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
Quality, accessible, timely and reliable data will be needed to help with measurement and progress to ensure that no one is left behind. Such data is key to decision-making.

(2030 Agenda for Sustainable Development)
Global learning crisis

258 million children, adolescents and youth are out of school

617 million children and adolescents aren’t achieving minimum proficiency levels in reading and maths

1 in 3 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.”

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*
<table>
<thead>
<tr>
<th>4.1.1 terms</th>
<th>Proposed Definition</th>
<th>Proposed Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MATHEMATICS</strong></td>
<td><strong>READING</strong></td>
<td></td>
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<tr>
<td><strong>End of Lower Secondary</strong></td>
<td>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.</td>
<td>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.</td>
</tr>
<tr>
<td><strong>End of Primary</strong></td>
<td>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.</td>
<td>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.</td>
</tr>
<tr>
<td><strong>Grade 2/3</strong></td>
<td>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.</td>
<td>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.</td>
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</table>
DESCRIBED PROFICIENCY SCALES
READING

Understand texts with familiar structures and manage competing information
Make connections to understand key ideas
Understand simple texts outside of a student’s personal experience
Read a range of everyday texts fluently and begin to engage with their meaning
Match one of four given words to an illustration of a familiar object

SDG 4.1.1 READING – END OF PRIMARY
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.
**SDG 4.1.1 READING – END OF PRIMARY**
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**SDG 4.1.1 READING – END OF LOWER PRIMARY**
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.
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
- OECD PISA
- OECD SSES

**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).

<table>
<thead>
<tr>
<th>Level of …</th>
<th>Antecedents</th>
<th>Processes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wider community</td>
<td>For example, structure of education systems</td>
<td>For example, status of numeracy and literacy in the national curriculum</td>
</tr>
<tr>
<td>School/classroom</td>
<td>For example, school characteristics</td>
<td>For example, teaching policy and practice</td>
</tr>
<tr>
<td>Student</td>
<td>For example, sex and age</td>
<td>For example, individual learning activities at school</td>
</tr>
<tr>
<td>Home environment</td>
<td>For example, home resources</td>
<td>For example, learning at home</td>
</tr>
</tbody>
</table>
Mapping the contexts for learning

Interaction between antecedents, processes and outcomes

Example from SEA-PLM Assessment Framework

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).
### 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).

<table>
<thead>
<tr>
<th></th>
<th>Monitoring of teacher attendance</th>
<th>No monitoring of teacher attendance</th>
<th>Difference Monitoring – No monitoring of teacher attendance</th>
<th>Statistical significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Mathematics Achievement</td>
<td>200</td>
<td>190</td>
<td>10</td>
<td>Δ</td>
</tr>
<tr>
<td>Mean Reading Achievement</td>
<td>199</td>
<td>188</td>
<td>11</td>
<td>Δ</td>
</tr>
<tr>
<td>Mean Writing Achievement</td>
<td>199</td>
<td>192</td>
<td>7</td>
<td>Δ</td>
</tr>
</tbody>
</table>
### 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
Organisation of the NSIT

9 Areas of Practice

Descriptor

Characteristics (specific practices)
Performance levels

Outstanding

High

Medium

Low
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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