited proportion of students attended schools where the principals reported they had access to live virtual lessons or digital materials (see Table 6.11). Due to the resources available and accessibility issues, understandably many students attended schools where principals reported suggesting educational TV or radio as a resource for students (see Table 6.11).

The pandemic presented a situation whereby there was a sudden need to provide remote learning to large numbers of students. Countries need to identify how remote teaching can be

expanded so it reaches the greatest population of students to ensure that all students have access to learning support.

Any remote teaching needs to be appropriate for the local context, considering issues such as availability, accessibility and affordability (Dabrowski et al., 2020). Remote teaching using radio and TV can play an important role in reaching a wider group of learners. However, these technologies do not always provide opportunities for two-way dialogue and feedback between teachers and students or between students and their peers. More interactive remote teaching technologies, such as live remote lessons, can enable more opportunities for teacher-student connection and feedback.¹⁷ However, internet access and access to digital devices is limited in many countries, and when digital learning solutions are provided this can further exacerbate inequalities among students (Munoz-Najar et al., 2021). While long-term investments in ICT infrastructure and in the provision of digital devices to teachers and students will be beneficial (Tarricone et al., 2021),¹⁸ this is not always an option for low-income countries, conflict-affected areas or for geographically isolated communities. Therefore, policies and planning for remote learning must consider the needs of the local context, be fit for purpose and, importantly, consider the support that is required for teachers, learners and parents.

In addition to the accessibility of remote learning, effective pedagogy and effective education programs is central to both remote and classroom-based learning (Dabrowski et al., 2020). In the MILO project, principals reported a range of barriers to providing remote instruction, which included a lack of learning materials and a lack of teaching experience (see Table 6.6). Support for teachers to use and develop effective pedagogical practices and resources is an important priority in preparing for future educational disruptions.

Many of the MILO countries had national plans or policies at the system level around supporting remote student instruction in order to minimise academic disruptions (see Table 5.4). However,

many students attended schools where their principals reported that there was no planning for the transition planning to remote learning; curriculum plans were not adapted; (see Table 6.7) and there was not additional staff professional development to minimise the impact of the pandemic on teaching and learning (see Table 6.12). Ensuring the implementation of national priorities around supporting teachers and students in transitioning to remote learning will be important.

Continue to emphasise supporting the wellbeing of the school community

The pandemic has had wide-ranging impacts on people's physical and emotional health, income and job security, social support, and access to education. Within the six MILO countries there was evidence that the health and wellbeing of students, teachers and principals had been affected by the pandemic and that there were additional pressures on parents and families. As countries continue to face the effects of the pandemic and as they move into the recovery phase, there is a need for policies and resources to focus on supporting the wellbeing of the school community.

In the MILO countries, many principals expressed concerns about the wellbeing of their students and were almost universally concerned about their staff's and their own ability to cope (see Table 6.10). Students faced a range of family difficulties during the pandemic (see Table 7.2), and students

across most of the MILO countries were likely to report that they were more worried than before the disruption (see Table 7.4).

The MILO countries had a number of strategies already in place to support the health and wellbeing of the school community. For example, countries often had national plans or policies around support for staff wellbeing, such as providing access to formal support networks (see Table 5.5). Principals reported undertaking a number of activities to support student health and wellbeing, such as checking-in with students, contacting families, providing counselling and home visits (see Table 6.14). Many of the MILO countries used a range of modes of communication with families during the pandemic (see Table 5.6). Given the high levels of anxiety and stress experienced by students, teachers and principals, and the additional pressures on families, it is important that countries continue to place a strong emphasis on supporting and promoting the wellbeing of the school community.

All countries experienced concerns about the wellbeing of the school community and had implemented various support mechanisms. However, none of the countries collected data to monitor the impact of the pandemic on students' emotional health and only one country collected data to monitor the impact on teachers' emotional health (see Table 5.9). The recently developed



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Education in Emergencies framework (Tarricone et al., 2021) includes the policy recommendation that, in addition to collecting data on learning outcomes, data on health and wellbeing are collected in order to target support. Based on the findings in the MILO project, it is recommended that countries explore ways to effectively and appropriately measure the wellbeing of school staff and students in order to understand what support is needed and to monitor wellbeing over time.

Ensure that there are effective systems in place to continue to monitor learning outcomes

The dramatic social and economic impacts of the COVID-19 pandemic have brought the need for continued and regular monitoring of learning outcomes to the urgent attention of educational policymakers, practitioners and communities. There are global widespread concerns about the impact of the pandemic on learning outcomes. Ensuring that there are effective monitoring systems in place will allow countries to objectively investigate the impact of the pandemic on learning outcomes and measure learning outcomes during the recovery phase. These systems will also enable countries to identify whether there are particular groups of students who are more adversely affected and target support where it is most needed.

In order to measure the impact of the pandemic on learning outcomes, and to measure recovery from the pandemic, countries need to compare learning outcomes before, during and after the pandemic. In order to monitor learning outcomes at the system level, it is important that high-quality data on student learning outcomes are collected along with their associated contextual data, which enables the populations to be compared over time (as discussed above). Monitoring programs may include national, regional or international assessments.

The MILO project has provided a set of tools and methods to the six participating countries that will allow the continued measurement of the impact of the pandemic for the population as a whole and also for sub-groups of learners. For example, the MILO results showed that in some countries there were groups of

The dramatic social and economic impacts of the COVID-19 pandemic have brought the need for continued and regular monitoring of learning outcomes to the urgent attention of educational policymakers, practitioners and communities.

learners who may require additional support such as those with low family wealth, with parents who have low literacy or low levels of education, students that speak a different language at home than the language of instruction, or students with disability (see Figures 7.5 -7.9). Should countries choose to continue to use the AMPL, this will enable them to continue to measure progress towards SDG 4.1.1b.

In addition to collecting system-level information, classroom-level and school-level assessments measuring a range of domains can provide crucial feedback to students, parents, teachers and schools. In the MILO project, principals overwhelmingly reported they expected that the pandemic would have a negative impact on academic outcomes for all students (see Table 6.3) Gathering regular data on student outcomes will assist principals and teachers to identify where support should be targeted. This will enable countries to monitor a range of learning domains in addition to reading and mathematics, which can be used to inform teaching and learning.

FUTURE IMPLICATIONS FOR MEASURING SDG 4.1.1

As of late 2021 the COVID-19 pandemic continues to cause educational disruption. How long this continues and the severity of the disruptions are of course unknown. Beyond 2021, there is an opportunity to include other countries and other languages into investigations of the impact

of COVID-19, using the MILO tools and methods. The MILO study has successfully shown that the inclusion of the AMPL alongside an historical assessment of reading or mathematics can facilitate a link that allows the estimation of prior and current proportions of students meeting the SDG 4.1.1b MPLs. The closer the historical assessment is aligned to the reading and mathematics constructs defined in the Global Proficiency Framework (GPF), the more valid the link. In addition, the more technically robust the historical assessments, the more reliable the link. These methods can be used to estimate the impact of the pandemic.

The development of the AMPL has been a significant move forward in measuring SDG 4.1.1 regardless of the pandemic context. If suitable historical data does not exist for a country, the AMPL can still be used to establish a baseline for pandemic recovery.

The AMPL-b is a robust and efficient tool that measures the proportion of students who meet SDG 4.1.1b. Beyond 2021, the AMPL-b are resources provided by the UIS that can be used by countries and assessment programs to monitor progress against SDG 4.1.1b. The AMPL-b can be implemented by countries, regions or systems to suit their reporting needs. The AMPL-b can be used as a standalone assessment to efficiently report against SDG 4.1.1b. They can also be integrated into existing national or regional assessments to measure and describe the broad range of abilities that children at the end of primary schooling may exhibit in reading and mathematics, in addition to reporting against SDG 4.1.1b. This could be done for example, by rotating the AMPL-b forms within existing assessments, as was done in the MILO project.

The development of the AMPL has the potential to statistically align national and cross-national assessment programs to a single set of global standards. The AMPL-b strongly aligns to the GPF for reading and mathematics (USAID et al., 2020a, 2020b). The global standards are articulated in SDG 4.1.1, and are elaborated by the definitions of the Minimum Proficiency Levels (ACER-GEM, 2019, 2020). Incorporating the AMPL into national or regional assessments will facilitate reporting

against these globally defined benchmarks. The AMPL can translated into other languages.

Currently, the AMPL-b covers the end of primary schooling outcomes, SDG 4.1.1b. However, the same methods could be applied if further assessments are developed to measure learning outcomes at the end of lower secondary to address SDG 4.1.1c (AMPL-c) or the end of lower primary, SDG 4.1.1a (AMPL-a).

LIMITATIONS OF THE STUDY AND OPPORTUNITIES FOR FURTHER RESEARCH

As noted above, the AMPL-b are targeted to estimate the proportions of students meeting or exceeding the MPLs in reading and mathematics at the end of primary. This targeted approach was efficient but limits what can be explored in shifts in outcomes below these benchmarks. As discussed above, the AMPL can be used to complement existing national or regional assessments that provide more detailed information about students below the MPLs. In addition, in the future consideration can be given to including items within the AMPL that better align with the likely range of proficiency in the target populations.

The standard-setting process used in the MILO was rigorous and fit for purpose. However, it would be useful to replicate this exercise in other contexts or devise similar exercises to validate the findings.

What the MILO study has reinforced, is that the educational policy and practice responses to the pandemic were many and varied. The MILO datasets are rich in contextual information and these data are linked to estimates of learning outcomes. Deeper analysis using the MILO datasets is possible to further explore the different responses to the pandemic and the relationship to learning outcomes. In future applications of the AMPL, the collection of detailed and high-quality contextual information from multiple sources will be essential to understanding the factors influencing learning outcomes.

Endnotes

- 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).
- 2 In 2016 for Zambia
- 3 Contextual data from the historical population for Zambia was not available in a format suitable for direct comparisons of populations. Some contextual data was not available from the Kenyan historical assessment.
- 4 The GPF advisory group on alignment was a working group comprised of psychometricians and subject matter experts who contributed to the development of the Global Proficiency Framework in 2020. The group was convened to formulate a set of alignment criteria to allow assessments to be compared to the GPF in order to determine their suitability for evaluating and reporting against SDG 4.1.1. The alignment criteria are outlined in detail in: USAID, UIS, UK Aid et al. (2020) *Policy Linking Toolkit for Measuring Global Learning Outcomes – Linking assessments to the Global Proficiency Framework*.
- 5 From SDG 4.1.1 Review Panel: March 2021.
- 6 These items were reproduced with permission from CONFEMEN.
- 7 For the purposes of AMPL, this item was classified as “Retrieve information” rather than “Decoding” as consistent with the GPF for reading (USAID et al, 2020a) which lists matching a given word to an illustration as an example of retrieving information.
- 8 The four French-speaking countries were Burkina Faso, Burundi, Côte D'Ivoire and Senegal.
- 9 These items are used with permission from CONFEMEN.
- 10 Zambia's historical assessment was conducted in 2016. All other countries' historical assessments were conducted in 2019.
- 11 Historical results are not reported for Kenya since the 2019 assessment of English in Kenya did not contain a sufficient number of reading comprehension item to align with the reading constructs within the GPF.
- 12 In the MILO project, students were the primary sampled unit. All results from the School Questionnaire are reported using student weights that are representative of the population. Therefore all results from school principals need to be interpreted in numbers of students.
- 13 There is no consensus among researchers and practitioners on which are the best indicators to operationalise SES. Typical children SES indicators are parents' occupation and education level, household income and home possessions. For a review of SES indicators used in educational research and other disciplines such as health, economics and sociology see Osses et al. (forthcoming).
- 14 Results for Kenya have been excluded based on data validation issues
- 15 The population chosen by countries to report against varied from Grade 5 to Grade 7.
- 16 A wealth index for Kenyan students was computed based on common items from the historical assessment and the AMPL. Comparisons for boys over time revealed higher scores on the wealth index in the 2021 population in comparison to the historical population.
- 17 For further information on different learning approaches and the benefits, considerations and enabling conditions, see for example Dabrowski et al. (2020).
- 18 For further recommendations relating to education in emergencies, see the Policy Monitoring tool developed for building resilient education systems (Tarricone et al., 2021).
- 19 Magnitude of item by gender interaction estimates from a facet model. See PISA 2006 Technical Report (OECD, 2009a).
- 20 'Not reached' items were defined as all consecutive missing values at the end of the test, except the first missing value of the missing series which was coded as 'embedded missing' i.e. coded the same as other items that were presented to the student but which did not receive a response. Omitting the 'not reached' items from the item calibration ensures the item difficulties not to be over-estimated.
- 21 The psychometric properties of the reading items administered in Burundi was unexpectedly inconsistent with those of the other countries. In particular, the response patterns in nearly all of the reading items was consistent with high rates of guessing and resulted in very low discrimination. It was therefore decided to exclude Burundi from the international reading item calibration. Burundi student reading proficiency estimations were subsequently based on the international calibration.
- 22 Expected a-posteriori/plausible value (EAP/PV) reliability (Adams, 2005).
- 23 A two-dimensional model with Quadrature estimation with 40 nodes was used.
- 24 So-called weighted likelihood estimates (WLEs) were used as ability estimates in this case (Warm, 1989).
- 25 Conceptual background and application of macros with examples are described in the PISA Data Analysis Manual SPSS®, 2nd edn (OECD, 2009b).