SDG 4 Reporting:

Data alignment

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GAML4/5

The UNESCO Institute for Statistics (UIS), through its Global Alliance to Monitor Learning (GAML), is working on an approach to monitoring learning outcomes for Indicator 4.1.1 of the UN's Sustainable Development Goal 4 (SDG 4): Quality Education:

> 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. (Inter-Agency and Expert Group on SDG Indicators, 2016)

Monitoring progress against Indicator 4.1.1 will require the reporting of student outcomes at several different stages of learning in a broadly consistent way across education systems, to enable meaningful international dialogue about learning progress and how it may be supported.

Learning and what is measured about learning varies widely across local contexts. Agreeing on common contents and competencies of reference is a first step. Education systems make independent interpretations and decisions about what learning means, how it is described in curriculum, and how it is assessed and reported.

Reporting mechanisms: the UIS RS

UIS Reporting Scales (RS) are the mechanisms used to enable a consistent way of reporting on SDG 4 Indicator 4.1.1. The UIS RS are descriptive scales of learning progress in reading and mathematics that have been drafted based on existing international, regional and national learning assessment programmes and analysis of national curricula. The scales support meaningful shared interpretations of educational progress in reporting.

Data alignment and reporting process

The process of data alignment will enable education systems to examine and report on the current level of alignment of assessment programmes with the UIS RS in a way that is clear, efficient and consistent.

Objective

The process of data alignment has been developed by the UIS and its technical partner, the Australian Council for Educational Research's Centre for Global Education Monitoring (ACER-GEM), to support work on SDG 4 reporting and capacity development. Data alignment sets out a suite of options to help education systems to use the UIS RS in Indicator 4.1.1 reporting.

Data Alignment Record Tool

The Data Alignment Record Tool (DART) will enable information from each of the steps below to be recorded, and used to generate a series of statements about the alignment of the content of the assessment programme with the UIS RS. These statements will be incorporated into SDG 4 reporting, and may also be used to inform the country's assessment improvement plan, if desired. For example, DART will include a facility for entering the results of the analysis of items for each strand, in terms of their coverage across types of items.

Main steps in reporting using the UIS RS

The steps set out below show how countries can currently align their assessment programmes with the UIS RS. This will be supplemented over time with other options to link assessment programmes to the UIS RS for the purposes of Indicator 4.1.1 reporting.

Step 0. Precondition – Country awareness

In this step, the country (as represented by the relevant ministry in the education system) is to gain familiarity with the definition and description of the UIS RS, the content coverage, domains, strands and levels. The Learning Progression Explorer tool will enable countries to explore the reporting scales.

Step 1. Country preparation of database and materials

In this step, the country (as represented by the relevant ministry in the education system) compiles their cross-national and/or national learning assessment framework, test blueprint, items, item responses, micro-database, codebook, operational manual, and assessment results.

Step 2. Conceptual alignment

The UIS RS has four key components with which an assessment programme may align:

- *Domains:* The UIS RS provides a description of learning progression in the learning domains to be assessed (for example, reading and mathematics).

- *Strands:* Within each domain, the UIS RS is organised into strands that reflect the breadth of knowledge, skills and understandings that are at the core of each domain. In reading, the four strands cover constrained skills, retrieving information, interpreting information and reflecting on the form or content of the text. The three strands in mathematics cover numbers and algebra, measurement and geometry, and data and probability.

- *Levels:* The UIS RS identifies levels of learning progress for each domain, based on a continuum of development for each strand, and for the domain as a whole (for example, difficulty according to learning levels and level of proficiency).

- *Benchmarks:* Benchmarks for minimum proficiency in reading and mathematics will be established on the UIS RS for the purpose of SDG 4 reporting.

Conceptual alignment therefore includes three steps – domain alignment, strand alignment and level alignment. These steps are described below:

Domain alignment

- This step involves examining how the relevant domain is defined and operationalized in the assessment programme.

- Reference to curriculum documents and assessment frameworks may assist in this classification process. For example, countries can use the UIS Content Reference Framework (CRF) to examine the overlap between a national curriculum and content covered in the scales. Work to align the CRF and the UIS RS is currently underway.

- If the broad definition of the domain in an assessment programme is aligned with the UIS RS, it is possible to proceed to the next step, and examine the strands.

Strand alignment

The second step requires the items used in the assessment to be categorized according to the strands of the UIS RS. This process will be made easier if, in a first step, the strands (or subdomains) of an assessment programme are broadly aligned with the UIS RS descriptors.

- Strand alignment also involves detailed examination of the items used in the assessment, to ensure that the breadth of items in each strand provides appropriate coverage of the UIS RS domain.

Level alignment

This step involves categorizing the items in the assessment for each strand, according to the different levels of learning progress they represent and the definition of the levels of proficiency in the assessment. It involves various steps:

a. *Scale mapping* involves aligning the overall scale of achievement between the assessment programme and the UIS RS.

b. *Item mapping* involves a qualitative rating of a selection of items compiled to illustrate different levels of learning progress on the assessment programme, relative to the UIS RS illustrative items at similar levels.

c. *Benchmark mapping* involves mapping the benchmarks defined on the UIS RS to any benchmarks of proficiency that have been set on the scale used in the assessment programme.

Step 3: Assessment of procedural consistency

This step will enable the UIS to collect some basic procedural information from education systems about the data that are provided against Indicator 4.1.1, to understand the level of confidence with which results can be reported. This information includes:

a. *Whether the sample is representative of the national population*

This includes representation of all major population groups for which educational outcomes may vary (such as socioeconomic, language or disability groups), and geographic coverage across metropolitan, rural/regional and remote locations.

b. *Whether the response rate is appropriate for the chosen sampling method*

UIS will not set a threshold response rate for Indicator 4.1.1 reporting, but will aim to obtain information about the response rate from each reporting education system.

c. *Whether translation procedures ensure consistency across language groups*

Where a programme is administered in multiple languages (for example, in an education system with students from multiple language groups), it is important to ensure that variation in test results across language groups does not result from inconsistencies in the test instrument arising from translation.

Mechanisms for reporting on these three key aspects of procedural consistency will be available through the Data Alignment Record Tool (see above).

Step 4: Validation and reporting

Countries have a responsibility to educate their population and report on their population's learning against Indicator 4.1.1. This responsibility includes validation of the interpretations of large-scale assessment performance results used for Indicator 4.1.1, and submitting the most relevant possible information for global reporting. This validation process needs to include most critical components of the conceptual alignment and the assessment of procedural consistency.

In the validation process, a qualified evaluator from the regional assessment agencies will also consider whether the data submitted are adequate or of reasonable quality to be included in the database for global reporting.

Step 5: Improvement plan and capacity development

The data alignment process will generate statements about any limitations in alignment with the UIS RS, including:

- Any domains or strands in which coverage is limited.
- Any differences in the way proficiency levels are defined.
- Any differences in the points at which minimum proficiency benchmarks are set.

This information is intended to assist a country in working towards improved accuracy in reporting. UIS's work programme through the Global Alliance to Monitor Learning includes additional tools and processes to assist countries in planning capacity-building activities.