Standard Setting Technical Report

COVID-19: Monitoring Impacts on Learning Outcomes (MILO)

15 November 2021

Acknowledgments

Contents

Introduction

The COVID-19: Monitoring Impacts on Learning Outcomes (MILO) project aims to measure learning outcomes in six countries in Africa, in order to analyse the long-term impact of COVID-19 on learning and to evaluate the effectiveness of distance learning mechanisms utilised during school closures. In addition, this project will develop the capacity of countries to monitor learning after the crisis.

The four overarching goals of the project are to:

> • Evaluate the impact of COVID-19 on learning outcomes and measure the learning loss by reporting against SDG indicator 4.1.1b
>
> • Identify the impact of different distance learning mechanisms put in place to remediate the learning disruption generated by COVID-19
>
> • Expand the UIS bank of items for primary education
>
> • Generate a toolkit so that assessment results can be scaled to international benchmarks, reporting against SDG 4.1.1.b.

This report provides a description of the MILO standard setting process and results. This standard setting exercise was implemented in order to support the first overarching MILO goal – to measure and report on any differences in learning outcomes in reading and maths in 2021 compared to prior to the pandemic.

Minimum Proficiency Levels

Assessments for Minimum Proficiency Levels (AMPL) tests were developed in the MILO project to measure the proportion of students meeting the Minimum Proficiency Level (MPL) in reading and mathematics at the end of primary. This MPL refers to SDG 4.1.1 (b):

Proportion of children and young people: […] (b) at the end of primary […] achieving at least a minimum proficiency level in (i) reading and (ii) mathematics, by sex

The End of Primary MPL is defined for reading as:

Students independently and fluently read simple, short narrative and expository texts. They retrieve explicitly-stated information. They interpret and give some explanations about the main and secondary ideas in these texts, establish connections between main ideas in a text and their personal experiences.

The End of Primary MPL is defined for mathematics as:

Students recognise, read, write, order, compare and calculate with whole numbers, simple fractions and decimals. Students can measure length and weight using standard units, calculate

the perimeter of simple 2D shapes and area of rectangles. They read, interpret and construct different types of data displays such as tables, column graphs and pictographs and recognise, describe and extend number patterns. They can solve simple application problems.

These definitions come from the *Minimum proficiency levels: Described, unpacked and illustrated* (ACER, 2019) a document that defines and further unpacks each of the six MPLs referred to in SDG 4.1.1.

The AMPL tests were administered in French (Burkina Faso, Burundi, Cote d'Ivoire, and Senegal) and English (Kenya, Zambia) in the MILO project in 2021.

MILO standard setting

To enable robust and valid reporting of student achievement against the MPL requirements, the systematic approach was taken to establish cut-scores that correspond to the end of the primary MPL requirements for each MILO domain (reading and mathematics).

ACER and the UIS organised and conducted the standard setting exercise in cooperation with officials and subject matter experts from all MILO participating countries. In addition, an international forum was convened to discuss the standard setting exercise outcomes and provide advice regarding the final proposal for MILO SDG 4.1.1b reporting standards in reading and mathematics.

Standard Setting Design Elements

A modified Yes/No Angoff method (Angoff, 1971; Impara and Plake, 1997) was used to determine a single MPL cut-score for mathematics and a single MPL cut-score for reading for each AMPL. The Angoff method is based on the concept of the borderline or minimally competent student– target student.

Competence and the target student

The minimally competent student can be conceptualized as the student possessing the minimum level of knowledge and skills necessary to perform at a level "on the borderline" between AMPL test performance at the MPL and below the MPL. The borderline, target student thus belongs to the group of students that just meet the MPL requirements.

MPL descriptions were developed independently from the AMPL and therefore the standard setting participants were provided with training in the MPLs. The participants also had access to the paper that described and unpacked the MPLs.

Rating the AMPL items

The Yes/No Angoff method requires panellists to independently decide whether the target student is likely to answer a test item correctly. The response probability (RP) is the probability of a person of a certain ability level to respond correctly. In a standard

setting exercise the RP is commonly set at 0.67 and this was the RP used in the MILO standard setting exercise.

Determining the final cut-scores

AMPL cut-scores were determined through rigorous implementation of the standard setting exercise and were then finalised following an educational impact review involving international educational community stakeholders. The panellist decision process is further described in the method section.

Implementation approach

Owing to the travel restrictions caused by the pandemic, all standard setting activities were conducted as remote online sessions. ACER provided participants with access to an online system designed to implement the Yes/No Angoff standard setting procedure, record panellist judgments and provide agreement reports to the standard setting participants and facilitators.

Method

Participants

MILO national project managers were asked to nominate subject matter experts and expert practitioners to participate in the training and the cut-point drafting in reading and mathematics.

The invitation asked for nominations of panellists with either of two broad areas of expertise:

> • Expert teachers of reading or mathematics, with experience in teaching at the end of primary and who have a strong understanding of the capabilities of learners at that level.

> • Reading or mathematics subject matter experts, with experience in assessment development, curriculum development, or pedagogical training.

National Project Managers were asked to nominate 4-6 experts for each of the domains Due to the interest from some of the National Project Mangers, the participating countries were also invited to nominate observes who were allowed to participate in the standard setting exercise, but their results were not used in determining the standard cut cores.

The breakdown of participants across domain, language and standard setting exercise participation status is provided in Table 1.

Table 1: Number of participants across AMPL domain, language, and participation status

Domain	Language	Participation status	No. Planned	No. Actual
Reading	English	Panellist	10	10
Reading	English	Observer	5	3
Reading	French	Panellist	13	6
Reading	French	Observer	5	1
Mathematics	English	Panellist	10	7
Mathematics	English	Observer	5	2
Mathematics	French	Panellist	12	8
Mathematics	French	Observer	7	2

Materials

The intact AMPL reading and mathematics tests in English and French were used in the standard setting exercise. During the training phases, participants had access to the original AMPL tests (PDF format). During the judgment and consensus sessions the participants had access to digital versions of each item, through ACER's online standard setting system. The online system also provided information about the item keys and reading items were displayed with the relevant stimulus material.

Participants had access to the end of primary MPL unpacking paper and all PowerPoint presentation training materials. A copy of the MPL unpacking paper adapted for the MILO project is provided in Appendix A. All materials were provided in both English and French.

Design

The standard setting exercise consisted of training, individual judgment and consensus building sessions. The training session was a plenary session provided in English with simultaneous French interpretation. For the individual and consensus sessions, participants were separated into different groups by language and domain.

Following the setting of draft cut-points in the above exercises, a standard setting impact review session was conducted which included representatives from the educational community that operates in SDG 4.1.1 reporting activities. Participants in this session were invited by the UIS.

Training session

The standard setting participants were trained on the standard setting method and the online system used to conduct the standard setting activities. The training covered:

- the overall process

- the Minimum Proficiency Level

- the target student

- the implementation of adopted RP rate of 0.67 in rating of items

- training in the online system for the Yes/No Angoff procedure.

An additional one hour training session was conducted ahead of the individual judgment session for participants who were not able to attend the main training session.

Judgement session

In the judgment session participants worked individually to analyse the items and rate each item in relation to performance by the target student. Participants were able to contact ACER facilitators during the individual session if they had questions.

Consensus session

Immediately following the individual judgment sessions, each language by domain group convened for a virtual session to attempt to find consensus on the cut-point. These sessions were facilitated by ACER and participants could update and change their responses in the online system during the consensus session.

Impact review

The outcomes of the consensus group sessions were analysed by ACER to determine the feasibility of the cut-scores for the AMPL tests in English and French. The final set of proposed cut-scores were established following this analyses. The percentage of students at and above the MPL were calculated using the AMPL preliminary raw data (number of correct responses in a test).

The overview of the standard setting exercise, its outcomes and preliminary impact data were presented and discussed at the impact review session. In addition to MILO country representatives, this session included experts invited by the UIS. The list of participating organisation and experts is provided in Appendix B.

Procedure

ACER provided access to an online system designed to implement the Yes/No Angoff standard setting procedure, provide access to items (the AMPL items, by subject and language), record panellist judgments and provide agreement reports to the panellists and standard setting facilitators.

The item rating using the RP of 0.67 was formulated to the participants in the following way:

How likely is it that a minimally proficient student will be able to answer this item correctly?

If twice as likely as no, answer <u>Yes</u>.

If <u>less than</u> twice as likely as not, answer <u>No</u>.

The screenshot of the standard setting online system is provided in Figure 1
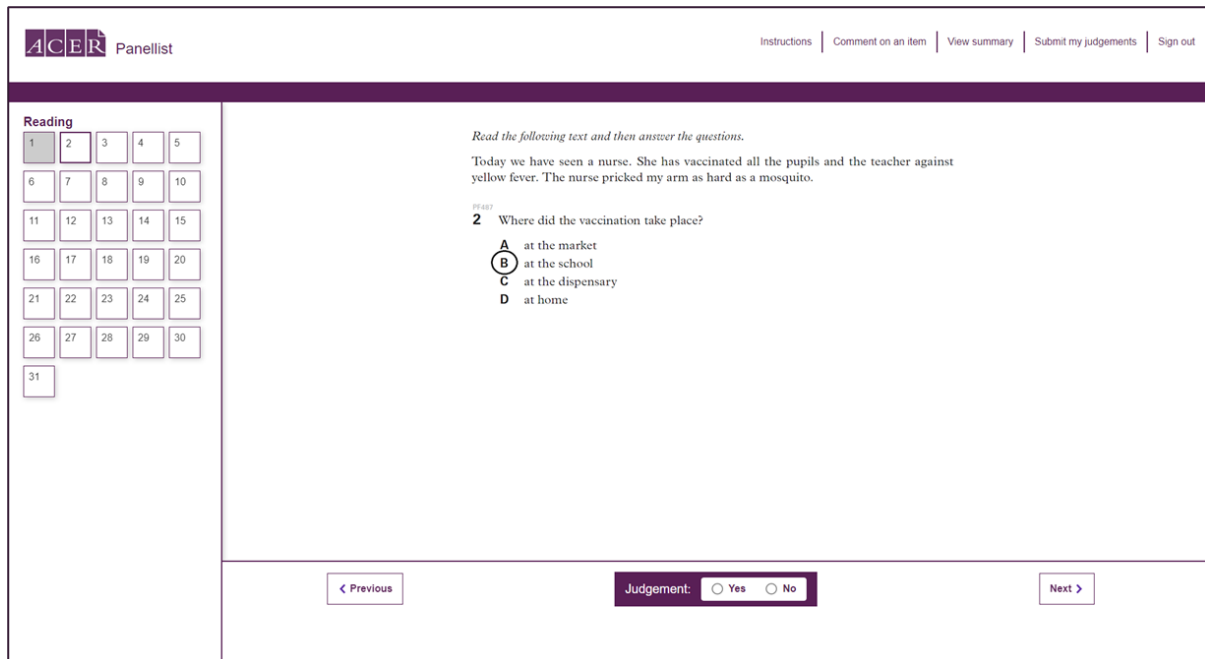
Figure 1: An illustration of the online standard setting system

The participants entered their responses in the online system. They were able to navigate freely through items in the system and to make changes to their rating in the individual session. Furthermore, the participants were able, and were encouraged, to change their own rating for any of the items during the census session and during the two hours following the end of the virtual consensus session.

Results and discussion

The participants' judgments were extracted from the online system and analysed for completeness of responses. The data for one panellist in the reading group was incomplete and these data were removed from the subsequent analyses.

Given that intact reading and mathematics tests were used in the exercise the number of items to which a participant responded affirmatively is the cut-score. Figure 2 provides the distribution of the initial cut-scores for reading across the two language groups.
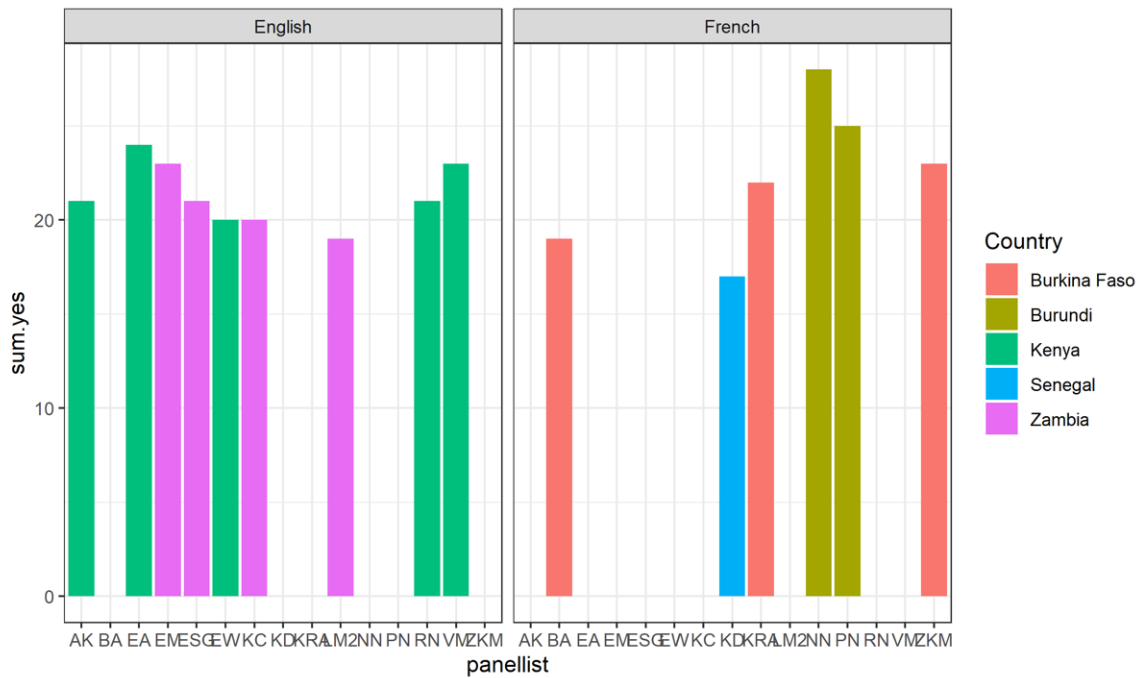
Figure 2: Initial cut-score distribution by language: Reading

As can be seen in Figure 2 there is no systematic difference in cut-score placement between the two language-based groups of panellists. Therefore, judgements from the two language groups were merged and all subsequent analyses used these combined data. A similar outcome was observed in mathematics, illustrated in Figure 3, and thus the mathematics judgements were also merged by language.
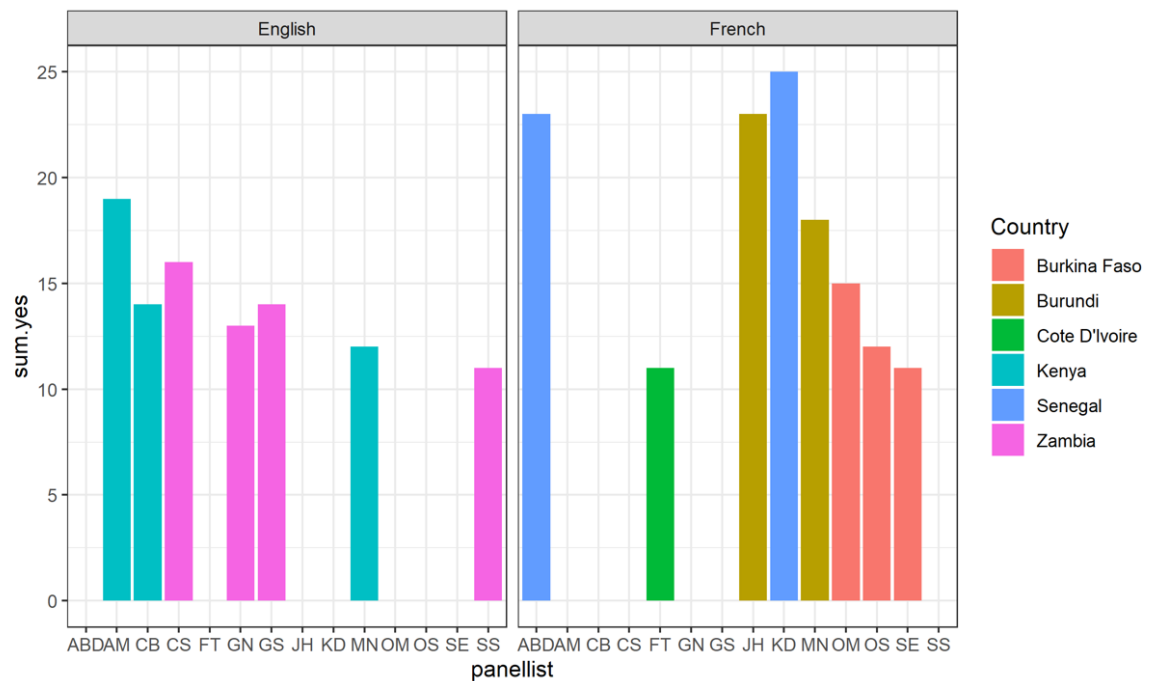
Figure 3: Initial cut-score distribution by language: Mathematics

Participants were able to change their initial judgements during the consensus session. However, panellists in both domains and in both languages choose to do so only in a very small number of cases. The summary statistics for the proposed cut-scores were calculated only for the final judgements extracted after the consensus sessions for the two domains and are presented in Table 2.

Table 2: Consensus session outcomes

Domain	N	median	M	SD	min	max	range
Reading	15	21	21.7	2.7	17	28	11
Mathematics	15	14	15.8	4.8	11	25	14

The difference between the median and mean is within two score points for both domains which is acceptable for the achieved sample size. The range of panellists' cut-scores is larger in mathematics group. In order to determine the confidence interval for median and mean statistics, a non-parametric Monte Carlo bootstrap procedure was implemented to extract the lower and upper boundaries of the 95% confidence interval.

Table 3 provides the 95% confidence interval boundaries, rounded to the nearest integer, for the median cut-scores for the two domains.

Table 3:   Cut-score confidence intervals: Median

Domain	N	median	95% CI lower	95% CI upper
Reading	15	21	19	22
Mathematics	15	14	10	17

The 95% confidence interval for mathematics appears to be quite wide. Table 4 provides lower and upper boundaries for the mean cut-scores in reading and mathematics.

Table 4: Cut-score confidence intervals: Mean

Domain	N	mean	95% CI lower	95% CI upper
Reading	15	22	20.4	23.0
Mathematics	15	16	13.4	18.1

As can be seen, the 95% confidence interval around the mean cut-score for reading is relatively similar to that around the median. The width of the confidence interval around the mean cut-score in mathematics was smaller relative to that around the median. These outcomes indicate that using the mean cut-score statistics would provide a more stable option for calculating the position of the final cut-score.

The consensus median and mean statistics were used to calculate the proportions of students at and above the MPL standards for the five countries for which AMPL data were available when the impact review session was held. These analyses were done without applying sampling weights, as they were not available, and these results are not presented in this report to avoid any confusion with the main MILO reporting efforts.

The impact review session included the overview of the AMPL assessments, the MPLs and the definition of the target student. The standard setting method and procedure was described and outcomes of individual and consensus sessions were presented. The provisional AMPL impact data was then shared with the participants.

During the impact review, a number of participants confirmed that the impact data presented generally fit the pattern of results they had observed in their own national, regional or international assessments. The group thus concluded that the proposed cut-scores overall provide a feasible solution for the SDG 4.b MPL standard.

The impact review participants then discussed which of the two statistics, mean or median, should be used to calculate the final cut-scores. The group concluded that the mean provides a solution that uses maximum available information from the judgment sessions and solution that is in line with other international assessment reporting.

The impact data session participants thus endorsed the proposal to set cut-score of 22 for reading and cut-score of 16 for mathematics as the end of the primary MPL standards.

Panellist and observers perception of the standard setting exercise

ACER provided the participants (panellists and observers) involved in the individual and consensus sessions with certificates of participation and a feedback survey. The ACER GEM Centre also provided the panellists with an option to receive an honorarium payment.

The purpose of the feedback survey was to gauge the level of participants' engagement with the key standard setting activities, materials, and procedures. The survey consisted of 10 items and a four point rating scale (strongly disagree, disagree, agree and strongly agree).

Feedback was received from 29 participants, the summary across all feedback survey items is presented in Table 5. The feedback received was very positive. For example, all participants said that they understood how to complete the task and how to judge the item. Some participants found the website difficult to use, and in the comments received, some participants noted that they had internet connectivity issues.

Table 5: Standard setting participant feedback

Feedback (N = 29)	Strongly agree /agree (N)	Disagree (N)	No response (N)
I felt that this procedure allowed me to recommend cut-scores that reflected my thinking.	27	1	1
The training materials were helpful.	28	1	-
Working through the student test prior to the judgement exercise was helpful and informative.	29	-	-
The Minimum Proficiency Level definitions were clearly communicated.	28	1	-
I understood the task and how to judge an item.	29	-	-
I had enough time to make my judgements during the individual session.	27	2	-
My group shared a common understanding of the Target Students.	27	2	-
Defining the Target Students helped me make my judgements.	29	-	-
I had enough time to reconsider my judgements during the group session.	28	1	-
The standard setting website was easy to use.	25	4	-

Such feedback from the participants indicates that the standard setting exercise managed to successfully engage the participants, providing further evidence for the validity of the exercise outcomes and the proposed cut-scores.

The final cut-scores proposal

The psychometric analyses of the complete AMPL data set found that one mathematics item and two reading items functioned differently across the two languages used in AMPL. Consequently, the responses for these items were removed from psychometric scaling which meant that the number of correct items on the tests could not be used to transpose the proposed cuts for the end of the primary standards on to the AMPL psychometric scales.

In order to enable the direct translation of the prosed standards' cut-scores, the decision was thus made to remove judgements for these three items from the standard setting data set. The Angoff standard setting method focuses on individual items and does not rely on the sequence by which items are presented to the panellists. Therefore removing items in such a post-hoc fashion does not have any impact on the validity of the remaining judgments nor on the standards' cut-score calculated from such the updated data sets.

Table 6 provides a summary of the proposed cut-scores after removing the three items with poor psychometric properties, including the 95% confidence interval, rounded to the nearest integer.

Table 6: Cut-score confidence intervals after item deletion: Mean

Domain	N	mean	95% CI lower	95% CI upper
Reading	15	21	20	23
Mathematics	15	15	13	18

Upon further inspection of the final impact of the proposed cut scores using the complete and weighted AMPL data, the decision was made to use the lower boundary of the 95% confidence interval for the final reading cut scores. Thus, the final reading cut score was set at 20 score points (see Table 7).

Table 7: Final MPL cut-scores

Domain	Cut-score
Reading	20
Mathematics	15

References

ACER. (2019). Minimum Proficiency Levels: Described, unpacked and illustrated. GAML6/REF/2. http://gaml.uis.unesco.org/wp-content/uploads/sites/2/2019/05/GAML6-REF-2-MLP-recommendations-ACER.pdf

Angoff, W. H. (1971). Scales, norms, and equivalent scores. In R. L. Thorndike (Ed.), Educational measurement (pp. 508-600). Washington D.C: American Council on Education.

Impara, J.C., & Plake, B.S. (1997). Standard Setting: An Alternative Approach. Journal of Educational Measurement, 34, 353-366.

Appendix A: MPL for MILO Standard setting: Described, unpacked and illustrated

SDG Goal 4.1, Indicator 4.1.1b

MINIMUM PROFICIENCY LEVEL (MPL) FOR MILO STANDARD SETTING
September 2021

Described, unpacked and illustrated

The ACER Centre for Global Education Monitoring supports the monitoring of educational outcomes worldwide, holding the view that the systematic and strategic collection of data on education outcomes, and factors related to those outcomes, is required to inform high quality policy aimed at improving educational progress for all learners.

This paper was developed as a contribution by ACER-GEM in support of the UIS-led Global Alliance for the Monitoring of Learning (GAML).

Introduction

This document has been prepared for the Monitoring Impacts on Learning Outcomes (MILO) standard setting activity. This activity will support alignment of MILO with one of the indicators of the Sustainable Development Goal in Education, SDG 4.1: -

By 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes

More specifically, the document focuses on indicator 4.1.1:

Proportion of children and young people: (a) in grades 2/3; (b) at the end of primary; and (c) at the end of lower secondary achieving at least a minimum proficiency level in (i) reading and (ii) mathematics, by sex

The MILO is an assessment of reading and mathematics achievement of children in Grades 5 to 7 in six African countries. For the purpose of the MILO standard setting activity, therefore, this document presents information about SDG 4.1.1b: the proportion of children and young people at the end of primary achieving at least a minimum proficiency level in reading and mathematics. SDG 4.1.1b has been chosen as the closest indicator for measuring the achievement of Grades 5 to 7 students.

Central to the establishment of MPLs is the work of the UNESCO Institute for Statistics (UIS), as a custodian agency for reporting against the Sustainable Development Goals in Education. UIS's role is to develop standards, methodology and guidelines to enable countries to report on the SDG education goals and indicators. The MPL descriptions in this document have been developed in collaboration with UIS and its partners.

Clarification of terms

Terminology used to distinguish the hierarchy of descriptions representing the MPLs

The hierarchy of terms is set out in **Error! Reference source not found.**, in ascending order of granularity.

Table 2 Terminology for the hierarchy of classifications representing the MPLs

Learning areas	**Reading**	**Mathematics**
Domains	Decoding Reading comprehension Aural language comprehension	Number knowledge Measurement Statistics and probability Geometry Algebra
Constructs	Precision Fluency Retrieving information Interpreting information Reflecting on information	Number sense Operations Real world problems Fractions Decimals Measurement units Area, perimeter and volume Time Data management Properties Constructions Position and direction Patterns Relations and functions

Learning areas	Reading	Mathematics
Descriptors	*For example:*	*For example:*
	Read words accurately	Count, read, write, compare and order whole numbers up to 30
	Understand the meaning of words in text read aloud	Tell time using analogue clock to the nearest half hour
	Make inferences by relating prominent piece of information to identify behaviours, feelings and events	Compare probabilities of simple events
	Establish connections between main ideas and personal knowledge	Solve problems involving ratios, proportions, and percentages

Error! Reference source not found. shows that the *learning area* of Reading has three *domains* (Decoding, Reading comprehension and Aural language comprehension). The *learning area* of Mathematics has five *domains* (Number knowledge, Measurement, Geometry, Statistics and probability, and Algebra). Within each domain there are several *constructs* (for example, Decoding has the constructs of Precision and Fluency). The *descriptors* (the last row in **Error! Reference source not found.**) represent the skills, knowledge and understandings that apply to a specific level of proficiency – that is, a specific MPL. To summarise, the learning areas, domains and constructs apply (generally) across a continuum of learning (to all the MPLs), while the descriptors apply to a specific part of the continuum (only one MPL: for example, end of primary).

Terminology and definitions used in reading and mathematics MPLs

The papers from the UIS consensus building meetings included a set of terms to help clarify the meaning of the draft MPLs (Nitko, 2018). An additional glossary was developed for the policy level workshops' Performance Level Descriptors for reading (USAID/UIS, 2019b). A selection of terms and definitions from these two sources, with slight modifications, is provided below, as used in the current document.

Reading

- Accuracy/Precision (in decoding): Correct recognition of the phonological form of a word based on its orthographic form

- Author´s intentions: may include the author´s choices (literary resources, title, words, etc.); the author´s feelings or motivations when/for writing, the author´s aim when writing, the author´s intentions when sharing a text in social media or publishing online

- Continuous texts: texts formed by sentences formed into paragraphs

- Draw conclusions: Generate conclusions from a text; generate conclusions about a topic considering different sources of information; generate conclusions about a character´s motivations or intentions

- Explicit information: information that is presented in the text

- Familiar words: words that are part of the students' vocabulary and that have been read before more than once

- Fluency (in decoding): Presupposes accuracy and speed in word recognition. It can also include qualities such as volume (reading at a volume that is adequate to the instructions given or the audience), pace (adjusting the pace to the instructions, to improve precision or comprehension), expressiveness and tone (adjusting it to the audience' characteristics, to the content and the characters)

- General knowledge: previous knowledge that the student has in reference to everyday life and world affairs

- Interpret: Extract and recognise implicit and explicit information from a written sentence or text to relate it with other information or apply it to new situations or problem solving

- Morphological clues: Clues contained in the morphological elements of word (root word, suffixes, prefixes, infixes

- Non-continuous texts: texts not in paragraph form, such as lists, tables, graphs, diagrams, indexes and forms

- Overall meaning of a text or sentence: refers to the most relevant information of the text

- Paratextual features: Features that are added to a text that can change or help the interpretation of the text. These include headings, subheadings, textboxes, illustrations, diagrams, graphs, fonts

- Prosody: The rhythm and intonation of language

- Reflect: Critically analyse and give an opinion about the information presented in a written sentence or text and the consequences the information may have

- Short texts: texts that are between 60-80 words in length

- Text types: narrative, descriptive, expository, procedural, which may be in continuous or non-continuous format

- Topic of a text: an identified theme or subject

Mathematics

- Application problems: also known as "word problems" or "story problems", these are problems that are presented in context, without explicitly telling students which mathematical operation(s) to use.

- Computation: math problems presented without context, in arithmetic form, such as 38 + 67 or 23 x 92.

- Number sense: skills such as reading, writing, comparing, ordering and estimating numbers.

Unpacking the MPLs

The remaining part of this paper presents descriptions of the MPL for SDG 4.1.1b, that is, 'end of primary', first for reading and then for mathematics. The MPLs are described and elaborated in four ways: nutshell statements, expanded statements, descriptors by construct, and sample items.

The first and briefest version is a *nutshell statement* about each learning area by educational level, intended for the general reader.

The second version is an *expanded statement*, still a summary but a more detailed one, using language that is likely to be familiar to those working in the field of education, whether at national policy or local level.

The *descriptors*, the third version, are elaborated by construct for each educational level. These use more technical language, and will be useful for educators and researchers – for example, those involved in policy linking or other methodologies to align MPLs with national evidence.

Finally the fourth version is a small set of sample items giving a more concrete indication of the degree of challenge intended for each MPL.

Reading: End of primary (SDG 4.1.1b)

Nutshell statement

Students independently and fluently read simple, short narrative and expository texts. They retrieve explicitly-stated information. They interpret and give some explanations about the main and secondary ideas in these texts, establish connections between main ideas in a text and their personal experiences.

Expanded statement

In a short, simple narrative or expository text, learners read aloud at a pace and a level of accuracy that demonstrates understanding. They use previously-taught morphological (word-level) and contextual (sentence or text level) clues to understand the meaning of familiar and unfamiliar words and to distinguish between the meanings of closely-related words. When reading silently or aloud, they locate explicit information in a paragraph. They use that information to make inferences about behaviours, events or feelings. They identify the main and some secondary ideas in a text if they are prominently stated, and recognise common text types when the content and structure are obvious. They make basic connections between the text and their personal experience or knowledge.

Constructs and Descriptors

Decoding

In a short, simple narrative or expository text, read at a pace and with a level of accuracy and prosody that meets minimum standards for fluency in the language of instruction.

Reading comprehension

Retrieving information

Use morphological or contextual clues to identify the meaning of most unfamiliar words, familiar words used in unfamiliar ways, different shades of meaning of closely related words, synonyms or basic figurative language.

Locate most pieces of explicit information when the information is prominent and found within a single paragraph containing no competing information.

Interpreting information

Establish the main idea of a text most of the time, when it is stated prominently in the text

Make simple inferences by relating two or more prominent pieces of explicitly stated information, when there no competing information, in order to identify behaviours, feelings, events and factual information.

Reflecting on information

Establish basic connections between the key ideas in a text and personal knowledge and experience.

Distinguish between text types (narrative and expository) and recognise some other common text types (for example, poetry, recipe, game instructions.) when the content and structural clues are obvious.

Sample items for end of primary

Example 1

Skill Illustration: Link pieces of related information

> **The Dwarf Lantern Shark**
>
> Are you afraid of sharks?
>
> Some sharks are harmless. The Dwarf Lantern Shark cannot hurt you. It is so small you can hold it in one hand. It is a special shark because it can glow in the dark.
>
> The Dwarf Lantern Shark lives at the bottom of very deep oceans. There is not light where they live. They make their own light.

Question: Why does the Dwarf Lantern Shark need to glow in the dark?

Target Skill: Link information from the end of one paragraph to the beginning of the next paragraph.

Explanation:

Students can link information across paragraphs when the information follows from the end of one paragraph to the start of the next paragraph. In 'The Dwarf Lantern Shark' students need to link the information about the shark glowing in the dark to the information about living in deep oceans where there is not light to understand why they make their own light.

Example 2

The Story

Sassoon had written a story. It was on top of his desk. Marco walked by, picked up the story and started to read it.

'Give it back to me,' Sassoon yelled.

'I just want to read the story,' Marco said. He held it up high.

'No, it's private. I don't want anyone to read it,' said Sassoon. He tried to grab it back.

A teacher came into the room. 'What are you two doing?' she said.

Questions

How do you think Sassoon feels at the end? (angry/embarrassed)

What is the teacher probably going to do? (give the story back, tell the boys off)

What do you think about what Marco did? (He was mean/not nice. If he wants to look he should ask first.)

Target reading strand: Reflecting

Target skill: Provide simple, personal judgements about behaviour or make predictions

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Explanation:

Students can make simple predictions about the likely outcomes of familiar situations based on their everyday knowledge. In 'The Story', Marco is clearly provoking Sassoon by reading his story without his permission. Students can predict how Sassoon is likely to be feeling. They can predict that the teacher who comes is likely to try to stop the students from fighting. They can also support an opinion about Marco's behaviour. This text is very short and simple, and the content is highly familiar so it does not require further support from illustrations at this level.

Students need to read the text themselves and then give an oral response to oral questions rather than responding to written questions.

Mathematics: End of primary (SDG 4.1.1b)

Nutshell statement

Students recognise, read, write, order, compare and calculate with whole numbers, simple fractions and decimals. Students can measure length and weight using standard units, calculate the perimeter of simple 2D shapes and area of rectangles. They read, interpret and construct different types of data displays such as tables, column graphs and pictographs and recognise, describe and extend number patterns. They can solve simple application problems.

Expanded statement

Students can add and subtract whole numbers within 1,000 and demonstrate fluency with multiplication facts up to 10 x 10 and related division facts; solve simple real-world problems with whole numbers using the four operations (consistent with the grade and performance level) and identify simple equivalent fractions; select and use a variety of tools to measure and compare length, weight and capacity/volume; understand the relationships between different units of time, e.g. seconds, minutes, hours, days, weeks, months, and years; retrieve multiple pieces of information from data displays to solve problems; recognise and name two-dimensional shapes by their simple attributes; and apply the concept of equivalence by finding a missing value in a number sentence.

Constructs and Descriptors

Number knowledge

Number sense (counting, reading, writing, comparing, and ordering)

Read, write, compare, and order whole numbers up to 10,000.

Skip count forwards and backwards using twos, fives, tens, hundreds, and thousands.

Number sense (using place value and rounding)

Round numbers up to the nearest hundred and thousand.

Operations (adding and subtracting)

Add and subtract whole numbers within 1,000.

Operations (multiplying and dividing)

Demonstrate fluency with multiplication facts up to 10 x 10, and related division facts.

Real-word problems

Solve simple real-world problems using the four operations, with the unknown in different positions.

Fractions

Identify simple equivalent fractions where one denominator is a multiple of another (e.g., $\frac{1}{3} = \frac{2}{6}$).

Compare and order unit fractions (e.g., $\frac{1}{4}$, $\frac{1}{3}$, $\frac{1}{2}$) or fractions with the same denominator ($\frac{1}{8}$, $\frac{3}{8}$, $\frac{5}{8}$).

Decimals*

Identify and represent decimal numbers up to the tenths place (e.g., identify that 0.8 is 8 tenths).

Compare and order decimal numbers up to the tenths place (e.g., sort the following decimals from high to low: 0.8, 0.3, 0.1)

Measurement

Measurement units (standard and non-standard)

Select and use a variety of tools to measure and compare length, weight, and capacity/volume.

Area, perimeter, and volume

Solve problems, including real-world problems, involving the perimeter of a rectangle using concrete or pictorial representations of units (e.g., grid squares).

Time

Tell time using an analogue clock to the nearest quarter hour.

Solve problems involving elapsed time in half hour increments within an hour (e.g., difference between 3:00 and 3:30).

Understand the relationships between different units of time, e.g. seconds, minutes, hours, days, weeks, months, and years.

Statistics and Probability

Data management

Complete missing information in simple data displays using data arranged into categories, with some support provided (e.g., labelled horizontal and/or vertical axes).

Retrieve multiple pieces of information from data displays to solve problems (e.g., calculate a total represented by multiple bars on a graph).

Geometry

Constructions

Compose a larger two-dimensional shape from a small number of shapes in more than one way (if possible).

Decompose a larger two-dimensional shape into a small number of shapes in more than one way (if possible).

Recognise parallel and perpendicular lines.

Properties

Recognise and name two-dimensional shapes by their attributes (e.g., their lines and informal angle properties).

Recognise the congruence and similarity of two-dimensional shapes (e.g., shapes that have been reflected, translated, rotated, enlarged, or reduced).

Position and direction

Follow more complex directions and/or give simple directions to a given location (e.g., go straight, turn right at the corner with the tree, turn left at the next corner, keep going to the green house).

Algebra

Patterns

Describe numerical patterns as increasing by a constant value but starting at a number that is not a multiple of the value of the pattern (e.g., the pattern 5, 8, 11, 14 starts at 5 and goes up by 3).

Relations and functions

Demonstrate understanding of equivalence by finding a missing value in a number sentence using addition or subtraction of numbers within 100 (e.g., 23 + __ = 29).

Example 1

Wet Days

Domain	Construct	Descriptor
Statistics and Probability	Data management	Retrieve multiple pieces of information from data displays to solve problems (e.g., calculate a total represented by multiple bars on a graph).

Task solution: The fourth option is selected (March and June)

Commentary: This task invites students to interpret a simple column graph containing counts for several data categories; requires students to interpret the language of 'two months together' and formulate this mathematically using the operation of addition; to identify and extract the relevant information from the data representation; then to perform appropriate calculations numerically or visually to identify the required solution. The students can use the

appropriate operation (addition) or use an appropriate visual comparison strategy, to directly identify combinations of months that provide the required solution of a total of 13 days, or eliminate some options that do not provide the required solution. The sequence of actions required involve devising and following a multi-step strategy that includes interpretation, formulation and mathematical processing.

Example 2

Goal scoring

In the first half of a game, the Tigers score 1 goal and the Lions score 4 goals.
In the second half, both teams score the same number of goals.
At the end of the game, 9 goals have been scored altogether.

How many goals did each team score in the second half?

_____ goals

Domain	Construct	Descriptor
Number knowledge	Application problems	Solve simple real-world problems using two or more of the four operations.

Task solution: 2

Commentary: This task requires students to understand what the question is asking, develop strategies to enable them to solve the problem, then carry out those strategies and calculations to determine the answer. Students may choose to solve the problem using materials, mental methods or written algorithms. They may use concrete materials such as counters to represent the goals scored. They may use known number facts (such as bonds to 9), or they may write down the numbers and develop number sentences to solve each step of the problem.

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USAID/UIS (2020a) Global Performance Descriptors - Mathematics v8. USAID/UIS (draft document)

USAID/UIS (2020b) Global Performance Descriptors - Reading v8. USAID/UIS (draft document)

Appendix B: Impact review participants

List of external participants who attended in addition to the ACER and UIS participants.

Recommended by	Name	Affiliation
CONFEMEN	Hilaire Hounkpodote	PASEC
CONFEMEN	Ousmane Birda	PASEC
CONFEMEN	Labass Lamine Diallo	PASEC
CONFEMEN	Bassile Tankeu	PASEC
SEAMEO	Sar Sarin	Ministry of Education, Youth and Sport of Cambodia
SEAMEO	Khou Hav	Ministry of Education, Youth and Sport of Cambodia
SEAMEO	Tol Pagna	Ministry of Education, Youth and Sport of Cambodia
SEAMEO	On Sengtry	Ministry of Education, Youth and Sport of Cambodia
SEAMEO	Wan Raisuha Binti Wan Ali	Ministry of Education of Malaysia
SEAMEO	Norahsikin Binti Harun	Ministry of Education of Malaysia
SEAMEO	Nurharani Binti Selamat	Ministry of Education of Malaysia
SEAMEO	Noor Hazlin Binti Mustafa	Ministry of Education of Malaysia
SEAMEO	Mohd Syazwan Bin Jonit	Ministry of Education of Malaysia
SEAMEO	Ng Poi Ni	Ministry of Education of Malaysia
SEAMEO	Kumaresan A/L M. Subramaniam	Ministry of Education of Malaysia
SEAMEO	Wanaja A/P Ratnam	Ministry of Education of Malaysia
SEAMEO	Heidi B Macahilig	Philippine Normal University

Recommended by	Name	Affiliation
SEAMEO	Nguyen Kim Phuong	Ministry of Education and Training of Vietnam
SEAMEO	Tran Thi Huong Trang	Ministry of Education and Training of Vietnam
LLECE	Claudiaa Guichard Guichard	
LLECE	Constanza Iglesias	
LLECE	Carla Barrios	
LLECE	Carmen Gloria Bascuñán	
National team - Zambia	Shadreck Nkoya	National Examination Council of Zambia
National team - Zambia	Shakazo Mzyece	National Examination Council of Zambia
Maths - Zambia	Zanzini B. Ndhlovu	University of Zambia
Reading - Zambia	David Mwanza	University of Zambia
National team - Kenya	Asumpta K. Matei	Kenyan National Examination Council
National team - Kenya	Musa Kipchirchir	Kenyan National Examination Council
Maths - Kenya	Bernard Muhalia	Kenyan National Examination Council
Reading - Kenya	Rachel Ngumbao	Kenyan National Examination Council