



Using data to improve learning: Engaging with policy and reform

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Acknowledgement of traditional owners

We acknowledge the traditional owners of the land on which we meet today, the people and pay our respect to elders past, present and future.

Setting the scene: Perspectives on purposes and use of data

Global learning crisis



258 million

children, adolescents and youth
are out of school



million

children and adolescents aren't
achieving minimum proficiency
levels in reading and maths



primary school students in
East and Southeast Asia doesn't
meet minimum proficiency levels in
reading and maths

Improving learning

The Australian Council for Educational Research is an independent, not-for-profit research organisation.

We conduct, support and use research to improve student learning.



Global approach, local impact

- Strengthen education systems
- Draw on global standards and experience
- Work alongside national governments and agencies
- Guide partners to respond to policy priorities and local needs
- Internationally recognised for large-scale learning assessments
- Expert educational researchers
- Improve learning outcomes for LMIC

How can we use data?

- High-quality data on student learning enables government and policymakers to better understand learning
- Data helps teachers and schools understand what student know and can do
- Without understanding data how can we engage in policy reform efforts?
- Teaching is complex – Student achievement is influenced by much more than an individual teacher
- Teachers need to know and understand their students – what activities work to support learning?
- Assessment data gives teachers an insight into strengths and weaknesses of their lesson plans or learning activities

Four key aspects of learning

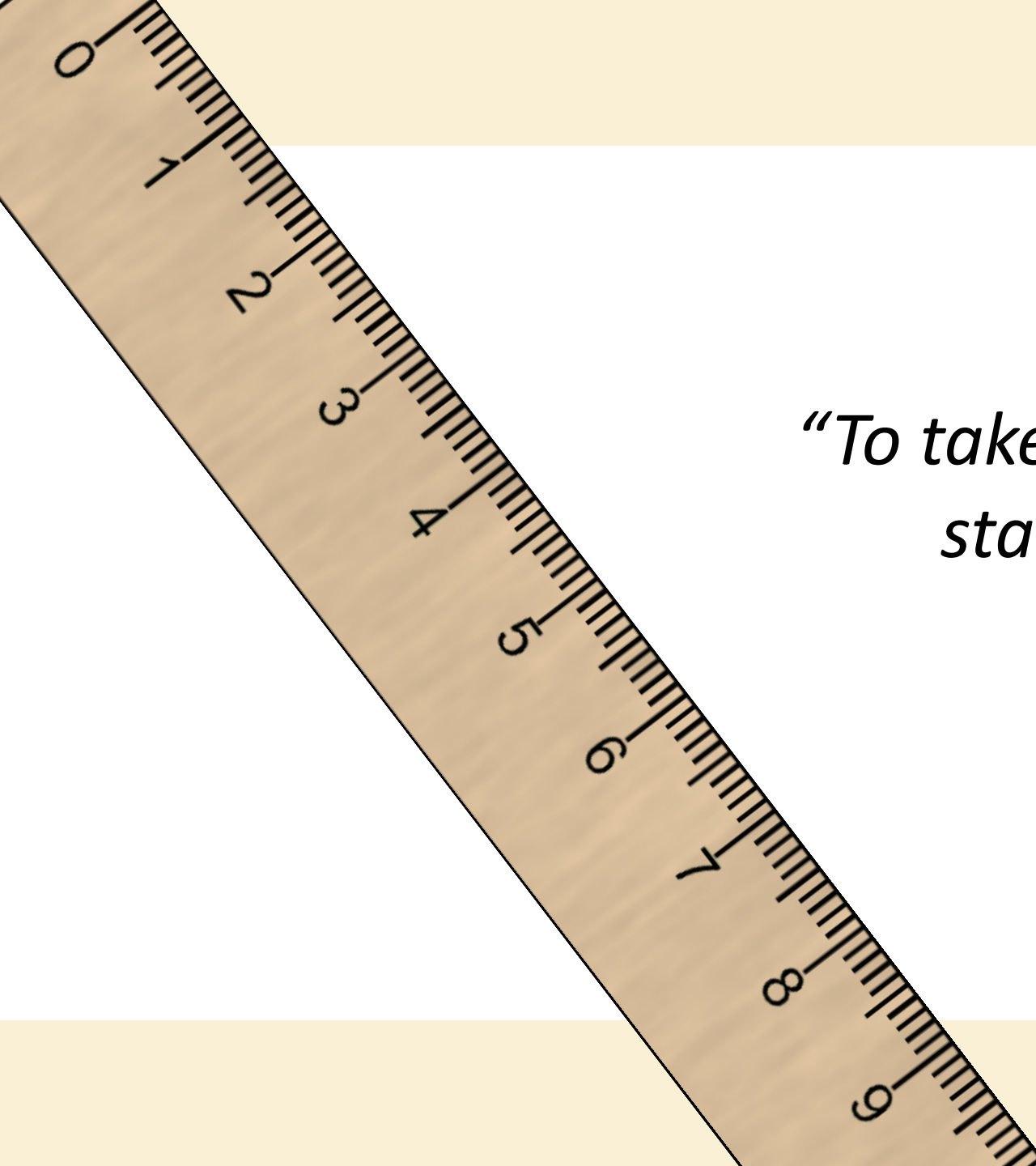
Defining learning

Understanding learning

Measuring learning

Improving learning

Defining and measuring learning



*“To take learning seriously,
start by measuring it.”*

World Development Report (2018).

Supporting global efforts to DEFINE LEARNING

*Global Alliance to Monitor Learning – developing common descriptions of **Minimum Proficiency Levels**.*



READING



*End of **Lower Secondary***

*End of **Primary***

*End of **Lower Primary***

MATHEMATICS



*End of **Lower Secondary***

*End of **Primary***

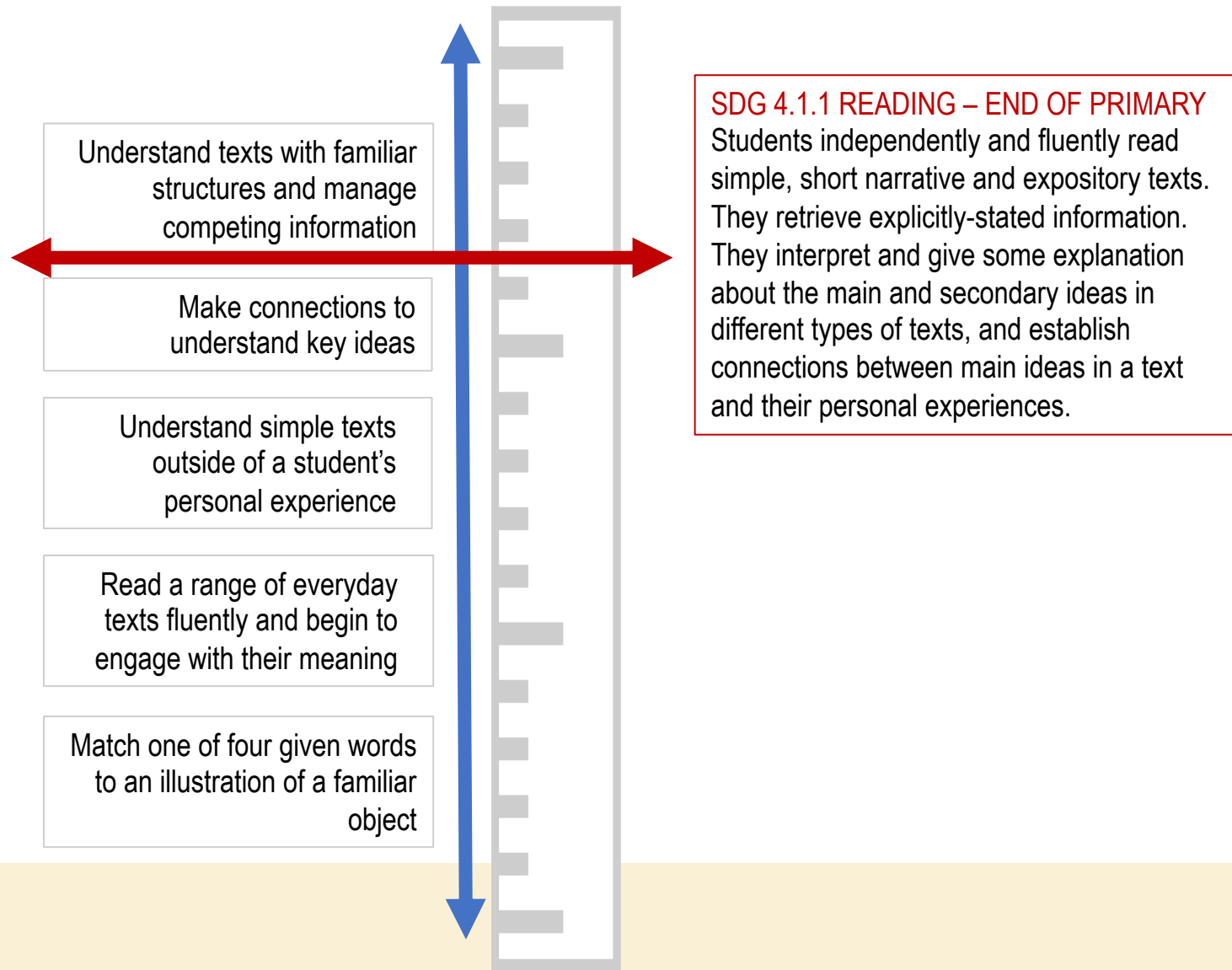
*End of **Lower Primary***



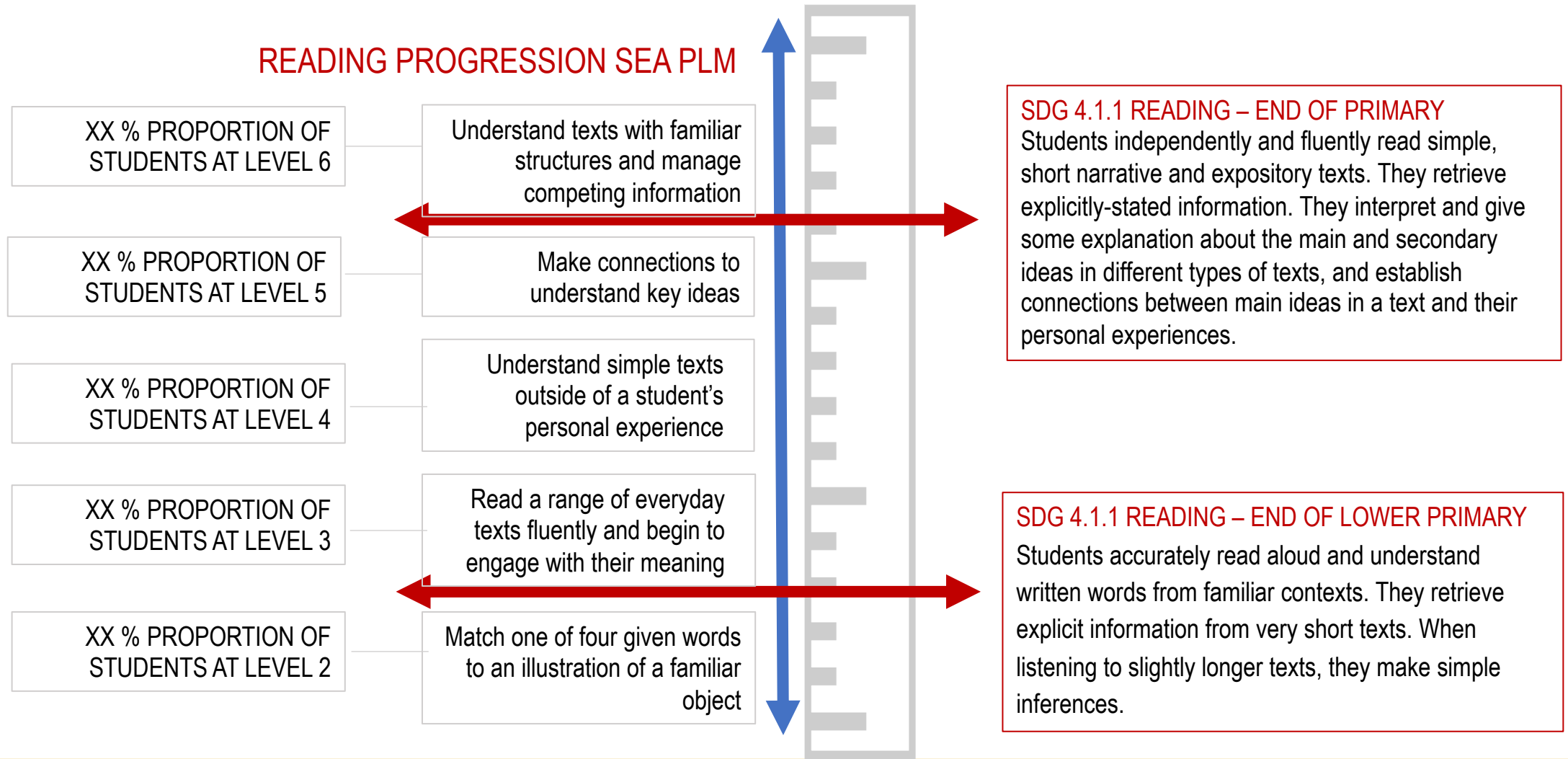
| 4.1.1 terms | Proposed Definition MATHEMATICS | Proposed Definition READING |
|------------------------|---|---|
| End of Lower Secondary | Students demonstrate skills in computation with fractions, decimals, rates, ratios, percentages and integers. They apply geometric relationships and formulae such as area, surface area and volume, Pythagorean theorem, angle sum of a triangle. They interpret and construct, a variety of data displays and calculate measures of central tendency. They make use of algebraic representations of linear relationships. They can use their mathematics knowledge to solve application problems. | Students retrieve and connect multiple pieces of related information across sections of texts to understand key ideas. They make straightforward inferences when there is some competing information. They reflect and draw conclusions based on a variety of text types. |
| End of Primary | 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. | Students independently and fluently read simple, short narrative and expository texts. They retrieve explicitly-stated information. They interpret and give some explanation about the main and secondary ideas in different types of texts, and establish connections between main ideas in a text and their personal experiences. |
| Grade 2/3 | Students recognise, read, write, order and compare whole numbers up to 100. They demonstrate computational skills involving the processes of addition, subtraction, doubling and halving for whole numbers within 20. They recognise and name familiar shapes and describe location in a space using simple language. | Students accurately read aloud and understand written words from familiar contexts. They retrieve explicit information from very short texts. When listening to slightly longer texts, they make simple inferences. |

DESCRIBED PROFICIENCY SCALES

READING



MEASURING LEARNING REPORTING PROGRESS IN STUDENT GROWTH



DESCRIBED PROFICIENCY SCALES

Measuring learning

A common definition of learning, which is underpinned by a common learning progression means we can:

- Set common benchmarks for learning across different contexts;
- Define policy targets for learning across contexts and overtime;
- Understand learning progress of systems as well as individual students



Measuring learning

- DPS provide a conceptual and empirical dimension to reporting of student learning
- Allows us to know where students are at AND support them to move to their next stage of learning
- Helps to recognise disparity of learning outcomes
- The DPS helps us to UNDERSTAND and IMPROVE learning



Understanding learning

Understanding learning

Cognitive instruments help **measure** achievement

Contextual instruments help **explain** achievement

Contextual data collections:

- Help us understand the contexts in which learning take place
- Help us explain variation in achievement
- Can inform evidence-based policy-making in education

ACER's role in working with contextual instruments from large scale educational surveys

International surveys

IEA ICCS IEA ICILS
OECD PISA OECD IELS
OECD SSES IEA REDS

Regional surveys

SEA-PLM
PILNA

National surveys

MTEG-Afghanistan
MY-EQIP
Laos teacher study

Different types of contextual factors

Antecedents and processes at four different levels of contextual influence from the Southeast Asia Primary Learning Metrics Study (SEA-PLM) Assessment Framework

(UNICEF, 2017, p44).

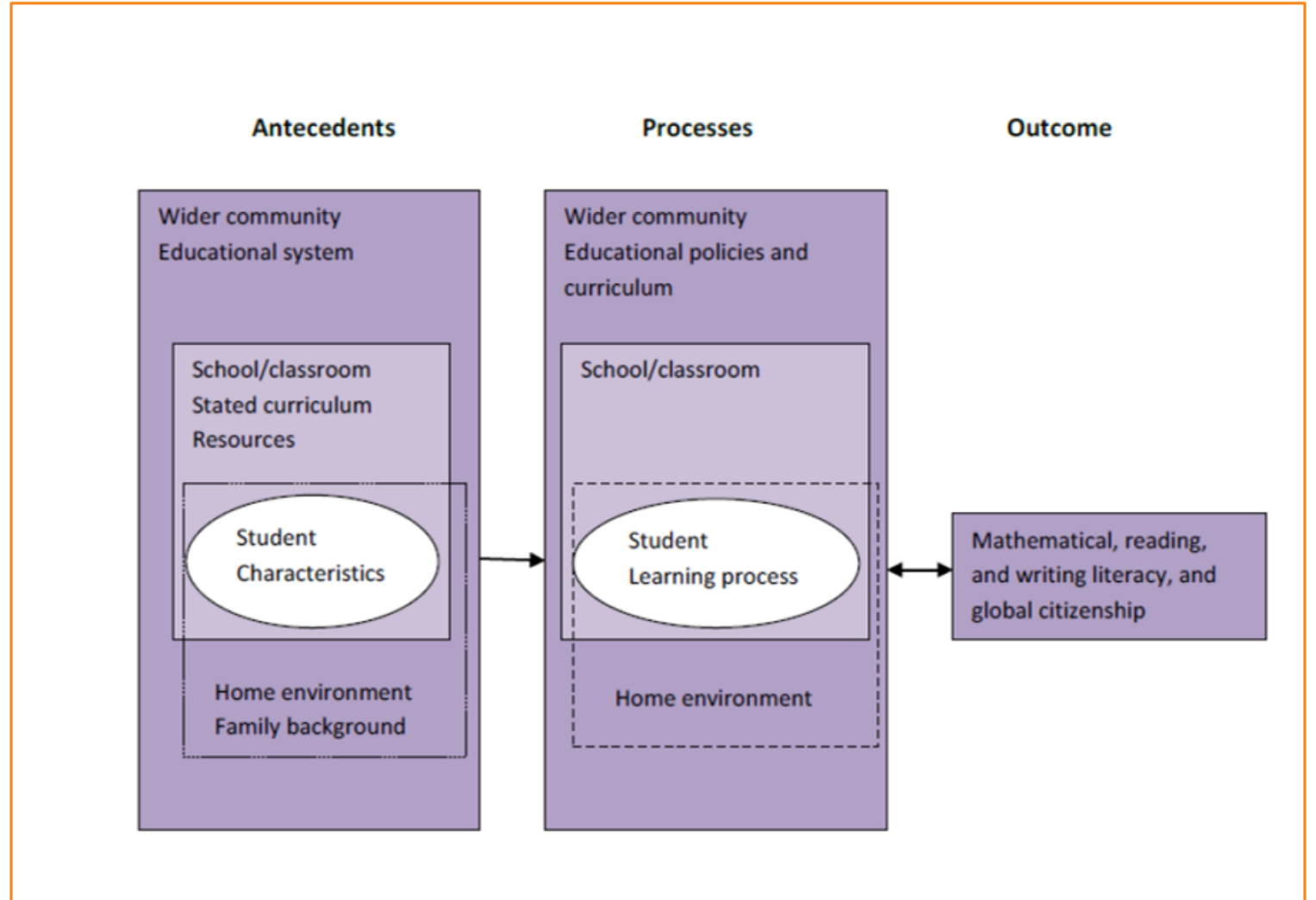
| Level of ... | Antecedents | Processes |
|------------------|---|---|
| Wider community | For example, structure of education systems | For example, status of numeracy and literacy in the national curriculum |
| School/classroom | For example, school characteristics | For example, teaching policy and practice |
| Student | For example, sex and age | For example, individual learning activities at school |
| Home environment | For example, home resources | For example, learning at home |

Mapping the contexts for learning

Interaction between antecedents, processes and outcomes

Example from SEA-PLM Assessment Framework

(UNICEF, 2017, p43).



Influences on learning at the wider community level

Educational system

- Structure of educational system
- Policies related to education
- Curriculum related to learning area
- Teacher training in learning area
- Assessment in learning area

Local community level

- Neighbourhood facilities
- Neighbourhood demographic and social composition
- Urbanization
- Community involvement in supporting schools
- Availability of child-care settings

Example of a system level factor – Teacher training (from ICCS 2016)

Mandatory pre-service and in-service teacher training in topics related to civic and citizenship education from the IEA International Civic and Citizenship Education Study (ICCS) 2016 International Report

(Schulz et al., 2018, p37).

| Country | Civic and citizenship education mandatory part of preservice/initial teacher education? | | | In-service, continuing education, or professional development for civic and citizenship education offered? | | |
|-------------------|---|--|--|--|--|---|
| | Specialist teachers | Teachers of subjects <i>related</i> to civic and citizenship education | Teachers of subjects <i>not related</i> to civic and citizenship education | Specialist teachers | Teachers of subjects <i>related</i> to civic and citizenship education | Teachers subjects <i>not related</i> to civic and citizenship education |
| Belgium (Flemish) | | ● | ● | | ● | ● |
| Bulgaria | | ● | | | ● | ● |
| Chile | | ● | | | ● | |
| Chinese Taipei | ● | ● | | ● | ● | |
| Colombia | | | | ● | ● | ● |
| Croatia | | | | | ● | ● |

Influences on learning at the school/classroom level

School level

Characteristics of school leaders
School resources
School policies
School size/type/funding
Teacher professional development opportunities

Classroom level

Classroom resources
Classroom practices
Classroom climate
Teacher experience and training
Teacher self-efficacy

Example of a school level factor – Monitoring of teacher attendance (from MTEG Afghanistan)

Differences in achievement for those students attending schools where the monitoring of teachers attendance is recorded, from MTEG Class 6 School factors in Afghanistan report

(Friedman et al., 2016, p. 19).

| | Monitoring of teacher attendance | No monitoring of teacher attendance | Difference Monitoring – No monitoring of teacher attendance | Statistical significance |
|------------------------------|----------------------------------|-------------------------------------|---|--------------------------|
| Mean Mathematics Achievement | 200 | 190 | 10 | Δ |
| Mean Reading Achievement | 199 | 188 | 11 | Δ |
| Mean Writing Achievement | 199 | 192 | 7 | Δ |



Influences on learning at the student/home level

Context at the student level

Demographic information (gender, age)
Early Childhood Education attendance
Attitude towards schooling
Self-efficacy
Educational aspirations

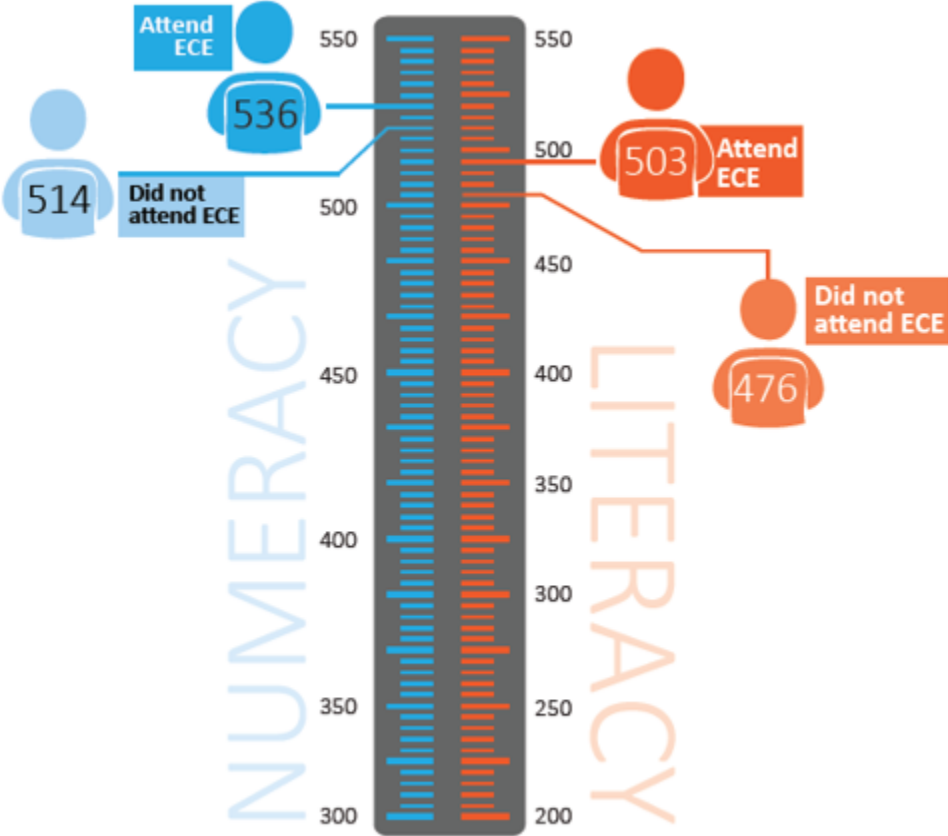
Context at the home level

Parental occupation/education
Household resources
Home learning environment
Family structure
Family cultural background

Example of a student level factor – ECEC attendance - (from PILNA 2018)

Differences in numeracy and literacy achievement for those students who attended an Early Childhood setting prior to school compared to those who did not from PILNA 2018 regional report

(EQAP, 2019, p.60).

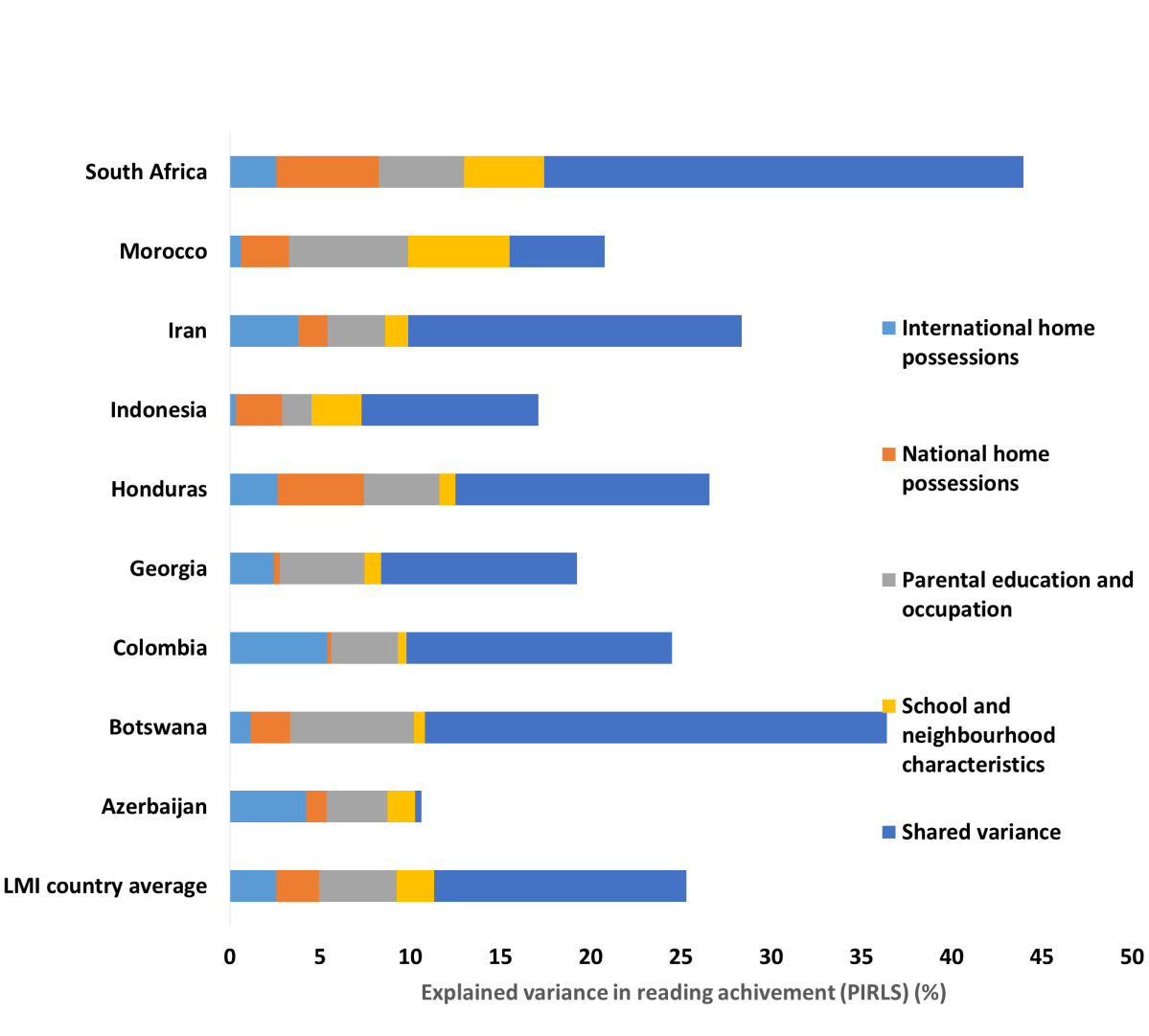


Equity and student achievement

- Goal 4 of The United Nations' Sustainable Development Agenda 2030 which seeks to “Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all”.
- The relationship between socio-economic background of students and achievement is constant across studies
- Measures of socio-economic background are important components in large-scale educational assessments – role in understanding differences in social distribution of learning outcomes
- SES as an ‘input’ construct which relates to ‘outcomes’ (equity focus)
- SES as a ‘control’ variable (to avoid “mis-specified models”)
- In order to be effective and to generate meaningful results, it is important that SES indicators are appropriate for the social and economical environment in which they are applied.

Equity and student achievement

In PIRLS 2011, around one quarter of variance in reading achievement for lower-middle income countries was explained by SES-related factors



Understanding learning at the national level

- Need for secondary research – regional and national reports from surveys have limited scope to present findings
- Opportunities to link findings back to policy
- Country level data for several ILSAs available (OECD PISA, IEA TIMSS, ICCS, ICILS, PASEC) – requires understanding of quantitative research

Explorer tools that do not require technical expertise

- NCES International Data Explorer
<https://nces.ed.gov/surveys/international/ide/>
- ACER developed pre-populated Excel-based data explorer tool used for PILNA and other studies

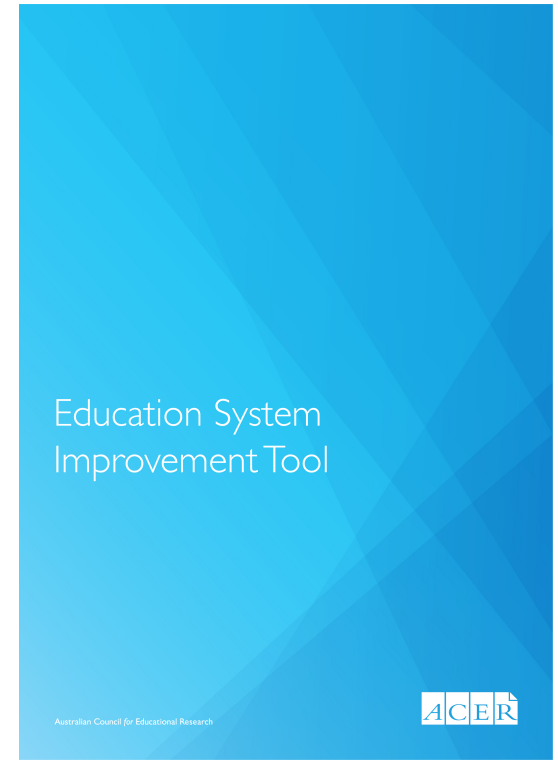
Improving learning

The ultimate goal of school improvement is to improve academic and wellbeing outcomes for all students.

This means:

- a focus on the day-to-day practices in schools
- a shared understanding of what good practice looks like (specific, observable, measurable practices)
- using research-based frameworks to collect evidence of current practice, to pinpoint current levels of performance in different domains of practice

ACER tools



Organisation of the NSIT

9 Areas of Practice

Descriptor

Characteristics
(specific practices)



Performance levels

Outstanding

High

Medium

Low

2

Analysis and discussion of data

A high priority is given to the school-wide analysis and discussion of systematically collected data on student outcomes, including academic, attendance and behavioural outcomes, and student well-being. Data analyses consider overall school groups; evidence of improvement/regression over time; performances in comparison with similar schools; and, in the case of data from standardised tests, measures of growth across the years of school.

The assessment of this domain includes consideration of the extent to which:

- the school has developed and is implementing a plan for the systematic collection of a range of student outcome data including both test data and quality classroom assessments
 - the school has identified and can demonstrate that it is using tests and other assessment tools to monitor school-wide achievement and progress in areas of national focus such as literacy, numeracy, science, cross-curricular skills and attributes, and levels of student resilience, wellbeing, and social and emotional development:
 - the school uses data to identify starting points for improvement and to monitor progress over time;
 - arrangements have been put in place for the collection and analysis of school-wide data and for summarising, displaying and communicating data, including to parents and the school community;
 - all teaching staff have access to a broad range of student achievement and wellbeing data and use it to analyse, assess and display
- individual and cohort progress
 - professional development is provided to build staff skills in analysing and interpreting data;
 - school leaders, as part of their responsibilities, regularly work with their teams to review achievement data relating to their areas
 - time is set aside for in-depth staff discussions of achievement data and of strategies for the continuous improvement of student outcomes;
 - the school includes in its data gathering input and feedback from students and parents;
 - the school systematically monitors other performance data, including data relating to student attendance, school disciplinary absences and other behavioural data, school completion, student aspirations and stakeholder perceptions and engagement;
 - data are used in building a culture of self-evaluation and reflection across the school; and
 - the school uses data to inform school-level decisions, interventions and initiatives.

**shared language, shared focus, shared
commitment and shared understanding**

What works?

- ✓ building shared language, commitment and understanding of improvement
- ✓ knowing what good practice looks like- observable, measurable practices
- ✓ collecting and analysing evidence: what you read, see and hear in a school (from multiple perspectives); achievement and wellbeing data and teacher judgement to ascertain current performance
- ✓ narrow and sharp improvement agenda with targets and goals that are monitored: a small number of ambitious goals, including building capacity in instructional leadership, teaching and monitoring and evaluation, to deliver on them (Fullan, 2009).
- ✓ small number of ambitious goals, including literacy and numeracy proficiency and high school graduation, and built capacity in instructional leadership, teaching and monitoring and evaluation, to deliver on them (Fullan, 2009).
- ✓ activating intrinsic motivation and collective capacity building

Principal supervisors reported engaging with principals around instruction and data more than ever. A higher percentage of supervisors discussed effective practices in teaching and learning; conducted meetings directly related to findings from data; and discussed feedback from classroom walk-throughs with principals (Cochran et al., 2020, pp. 3 & 10).

- i) *demographic data* relating to students, teachers and the school;
- ii) *instructional processes data* relating to aspects of curriculum and pedagogy; and
- iii) *achievement data* including student performance on state, district and teacher-developed tests.

And.. exemplary support:

district leadership that was committed to data use; central offices that provided data analyses and training; opportunities for partnerships providing technical expertise; access to consultant specialist staff; and establishment of well-defined school improvement processes, embedded within quality improvement cycles.

(Armstrong & Anthes, 2001)

Improving learning

1. Understanding the bigger context and school context – identify what's important. Using data to know where you are as a school.
2. From the data, prioritising a small number of desired student improvement outcomes.
3. Setting measurable student outcome targets with timelines.
4. Working out the best (evidence-based) strategies for your school with timelines, milestones, delegations, human resources, budgets.
5. Measuring and monitoring progress, regularly reviewing, reflecting.



Examples:

Queensland

Indigenous contexts

PNG

China
UAE
Indonesia



What doesn't work?

No education system in the world has realised system reform through a dominant accountability agenda (Fullan, 2011).

“Fat” plans

Thank you!

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