



United Nations
Educational, Scientific and
Cultural Organization



UNESCO
INSTITUTE
FOR
STATISTICS

Measurement strategy and action plan for SDG Target 4.6

Proposal by GAML Task Force 4.6 (OECD proposal)

Global Alliance for Monitoring Learning
Fourth meeting
28-29 November 2017
Madrid, Spain

GAML4/15



**SDG Target 4.6:**

by 2030, ensure that all youth and a substantial proportion of adults, both men and women, achieve literacy and numeracy

Introduction

Progress to the target will be measured by Indicator 4.6.1: Proportion of population in a given age group achieving at least a fixed level of proficiency in functional (a) literacy and (b) numeracy skills, by sex.

This is further defined as: The proportion of youth (aged 15-24 years) and of adults (aged 15 years and above) have achieved or exceeded a given level of proficiency in (a) literacy and (b) numeracy. The minimum proficiency level will be measured relative to new common literacy and numeracy scales currently in development.

Key Issues

In developing a strategy to monitor progress towards Target 4.6, there are two main sets of issues. The first set are conceptual and the second, operational.

Conceptual issues

Definition of literacy and numeracy

The main issue at the conceptual level is that of agreement on the definitions and dimensions of the constructs of (adult) literacy and numeracy to be measured by indicator 4.6.1.

The UN's *Principles and Recommendations for Population and Housing Censuses Revision 3* define 'literacy' in the following way (UN, 2015, p236):

Literacy has historically been defined as the ability both to read and to write, distinguishing between "literate" and "illiterate" people. A literate person is one who can both read and write, with understanding, a short, simple statement on his or her everyday life. An illiterate person is one who cannot, with understanding, both read and write such a statement. Hence, a person capable of reading and writing only figures and his or her own name should be considered illiterate, as should a person who can read but not write as well as one who can read and write only a ritual phrase that has been memorized. However, a more modern understanding referring to literacy as a continuum of skills, levels, domains of application and functionality is now widely accepted.

No equivalent definition of 'numeracy' exists.

In terms of the conceptualisation of literacy and numeracy as a 'continuum', the situation in the field of adult assessments differs considerably from that of assessments of school age children. There are

a number of international or cross-country comparative assessments of school age children reach with their own frameworks. However, there are only two cross-country programmes of comparative assessment of adult literacy and numeracy that are currently in place – the Programme for the International Assessment of Adult Competencies (PIAAC) and the World Bank’s STEP assessment which uses a version of the PIAAC literacy assessment. The PIAAC assessment frameworks draw on a theoretical tradition which has underpinned the conceptualisation of literacy and, subsequently, numeracy in the International Adult Literacy Survey (IALS), the Adult Literacy and Life Skills Survey (ALL) and UNESCO’s Literacy Assessment and Monitoring Programme (LAMP). The conceptualisation of literacy and numeracy in PIAAC (and its predecessors) is closely related to that on which many international school-based assessments such as PISA, TIMMS, PIRLS and PASEC are based. The PIAAC literacy framework includes a reflection on the measurement of the skills that are preconditions for reading comprehension (described as reading components): print vocabulary knowledge, sentence processing and fluency.

In this context, there are strong reasons to consider the adoption or adaptation of the conceptual frameworks of the Programme for the International Assessment of Adult Competencies (PIAAC) as the basis for the development of a measurement framework for SDG target 4.6. The PIAAC frameworks represent well developed frameworks that have been validated in cross-national settings, including several middle and low income countries. In addition, given that they form the conceptual basis for the only existing international comparative assessments of adult literacy (PIAAC and STEP) and numeracy (PIAAC). If only for this reason, they must form the basis of any reflection on the conceptual framework for the measurement of target 4.6.

The PIAAC frameworks do not, however, cover ‘writing’.

Alternatively, the development of new conceptual frameworks defining literacy and numeracy could be undertaken. However, any new frameworks would need to be compatible with the PIAAC frameworks. PIAAC is and will continue to be the main vehicle used to assess adult literacy and numeracy in the high income countries. To the extent that STEP continues, the PIAAC instruments will also continue to be the source of high quality information about literacy in several low and middle income countries.

Reporting thresholds

The extent of variation in the literacy and numeracy proficiency of the adult population in different countries represents a significant challenge for the establishment of benchmark levels that will make sense globally. The challenge is to set a benchmark that is far too high to be achieved by a large number of countries or alternatively one that is far too low to have any meaning for many countries.

Writing as part of literacy

Writing is included in the definition of ‘literacy’ cited above. However, there is no well-developed conceptual framework that could guide the assessment of writing in an international comparative setting and there are formidable practice challenges to assessing it. A position on the assessment of writing as part of literacy in the context of the SDGs needs to be developed.

Operational issues

Vehicles for assessment

The primary operational issue is that of determining the possible vehicle(s) for the collection of information on literacy and numeracy.

Four main options exist:

1. Existing international survey programmes such as PIAAC and STEP
2. New international comparative programmes
3. National literacy studies
4. Omnibus household surveys.

For younger cohorts, it may be possible to use the results from assessments of secondary school students (e.g. PISA or TIMSS) to estimate proficiency. This assumes that there is a reasonably close relationship between the proficiency of a cohort at the age of 14-15 and its proficiency at older ages¹. Given growing participation in studies such as PISA, this may be an option for middle and low income countries in which data about adults is lacking or of poor quality.

1. *International assessment programmes*

At the moment, PIAAC and STEP are the only two international comparative studies that collect information on literacy and numeracy. This situation is not likely to change in the foreseeable future. A new cycle of PIAAC is about to begin with data collection scheduled for 2021-22. It is possible that there may be additional rounds of PIAAC should additional countries wish to participate. In particular, a round of PIAAC for middle income countries may be possible with data collection in the period 2025-27 if there is sufficient interest from countries and donor organisations. At this point the STEP measurement study continues to be open to additional countries.

The cost and complexity of PIAAC and STEP makes it unlikely that more than a small number of low and middle income countries will participate in these programmes.

2. *New international comparative assessment studies*

The establishment of a new international comparative assessment of literacy and numeracy could be considered. This would represent an option for the longer-term. The feasibility, costs and benefits of such an option would be need to be fully explored.

3. *National studies*

Dedicated national literacy and numeracy assessments exist. However, national assessments have been undertaken by a relatively small number of countries. They are also often based on country specific conceptual and assessment frameworks that make comparison of results with other surveys

¹ Obviously, the proportion of a cohort attending school would need to be taken into account.



extremely difficult. In addition, the variation in the conditions under which studies are implemented (sampling, response rates, quality control) also has an impact on comparability. If comparability is a goal, countries planning national studies should be encouraged to join existing programmes or undertaking linking equating studies with existing international programmes.

4. Omnibus household surveys

Omnibus or multi-purpose household surveys such as DHS, MICS, living standards surveys and censuses usually collect some information regarding literacy. The validity of this information (based on very simple reading tests or respondent reports) is largely unknown. It may, however, be possible, to develop a short assessment module that could be administered as part of these studies to gain better information on the literacy proficiency of the target populations of these studies.

Summary

A realistic and pragmatic strategy for the collection of data on literacy and numeracy needs to recognise the fact that for many countries, the chance that direct assessments of literacy and numeracy proficiency that provide comparable information will be implemented between now and 2030 is low. More countries will participate in such assessments, but for reasons of cost, complexity and capacity coverage, particularly of low income countries is likely to be limited.

In addition, data collection in large scale literacy studies is usually carried out over relatively long cycles because of high costs and slow rates of change in the proficiency of the adult population. PIAAC collects data on a 10 year cycle for example. Low frequency of collection means that it is unlikely that there will be more than one observation for any single country over the period 2018-2030 and that this observation may not be very close to the end of the SDG reporting period (2030). For example, for the countries that participate in PIAAC, there will only be one observation available for any single country between now and 2030. In the case of countries participating in the upcoming 2nd cycle of PIAAC (the majority of high income countries), the information available will relate to 2021-22.

It may be possible to develop a short literacy assessment that was linked to the PIAAC scales could be administered in conjunction with other household surveys in low income countries such as the MICS and DHS programmes. The OECD is currently proceeding with the development of such a test. However, the challenges of this should not be ignored, primarily that of empirically establishing the link between each of the languages in which the instruments would be administered and the PIAAC scales. In addition take-up would be dependent upon the interest of the sponsor of the survey programme.

Assuming the above, it would also be important to review the information on literacy and numeracy collected in household survey programmes such as national censuses, DHS, MICS and other studies such as living standards surveys. This would cover issues such as the type of measures used and their validity, reliability and comparability. It is possible that greater harmonisation of information collected in such programmes as well as improvement in the design of the measures could considerably improve the quality of data from such studies.

At least for young cohorts (e.g. 15-24 year olds), it may be possible to use results from school-based assessments of lower secondary students (e.g. PISA, TIMSS) as the basis for estimations of proficiency in reading and mathematics in the event that good quality literacy and numeracy data from other sources is not available. However, the utility of such a strategy would be lower in those countries with relatively low rates of participation in school of 15 year olds.

A strategy to improve the quality and coverage of information on the proficiency of the adult population in literacy and numeracy available globally would need to have several components:

1. Encourage countries to participate in projects such as PIAAC and STEP
2. Review information on literacy and numeracy collected in census collections and household surveys with a view to improving data quality and comparability
3. Explore the use of results from assessments of secondary school students (e.g. TIMSS and PISA) for the estimation of proficiency among youth cohorts.

Work programme

A work programme for Taskforce 4.6 could be based around the following pieces tasks:

- Develop a position paper on the definition and description of the constructs of literacy and numeracy; options and issues
- Develop Reporting thresholds. Options and issues, analysis of PIAAC and STEP data.
- Review of literacy and numeracy information collected in multi-purpose household surveys – possibilities for improving data quality and comparability
- Prepare a paper identifying vehicles for the collection of information on literacy and numeracy – periodicity, costs, other constraints
- Explore the possibility of using results from assessments of secondary-school students for estimation of literacy and numeracy levels for youth cohorts.

Possible Projects

Defining Literacy and Numeracy

The objective of this paper would be to discuss the options for developing a conceptual framework for the measurement of literacy and numeracy for the purposes of indicator 4.6.1. This would include identifying and evaluating existing frameworks used in national and international assessments. It would, in particular, explore, the advantages and disadvantages of adopting or adapting the PIAAC frameworks as the basis for defining and describing literacy and numeracy for the purposes of.

The paper could draw on document analysis, the inventory of literacy assessments and the results of an expert meeting on this topic proposed for early November 2017.

Developing reporting thresholds

The purpose of this paper would be to provide a theoretical and empirical background to the discussion of reporting thresholds. In particular, it would:

- Discuss the possible approaches (e.g. expert judgement, statistical analysis) that could be used to establish and justify a benchmark level or levels on a scale such as that of PIAAC² as well as the consequences of establishing a normative benchmark.
- Use data from PIAAC and STEP to examine what benchmark levels could make sense across the range of countries in the world given the variation in proficiency in literacy and numeracy proficiency among adults
- Assess the likely change in literacy levels among the adult population that is likely to be observed over the next 12 years (i.e. to 2030) under reasonable assumptions and the subsequent consequences for countries of the choice of different thresholds. .

² This would be used as an example due to the fact that empirical data are available. It would imply no judgement about what reporting scale should be used.

Review the quality of literacy data collected in household surveys on literacy and numeracy

The purpose of this paper would be to review the information on literacy and numeracy collected in household surveys in terms of its validity, reliability and comparability. This would include examining the validity of the single sentence reading test used in the MICS and DHS programmes as well as the validity and comparability of respondent reports on their own or others reading and mathematics skills as well as their reading practices. The analysis would examine validity in relationship to the construct of literacy (particularly the threshold separating readers from pre-readers) as well as the empirical evidence regarding the relationship of simple and more developed direct assessments and respondent reports and direct assessments. The outcome would be recommendations regarding steps to take to improve the quality of literacy and numeracy data in household surveys.

Using school-based assessments to estimate the literacy and numeracy proficiency of youth cohorts

The growing coverage of assessments such as PISA provides information on the literacy and numeracy proficiency of 15 year olds on a common scale that could be used to estimate proficiency of youth cohorts (e.g. 15-24 year olds). As can be seen from the table below, in 2020, information will be available regarding the proficiency in reading and mathematics at the age 15 of cohorts aged 17, 20 and 23 in those countries that participated in PISA 2012, 2015 and 2018. This information could be used as the basis for estimating the proficiency (on the PISA scales) of the 15-24 year old cohort in those countries. The objective of this paper would be to examine the kinds of assumptions that would need to be made to do this (for example regarding the out of school population) and the likely robustness of estimates developed. To the extent that data from national assessments are available for countries that do not participate in cross-national assessments, consideration could be given to using these data as well.

Table 1. PISA cohorts: age in 2020 and 2030

Data collection	Age in 2020	Age in 2030
2000	36	46
2003	33	43
2006	30	40
2009	27	36
2012	23	33
2015	20	30
2018	17	27
2021		24
2024		21
2027		18
2030		15

References

United Nations (UN) (2015), *Principles and Recommendations for Population and Housing Censuses Revision 3*, Department of Economic and Social Affairs Statistics Division, T/ESA/STAT/SER.M/67/Rev.3