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RESEARCH ON IMPROVING SYSTEMS OF EDUCATION

Building on solid foundations: What learning profiles tell us about prioritizing for learning

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UKFIET, September 18, 2019

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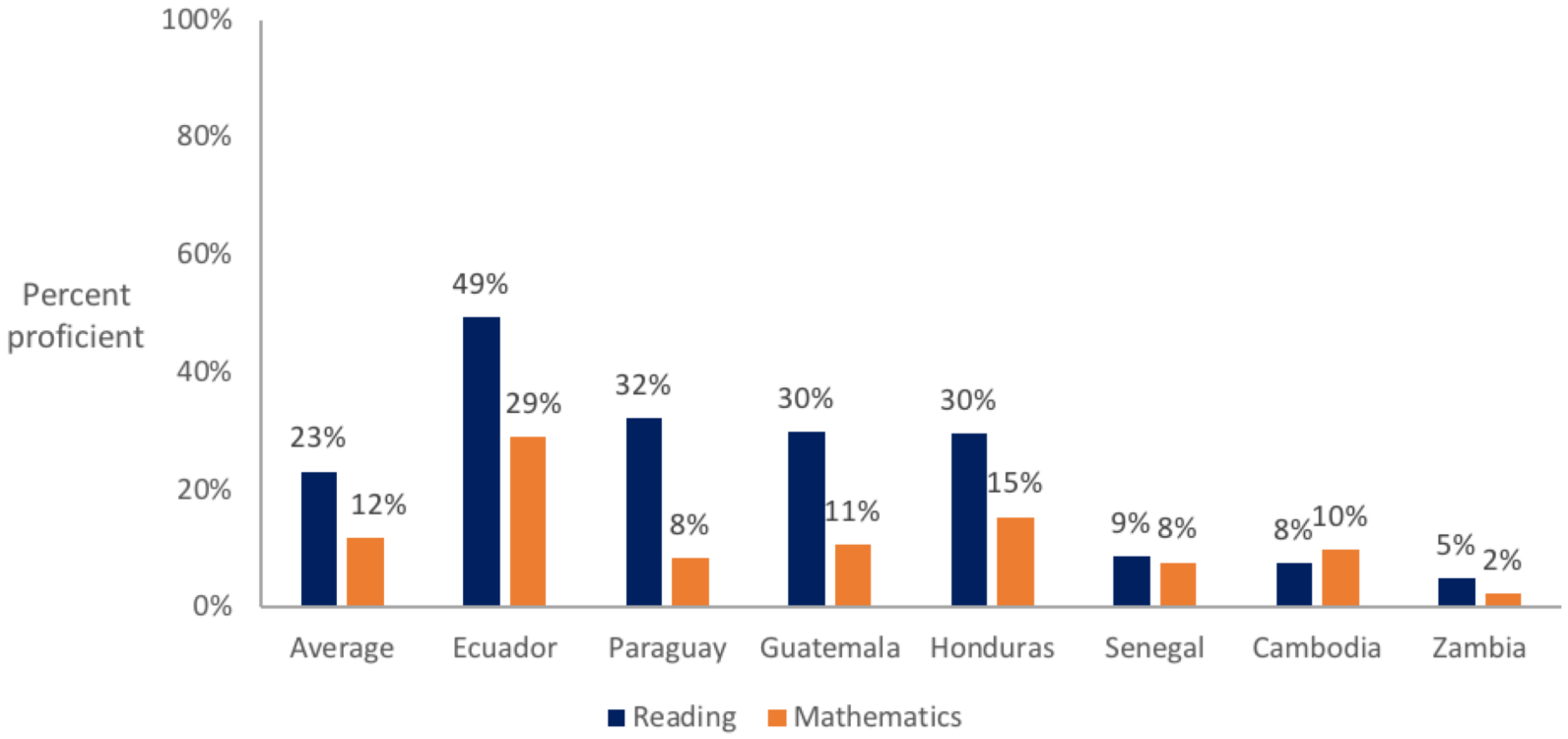
We know learning is in crisis

All PISA-D countries fall far short of universal proficiency in reading and mathematics (even among those who were assessed…)



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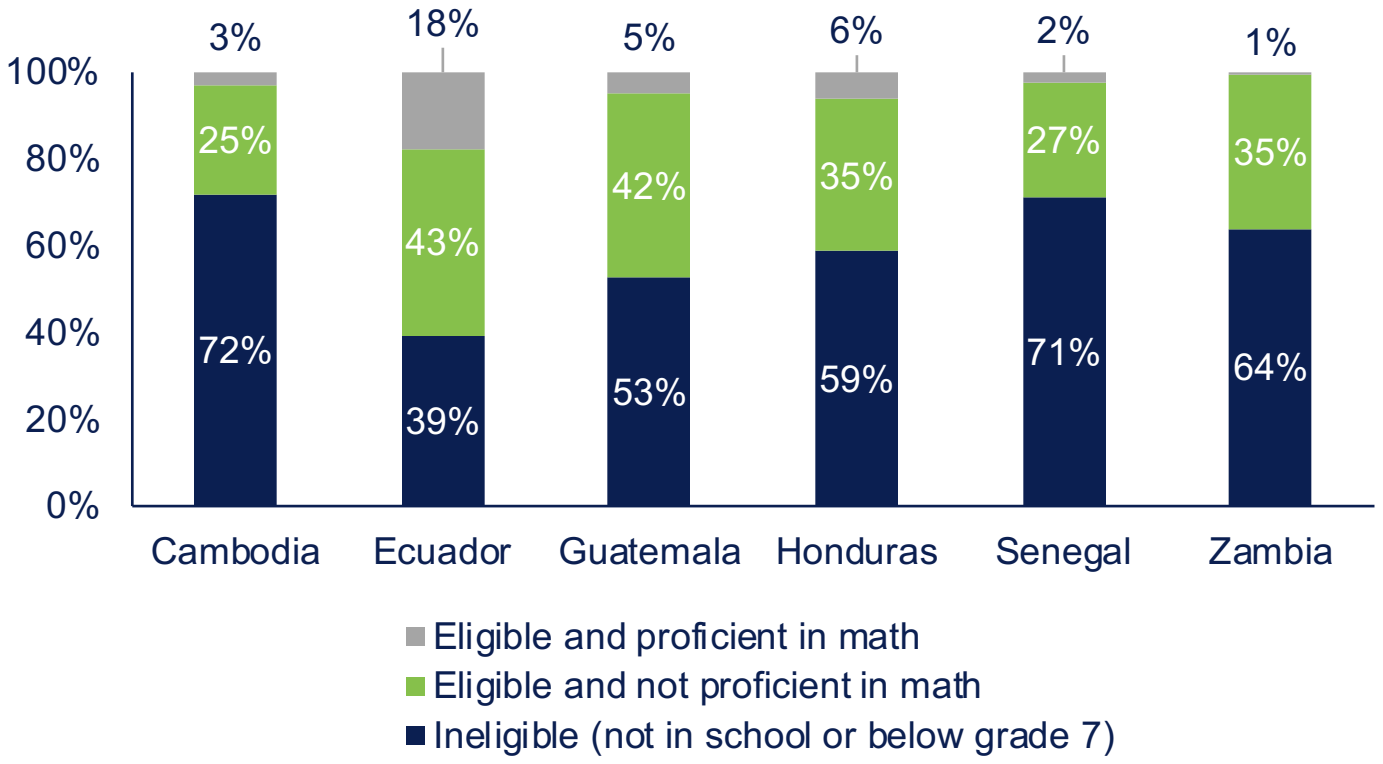
Source: PISA for Development, 2018

Proficiency defined as Level 2 or above (per OECD)

It's actually even worse than that

*Low levels of eligibility mean a much smaller percent of **all** 15-year-olds demonstrated proficiency on PISA-D*



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Source: PISA for Development, 2018

Proficiency defined as Level 2 or above (per OECD)

But, those don't tell the whole story

- Children got to where they are through some process of learning (or not) over multiple years
- Cross sections of a single age/grade don't show the dynamics of the progression of learning by age/grade
- Assessments at later grades (even primary leaving exams) can be too late in the cycle to show when children begin to fall behind
- Data only on children in school give no information on learning among those who dropped out or never started (what about all those children ineligible for PISA-D?)
  - Data on **all** children is needed for understanding progress on **equity** goals

Analyzing learning profiles

- Work on learning profiles to help fill these gaps

- Learning profiles are the empirical association between years of schooling and learning achieved

- Allow us to trace out the trajectory of learning across multiple ages/grades
- Typically cover the earlier schooling years and a full cohort of children – both in and out of school
- Use data such as ASER, Uwezo, DHS, FII surveys
- Understand when children begin falling behind
- Analyze learning differences across groups

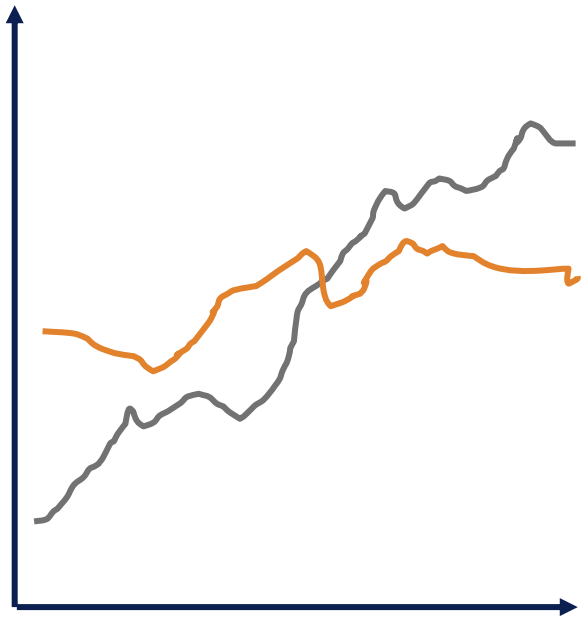
Analyzing learning profiles

- Cohort learning is exact decomposition of grade attainment and learning per grade. For example, a cohort learning profile for literacy is represented by:

$$Percent\ literate\ of\ a\ cohort = \sum_{g=0}^{N} \alpha_g * s_g$$

Where α_g is the share of cohort with level g as their highest level attained (and no schooling is 0) and s_g is the share of a cohort with highest schooling attainment of g who can read.

Any measure of skill/capability (reading, piano, kindness, football)



Measure of duration of exposure to learning (schooling, lessons, age)

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Analyzing learning profiles

- Altogether, RISE has analyzed learning profiles for more than 50 countries, covering more than 6 million individuals

- Sneak preview of two main sets of findings:
  - Learning profiles are highly varied across countries; on average are low (including in early grades); and in some places are getting worse
  - Learning profiles show achieving equality goals within countries will often not achieve equity goals of universal learning as in many countries even advantaged groups have low learning

- Suggest need to prioritize Universal, Early, Conceptual and Procedural Mastery of Basic Skills

Learning profiles vary widely and often are flat

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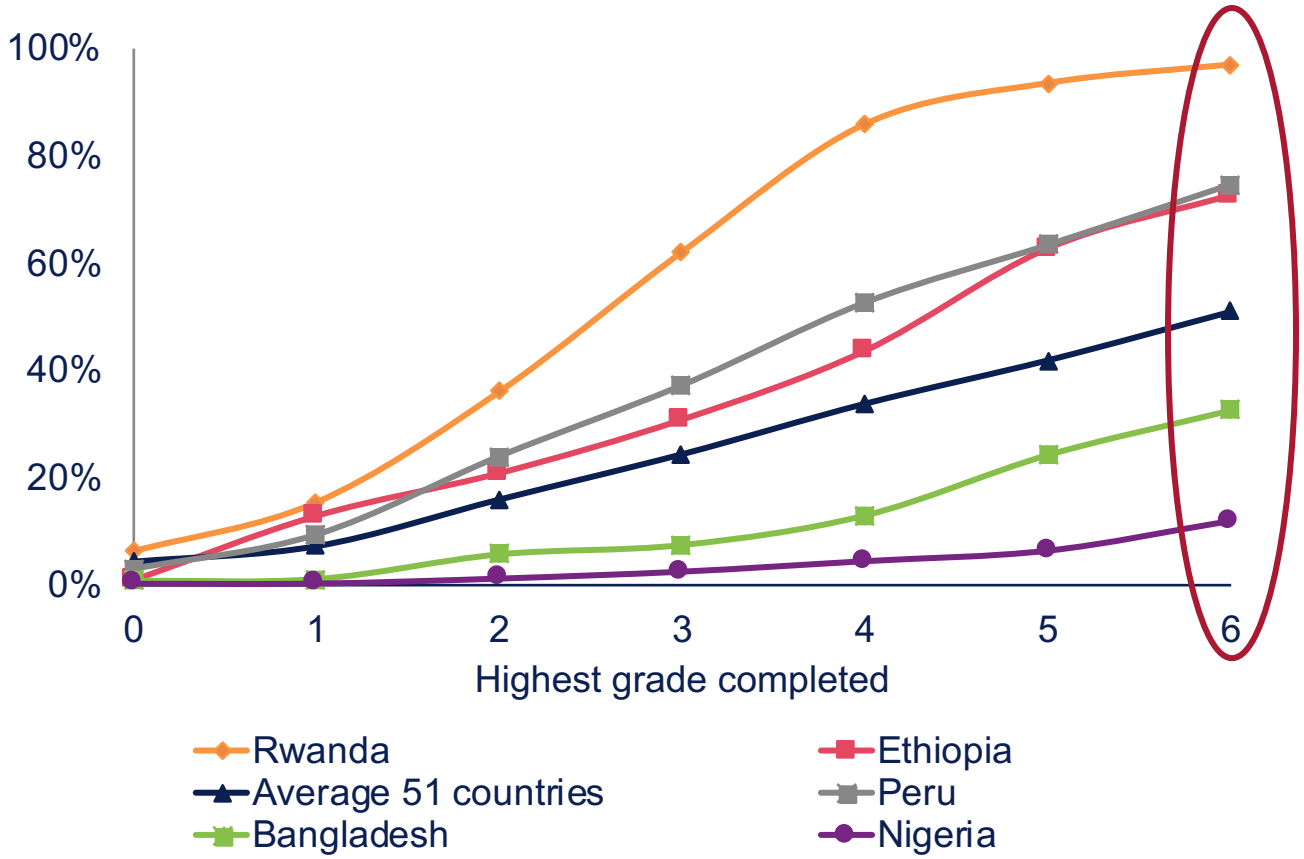
Percent of young adult women (25-34 years) who can read a single sentence by grade completed



Learning profiles using DHS data show that learning varies massively, and across 51 countries on average only half of young adult women who completed six grades (and no more) can read a simple sentence in a language of their choosing.

Source: Pritchett and Sandefur 2017 using DHS data.

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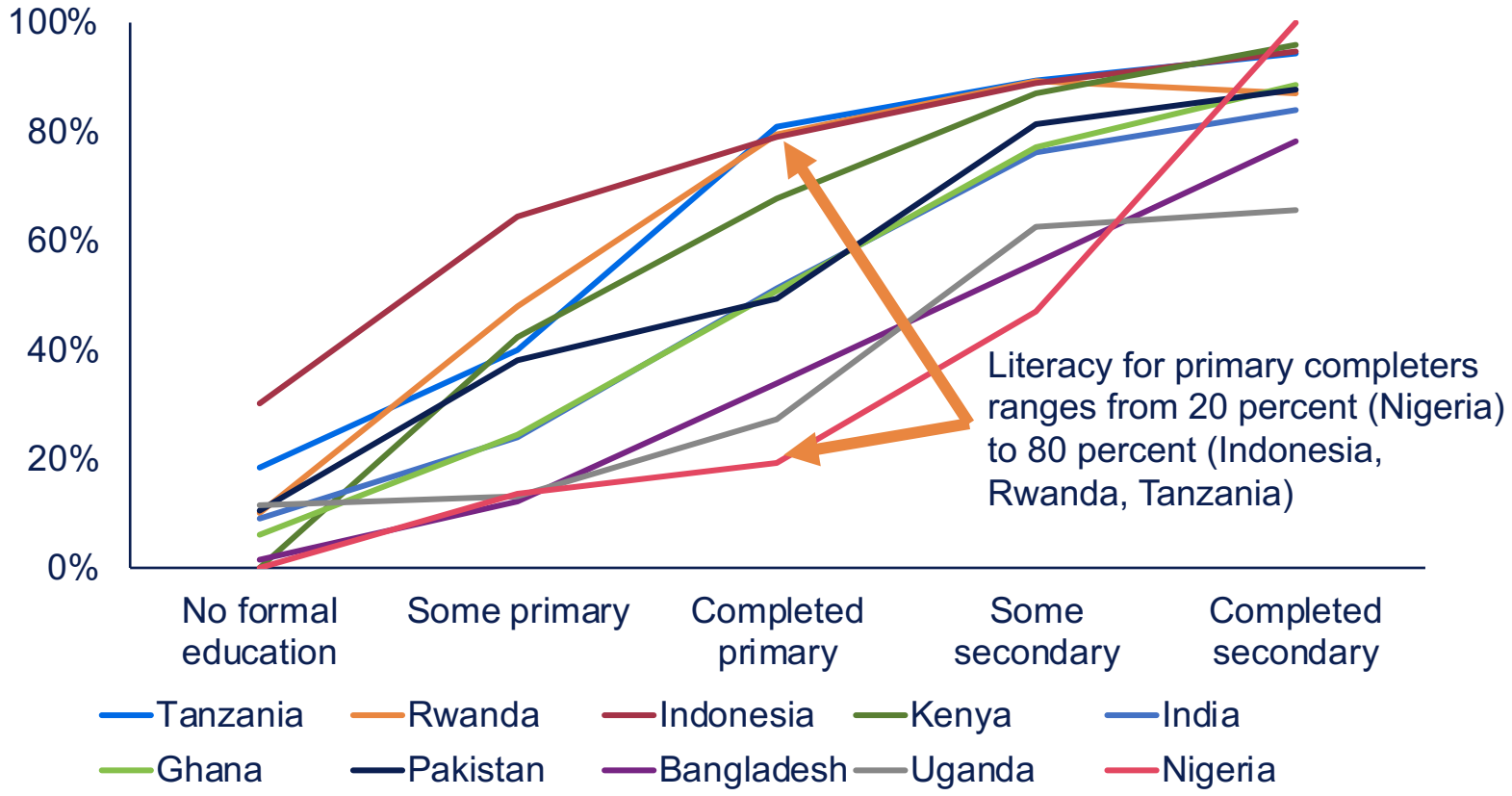
Findings are consistent: Similar findings from different data using different literacy assessment

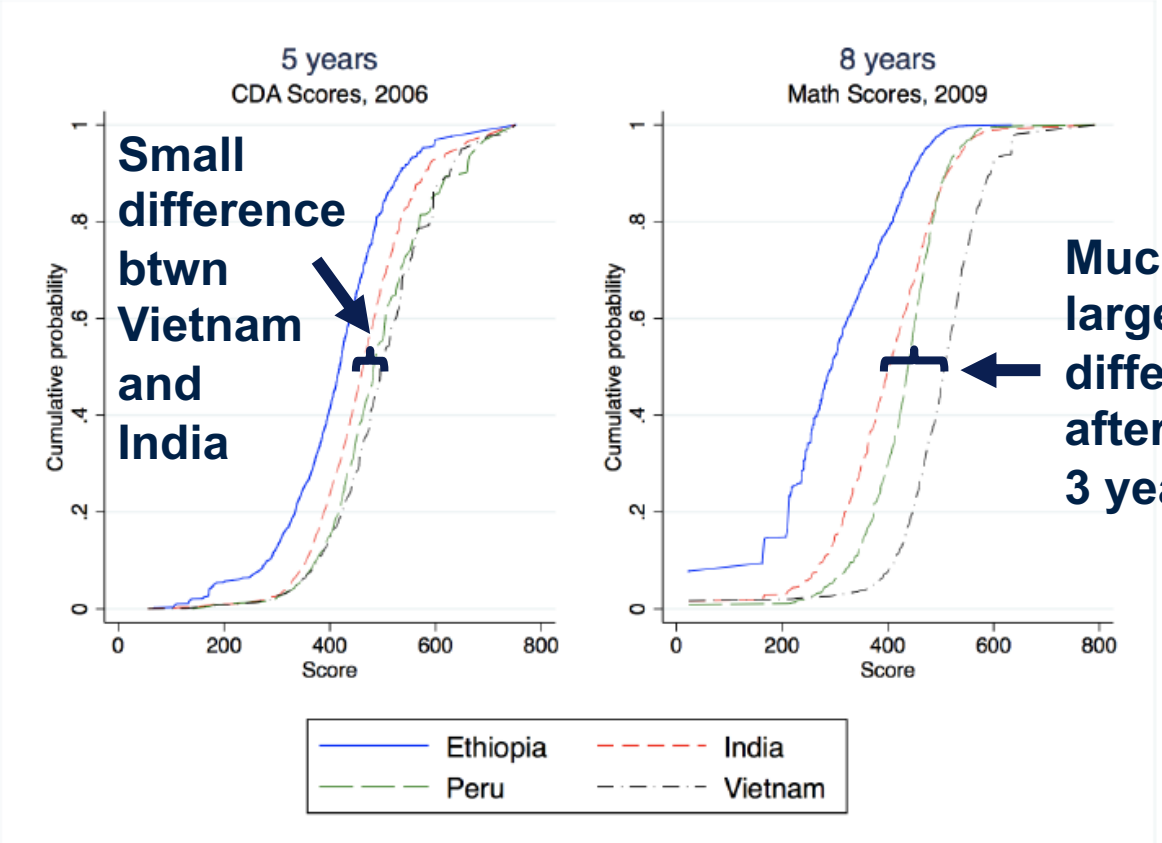
Literacy among adults with primary completion as their highest attainment varies from 20% to 80%, and in 6 out of 10 countries half or fewer are literate



Source: Kaffenberger and Pritchett using FII data.

Across countries: Differences in learning per year emerge early

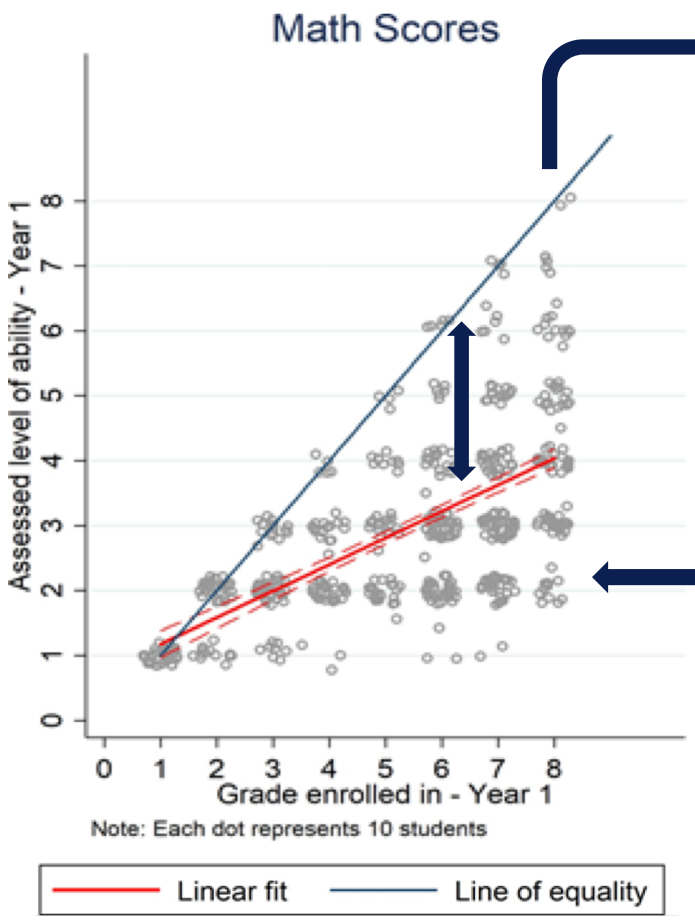
Figure 1: Distribution of achievement at 5 and 8 years



- Across four countries with Young Lives panel learning data, small differences at age 5, but large differences just 3 years later at age 8
- India-Vietnam gap in median scores is only about 50 points at age 5, grows to about 150 by age 8
- Urgency to achieve universal *early* learning so children don't fall behind

Source: Singh 2019.

Similar findings within countries: Low average learning, children fall behind early, large variation by grade 8



By grade 8, massive variation in the skill set in a single classroom (and children on average 4 years behind curriculum)

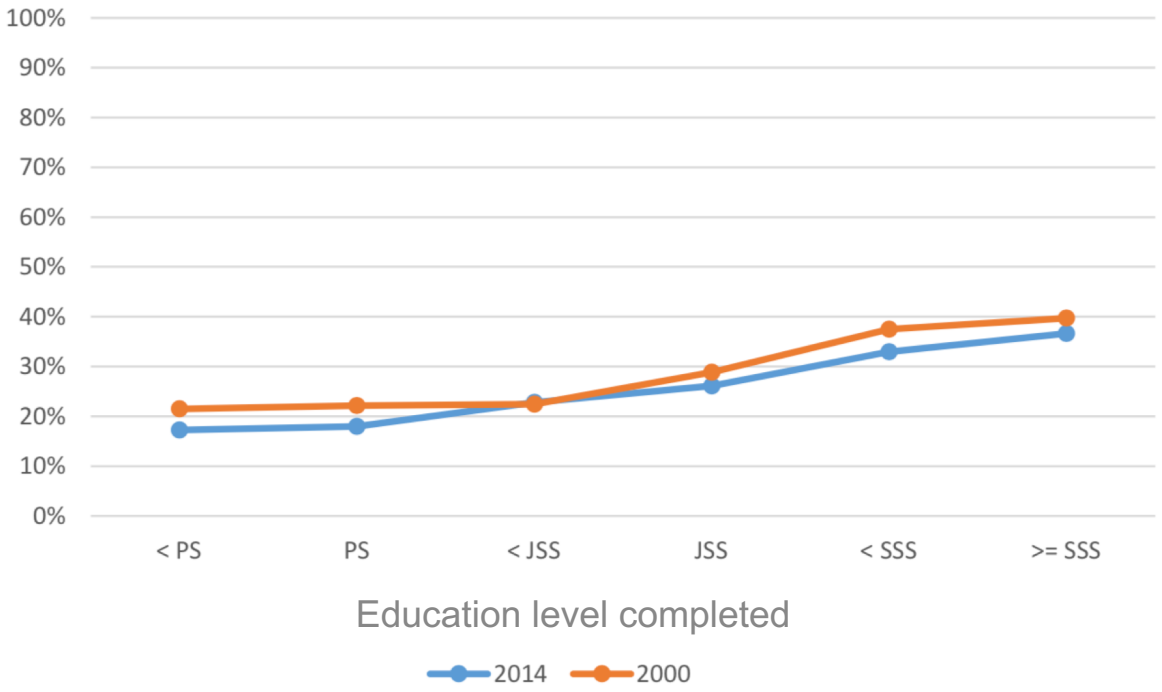
Children who don't gain skills early still haven't gained skills by grade 8, many still at grade 2 and 3 levels

Each dot represents 10 children in the observed grade level and of the observed skill level per the curriculum. India.

Source: Muralidharan and Singh (2019)

Learning profiles in many places aren't improving, and sometimes are even getting worse

Probability of correct answer on basic math questions by level of school completed, using IFLS data from Indonesia.

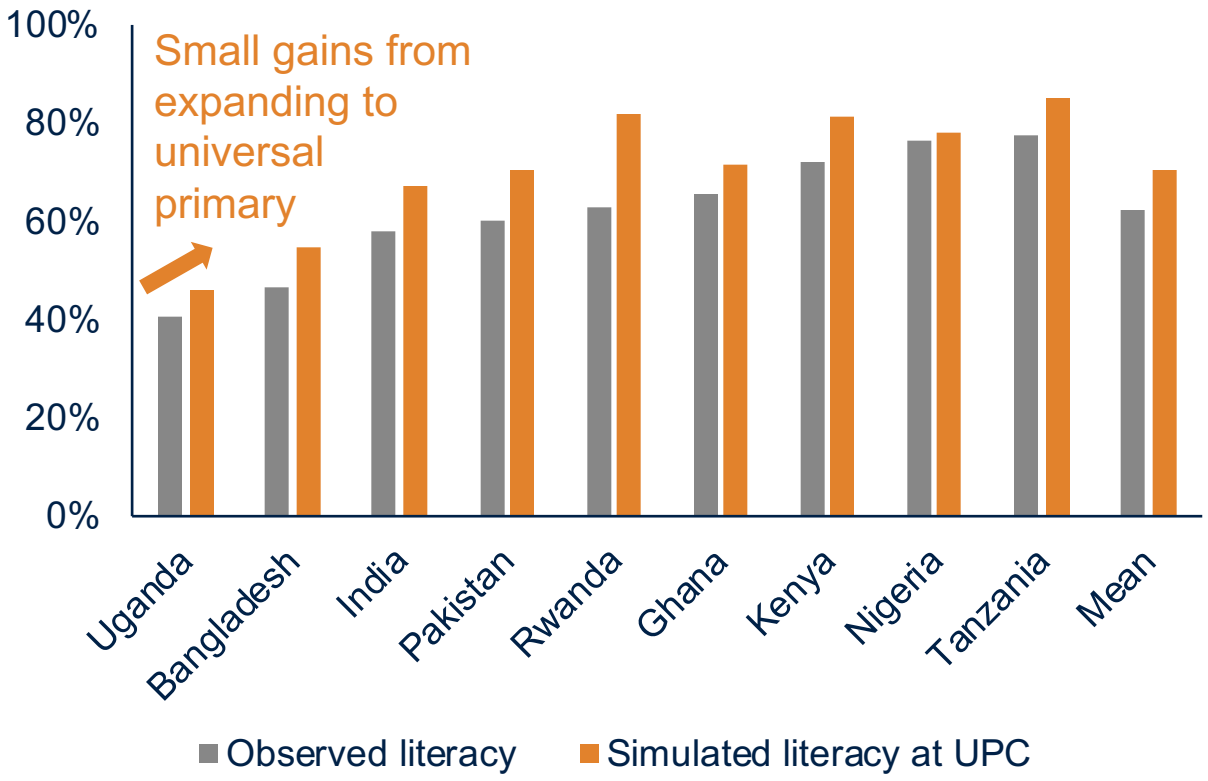


- During a period of large increases in education spending and reforms
- Learning actually declined (slightly)
- Business-as-usual improvements not going to achieve learning goals

Source: Beatty et al. (2018) using IFLS.

Flat learning profiles mean “more years” won’t achieve learning goals such as universal basic skills

Observed literacy at current schooling levels, and simulated literacy under universal primary completion



- Expanding to universal primary completion across 9 countries with FII data would increase literacy only 8.5 percentage points on average, leaving nearly 30% illiterate.
- Flat learning profiles, especially in the early grades, mean children won’t achieve basic skills even from additional schooling (at current learning trajectories)

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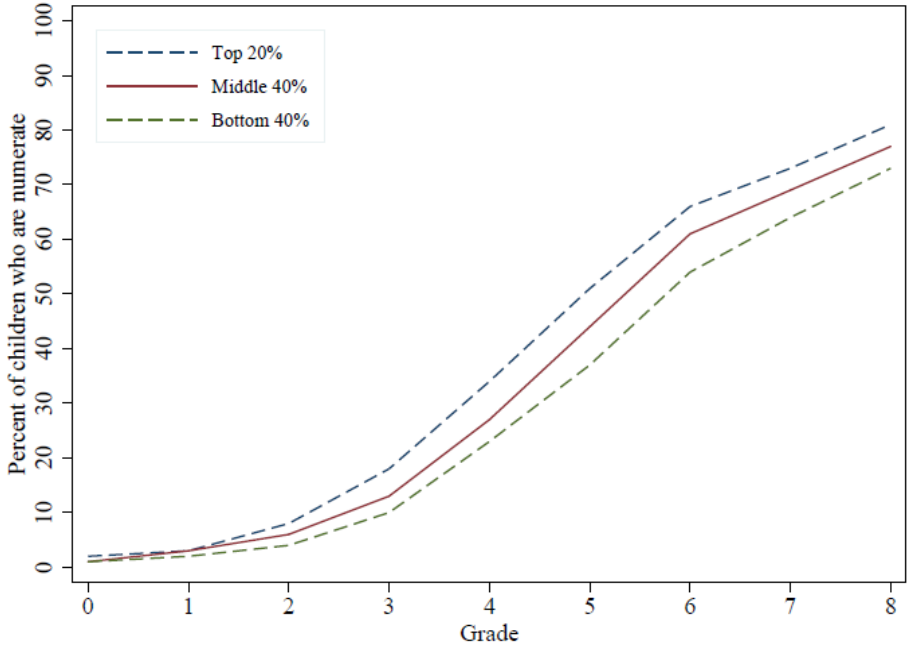
Source: Kaffenberger and Pritchett using FII data.

Learning profiles show achieving equality goals often won't achieve equity goals of learning for all

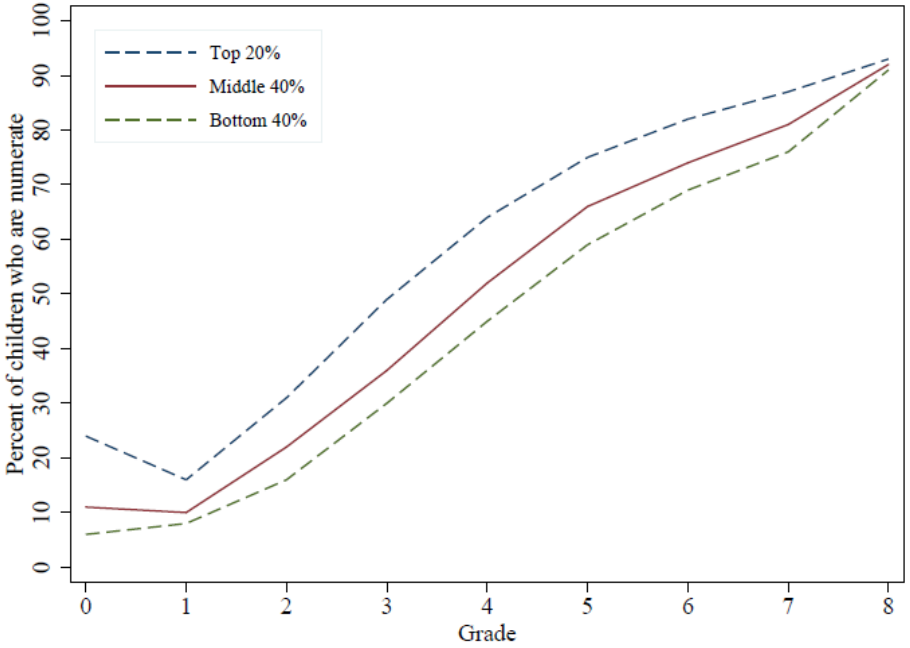
Disaggregated learning profiles

Percent numerate by grade level

Pakistan

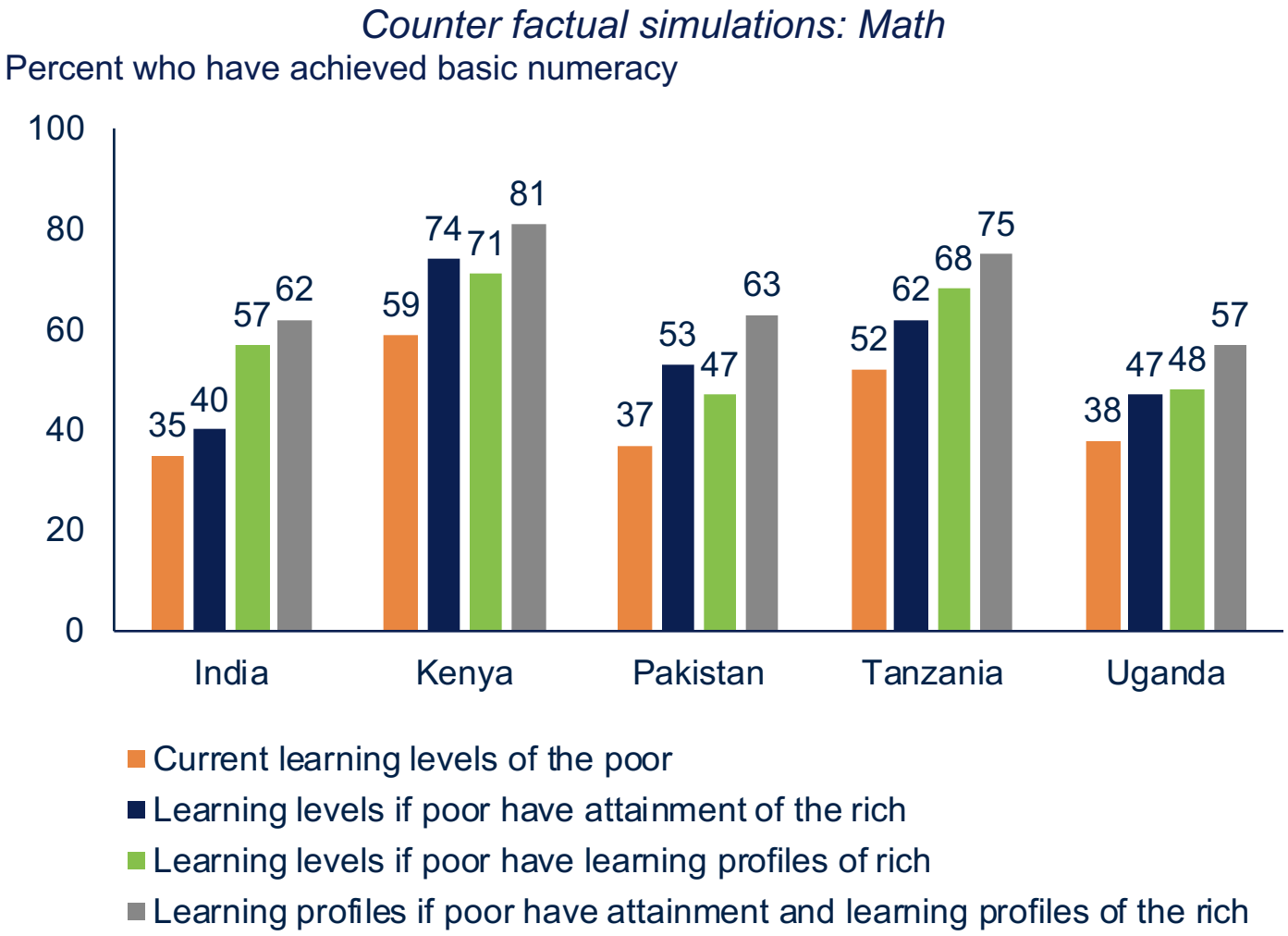


Tanzania



Source: Akmal and Pritchett

Disaggregated learning profiles: “Equality” across wealth groups will still leave many children without basic skills

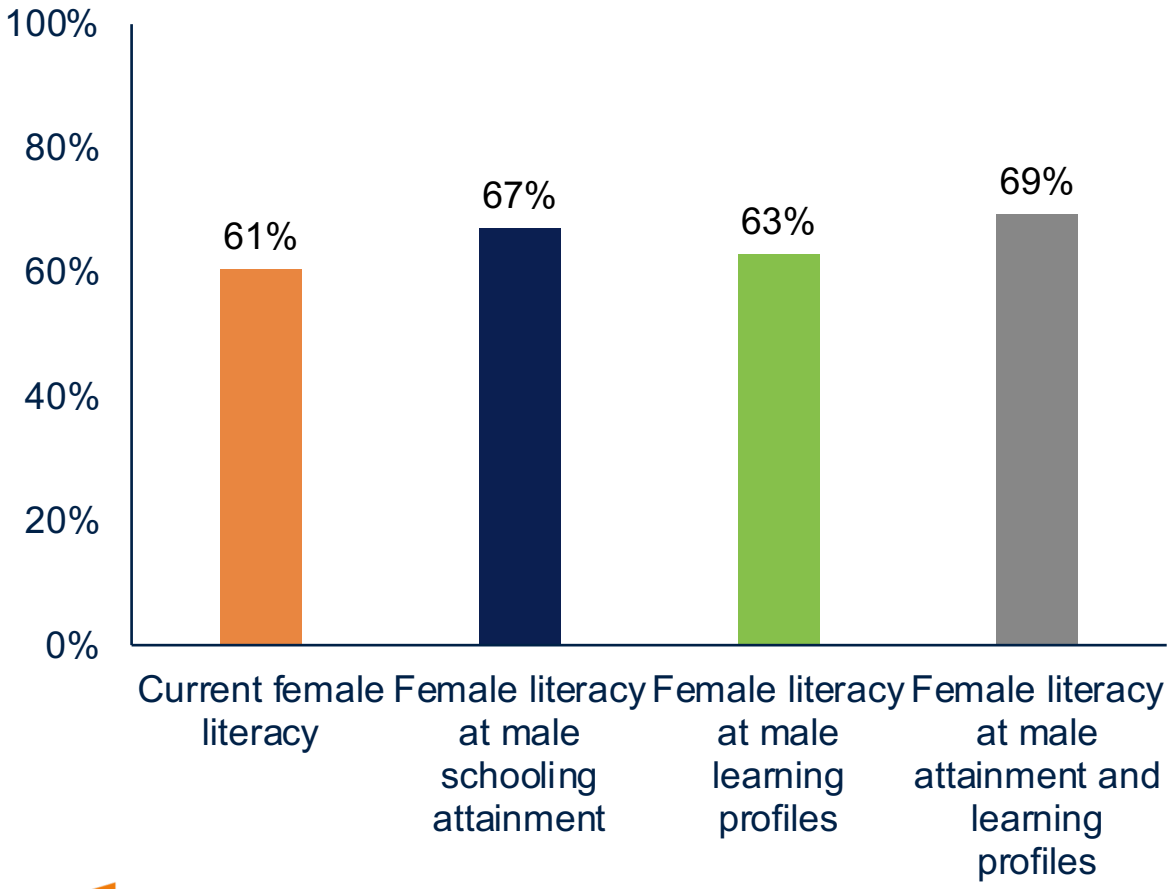


Basic numeracy among the poor (orange bars) increases under equality (grey bars), but is still far short of universal mastery (of basics!)

Source: ASER and Uwezo survey data; numeracy defined as solving division problem

Disaggregated learning profiles: “Equality” across genders will often leave many children without basic skills

Across 10 countries, simulated literacy among young women from achieving gender equality for schooling, literacy, or both



- Simulations show gender equality increases literacy only 8ppts for girls, leaves 30% illiterate

Data includes Uganda, Bangladesh, India, Pakistan, Rwanda, Ghana, Kenya, Nigeria, Tanzania, and Indonesia

Source: Kaffenberger and Pritchett using FII data.

What does this suggest for improving learning?

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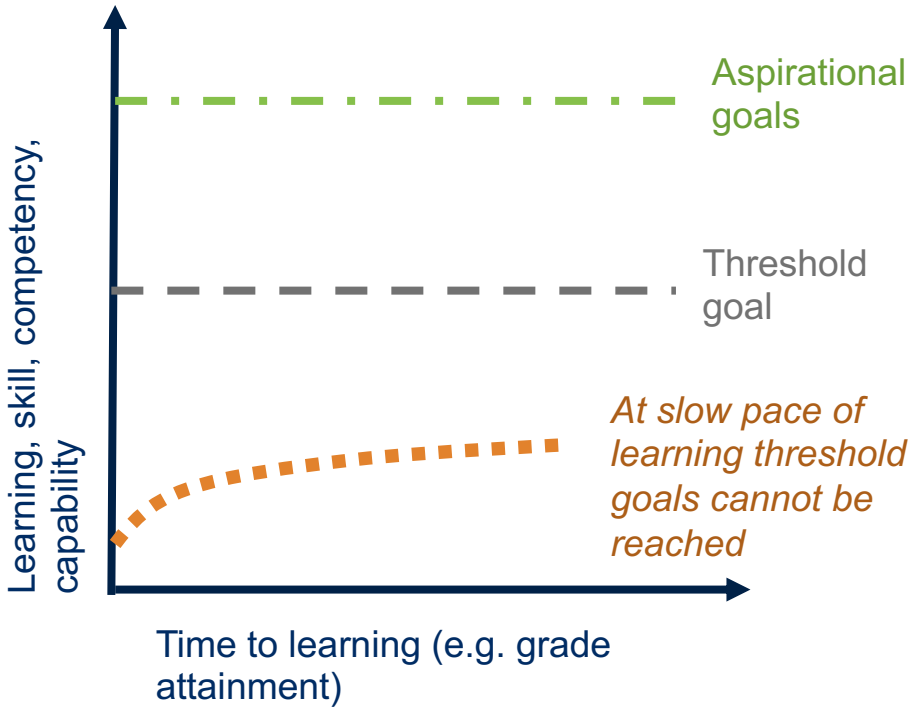
- Suggests that, to improve learning, education systems will need to prioritize:
  - Universal
  - Early
  - Conceptual and Procedural
  - Mastery
  - of Basic Skills
- Which sound *obvious* but often are not *top* priorities

Universal

- Foundational for this panel: Because **all** children must be able to learn
- International learning goals all aim for universal skills
- In many countries, even more advantaged groups have low learning on average – education systems aren't working for **most** children

Early

- Learning profiles show children who fall behind in the early years rarely catch up
- Early skills are building blocks for later skills
- If children spend too many years on a flat learning trajectory, lengthening it or steepening it late often won't be sufficient to achieve learning goals



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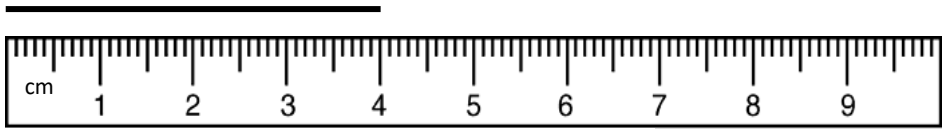
Conceptual and Procedural Mastery

- Because children need to gain **conceptual understanding** that can be used in later learning and application, not just engage in rote learning
- At the same time, they must also gain **fluency in the procedures** of solving arithmetic problems and reading texts
- Conceptual and procedural skills are complementary and build on each other
- They must be **mastered** to a standard of proficiency (leaving open for now what that standard should be) enabling future learning and application

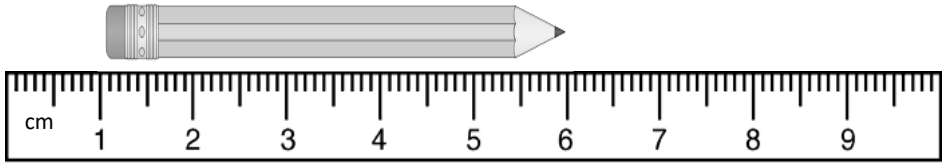
Even in 8th grade more students give the wrong rote answer than the correct answer—on a "level 0" skill

ASER Math Assessment



The length of the line in the figure above is 4 cm.

How long is the pencil shown in the picture? (Use the ruler shown in the picture.)



	Answer given	
	5 cm (right answer)	6 cm (just reads end of pencil)
Class 4	23%	46%
Class 6	22%	42%
Class 8	35%	39%

Rote learning (look at end of object) not conceptual mastery (understanding of measurement)

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Basic Skills

- Because literacy and numeracy are foundational for later skills
- Literacy and numeracy are internationally recognized as priorities (e.g. SDGs)
- If children miss these they continue to struggle (or miss out entirely) on later learning (flattening learning profiles)

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Thank you

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