

3.5 LEARNING EVIDENCE IN READING AND ARITHMETIC IN CHILDREN AGED 5 TO 16 YEARS IN INDIA³⁹

3.5.1 Overview

Thanks to sustained policy focus for well over a decade, today almost all children of elementary school age in India are enrolled in school. In 2005, the first Annual Status of Education Report (ASER)⁴⁰ reported that 6.6% of all children in the official elementary school-age group of 6- to 14-year-olds in rural India were not enrolled in school, a figure that almost exactly matched the official estimate of 6.9% produced by a study commissioned by the Government of India (IMRB, 2014). ASER 2016 reported 11 years later that the proportion of unenrolled 6- to 14-year-olds had dropped by one-half, to 3.3%. With close to 97% children enrolled, the country currently has about 200 million children in elementary school (Classes 1 through 8), or about 25 million children per elementary grade, distributed over more than 1.4 million schools across the country (National University for Educational Planning and Administration, 2017).

Are children's learning outcomes also at satisfactory levels? The body of evidence on children's learning has grown in recent years. Today data are available from a range of sources, including large-scale learning assessments conducted by both government and non-government institutions, as well as research studies that have examined children's learning and its determinants.

However, the only current source of annual, comparable data available on scale in India is the annual ASER survey, first implemented in 2005. Over the years, ASER has provided annual estimates of

basic reading and arithmetic for a sample of children aged 5 to 16 from an average of about 570 rural districts in India.⁴¹ ASER is designed as a household-based, rather than a school-based, survey in order to ensure that all children are included rather than only those enrolled and present in school on the day of the survey.⁴²

ASER employs a "floor" level test of basic reading and arithmetic: that is, the same test is administered to all children aged 5 to 16 regardless of age, grade or enrolment status. The assessment is administered orally, one-on-one (individual administration) with each sampled child.

The reading assessment tool consists of four simple reading tasks illustrated in **Figure 3.22**. The easiest task comprises reading letters of the alphabet, followed by simple commonly-used words. The third reading task comprises a paragraph with four short sentences, equivalent to text that children are expected to be able to transact in Class 1 of primary school. The most difficult task involves reading a slightly longer, more complex text equivalent to the contents of a Class 2 textbook. Tools are currently available in 20 Indian languages, including English, which covers the language of instruction in early grades of virtually all schools in the country. The arithmetic test has a similar design and contains four tasks: single-digit number recognition, double-digit number recognition, two-digit by two-digit subtraction with borrowing, and three-digit by one-digit division.

In both reading and arithmetic, younger children in Classes 1 and 2 are not expected to be able to go beyond the first couple of tasks. However, it is expected that from Class 3 onwards, children should

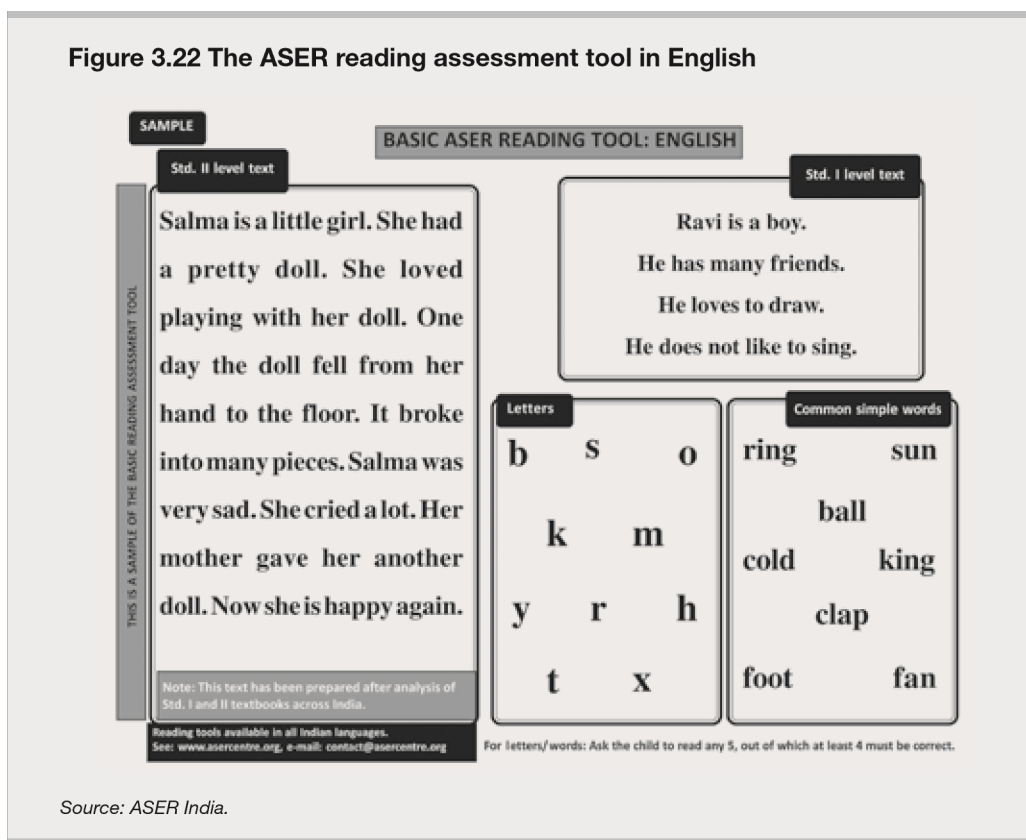
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40 ASER is an annual household-based assessment that generates estimates of schooling status for children age 3-16 and of foundational reading and arithmetic ability for children age 5-16. The learning assessment is administered one on one with each child. Estimates are representative at the district, state, and national level. Facilitated by the non-government organization Pratham and conducted by partner organizations in almost all of India's rural districts, the survey has reached more than half a million children each year since 2005.

41 ASER is designed to generate representative estimates at district, state and national levels. The survey employs a two-stage sample design, with villages being sampled in the first stage and households in the second stage. All children in the 3 to 16 age group in sampled households are surveyed, but only those aged 5 to 16 are tested.

42 Although only a small proportion of children in India is not enrolled in school, absenteeism is a major problem, with an average of about 30% students in Classes 1 to 5 being absent on a random day in the year. In some states this proportion is as high as 50%. Further, a growing proportion of children attend private schools which may be unrecognised and/or unaided, and may thus be missing from the official lists of schools. Generating a representative picture of all children therefore requires household-based sampling.

Figure 3.22 The ASER reading assessment tool in English



be able to comfortably and confidently complete the simple tasks in the ASER assessment.⁴³

3.5.2 Three broad trends

Broadly, three clear trends are illustrated in the ASER data from 2006 to 2016. First, children’s foundational learning levels are low and remain low over time. This is the most frequently cited finding from ASER.

In 2006, ASER reported that 53% of all children enrolled in Class 5 across the country could read a simple text at a level of difficulty three grades below. In other words, even after four years of schooling, only slightly over one-half of all children were able to comfortably read a text at Class 2 level of difficulty,

such as the text labelled “Std II level text” in Figure 3.22. This proportion did not increase over the following decade and in fact was observed to decline further after 2010. By 2016, just 48% of students in Class 5 were able to read a Class 2 level text (see **Table 3.6**).

Table 3.6 Percentage of children from Classes 3, 5 and 8 who can read a Class 2 level text

Year	Class 3 (%)	Class 5 (%)	Class 8 (%)
2006	20.0	53.1	83.8
2008	22.2	56.2	84.8
2010	19.5	53.7	83.5
2012	21.4	46.8	76.4
2014	23.6	48.0	74.6
2016	25.1	47.8	73.0

Source: ASER India.

43 The basic reading and arithmetic tasks outlined here are designed based on an analysis of the state textbooks provided free of charge to students. A national-level document detailing specific learning objectives for each grade and subject has been prepared and released quite recently, towards the end of 2017. While the reading and arithmetic tasks are administered every year, ASER also tests some additional competencies. In previous years these have included basic English, applied arithmetic and reading comprehension, among others.

Also evident was the fact that, once children had fallen behind, the opportunities to acquire the abilities expected in the early years of primary school were scarce. Even in Class 8, close to one-fifth of all children were still unable to read at Class 2 level. As in the case of Class 5, this fraction decreased further after 2010. In 2016, the latest year for which ASER data are available, more than one-quarter of all students enrolled in Class 8 were unable to read a Class 2 level text. In other words, about one in four children is completing the eight years of free and compulsory schooling mandated by the Government of India without acquiring even foundational reading skills. It is apparent that the school system has been unable to cater to the learning needs of a student population that has expanded enormously in terms of both size and diversity in the space of just a few years.

Turning to basic arithmetic abilities, the picture is similar, as illustrated in **Table 3.7**. In the years leading up to 2010, about seven in ten students in Class 5 could solve a two-digit numerical subtraction problem with borrowing, typically taught in Class 2 in Indian schools (an example can be seen in **Figure 3.23**). By 2016, only one-half of Class 5 students could solve a problem of this kind. As in the case of reading, even in Class 8 significant proportions of children had not mastered these basic arithmetic skills, and this proportion further declined after 2010.

Table 3.7 Percentage of children from Classes 3, 5 and 8 who can do a Class 2 level subtraction (two-digit subtraction with borrowing)

Year	Class 3 (%)	Class 5 (%)	Class 8 (%)
2008	38.8	69.8	88.5
2010	36.3	70.9	88.8
2012	26.3	53.5	73.7
2014	25.3	50.5	67.3
2016	27.6	50.5	66.5

Source: ASER India.

Figure 3.23 Subtraction problems from the ASER tool, typically taught in Class 2 in Indian schools

$$\begin{array}{r} 46 \\ -29 \\ \hline \end{array} \qquad \begin{array}{r} 63 \\ -39 \\ \hline \end{array}$$

$$\begin{array}{r} 47 \\ -28 \\ \hline \end{array} \qquad \begin{array}{r} 45 \\ -17 \\ \hline \end{array}$$

Source: ASER India.

Although not directly comparable with the ASER estimates, learning achievement data produced by the Government of India also point to declining learning outcomes among India's elementary school students. Aggregate national results from the latest round of the National Achievement Survey (NAS)⁴⁴, 23 of which were conducted in November 2017, are still awaited. However, the previous cycle of NAS for Class 5, conducted in 2014, concluded that the average achievement of Class 5 students on reading comprehension tasks declined from 2010 to 2014, as did the achievement of both the top 25% and the bottom 25% of students. In mathematics, a decline in average achievement from 2010 to 2014 was observed in every content area assessed (NCERT, 2015).

Poor and declining learning levels are also reported in other research studies. For example, the Young Lives study in the Indian state of Andhra Pradesh tracks cohorts of children over time. It concluded that a "comparison of scores in mathematics tests shows that learning levels have declined by 14 percentage points for 12-year-olds in 2013 compared with children of the same age in 2006" (Young Lives, 2014).

⁴⁴ Designed by India's National Council for Educational Research and Training, NAS is a pen-and-paper assessment administered periodically to a sample of students in Classes 3, 5, 8 and 10 in government and government-aided schools that assesses student performance relative to grade level expectations. Different cycles of NAS have employed different methodologies for sampling and data analysis as well as different assessment instruments, making comparisons over time infeasible.

A second broad trend observable in ASER data is that, although children do acquire foundational skills as they continue in school and proceed to higher grades, the learning trajectories of successive cohorts are quite similar and low, as shown in **Figure 3.24**.⁴⁵ If a goal of the school system is to ensure that most children reach the learning outcomes expected of them at their grade level, then the learning curve for basic reading – a fundamental building block for all future progress in school – needs to be much steeper during their primary school years.

The third broad trend observable in ASER data is that each successive cohort seems to do worse than the previous one. For example, **Table 3.8** presents learning outcomes in arithmetic of three cohorts over time. Of the first cohort – those who were in Class 5 in 2007 – 42% could do division in Class 5 in 2007, as compared to 38% of the cohort that was in Class 5 in 2009. Of the children who entered Class 5 in 2011, only 28% could solve a similar division problem.⁴⁶

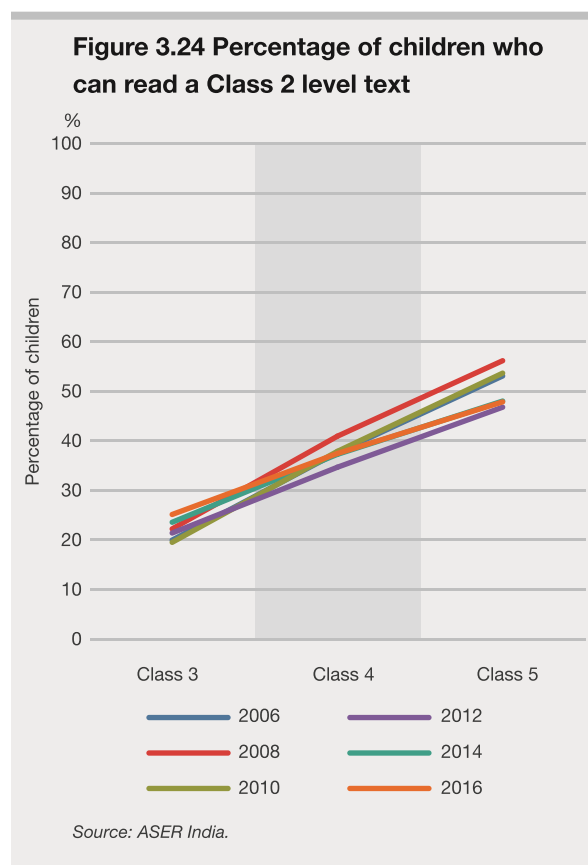


Table 3.8 Percentage of children who can do division

	Cohort 1 in Class 5 (2007)	Cohort 2 in Class 5 (2009)	Cohort 3 in Class 5 (2011)
Class 5	42.4	38.0	27.6
Class 6	50.0	50.1	33.1
Class 7	59.7	48.3	38.8
Class 8	68.3	48.0	44.1

Source: ASER India.

Each column in Table 3.8 can be seen as the learning trajectory for a specific cohort of students. It is clear from the data that in each class learning levels of each successive cohort are worse as compared to the previous cohort. For instance, by the time the 2007 Class 5 cohort reached Class 8 in 2010, 68% could do division. In contrast, only 48% of the cohort that started Class 5 in 2009 could do division by the time they reached Class 8 in 2012; and just 44% of the cohort that started Class 5 in 2011 could do division when they reached Class 8 in 2014. In other words, the learning trajectories of successive cohorts lie below those of previous cohorts (see **Figure 3.25**). What this means is that each additional year of schooling is adding less for each successive cohort.

3.5.3 Conclusions

Several key challenges surface repeatedly from the evidence discussed. First, a substantial proportion

⁴⁵ Ideally, to measure change in learning outcomes, the same children would be tracked over time. While ASER does not track children longitudinally, it can be used to create artificial cohorts to see how successive cohorts are faring as they move through different grades.

⁴⁶ This analysis is for all children currently enrolled in school, whether government or private school. A similar analysis for only government schools shows that learning levels are lower as compared to private schools. However, it is well known that the demographic and background characteristics of private school children can be quite different from those of government school children – these need to be controlled for when comparing learning outcomes. But even children in private schools are far from reaching grade level expectations.

**Figure 3.25 Cohorts over time:
Percentage of children from Class 5
to Class 8 who can do division**



of students in India complete the eight years of compulsory schooling without acquiring basic literacy or numeracy skills. Second, when students do not acquire the capabilities expected of them in early primary grades, it is difficult to catch up in later years. As school enrolment expands to previously-unreached populations, many children in elementary school are first-generation school-goers, meaning that supplemental help at home is often not available. At the same time, much of the teaching in Indian classrooms focuses on transmitting the content of textbooks for that grade and targets children who are at grade level, with the result that those who have fallen behind do not get the opportunities or the support that would enable them to catch up. Being in this kind of “low learning trap” means that, although there is expenditure on schooling both by families and by the government for each year spent in school, the “value added” in terms of learning is minimal.

By including both enrolment and learning goals as part of SDG 4, the world now has a framework that acknowledges the fact that getting children to school is not enough. This is clearly reflected in Indicator 4.1.1. As shown in Table 3.6., ASER data from 2016 show that in Class 3 just one in four children can read a Class 2 level text; and even in Class 8 – the end of the elementary cycle in India – more than one-quarter of students are still unable to do so. This means that each year an estimated 6 million children complete elementary school in India but without having acquired even the basic skills required for future progress, whether academic or professional. The gap between rising expectations and falling ability levels poses a serious obstacle to India’s ability to realise the promise of a “demographic dividend” due to its young population.

Today, ASER estimates are routinely quoted by those thinking about the quality of education in India. But these issues are not unique to India. The ability of the ASER assessment model to diagnose the core issues at the heart of the learning crisis using metrics and measures that are simple, quick, scalable, easy to understand and above all actionable has generated a ripple effect that has spread from country to country, leading to a unique South-South collaboration that is known today as the PAL Network.

Currently comprising 14 countries across three continents, each network member implements a citizen-led assessment (CLA) that follows a set of principles that is common across the network, adapting the tools and methods to the specific context of their own country. These principles include, for example, doing a household rather than school-based assessment in order to include all children; focusing on foundational reading and arithmetic abilities; and involving “ordinary citizens”, among others.

The ASER tool is also at the heart of Pratham’s model for remedial teaching, which is known as Teaching at the Right Level (TaRL), which uses the ASER assessment tool as a means to understand what children can do and then teaching them using

methods and materials designed to help them get to the next level. The TaRL model has been rigorously evaluated and found to be a highly effective means of improving children’s foundational abilities. Much like the ASER model before it, its simplicity and scalability is finding uptake in many countries. Given the scale of the learning crisis worldwide, not only for children out of school but also for those already in the system, there is an urgent need to generate robust evidence that can be directly linked to action on the ground to improve learning outcomes.

3.6 THE ROLE OF TWAVEZA EAST AFRICA (UWEZO) CITIZEN-LED ASSESSMENTS IN TRACKING LEARNING OUTCOMES IN EAST AFRICA

The implementation of policies and strategies geared toward achieving the MDGs in education in the 2000’s has led to huge progress in achieving universal primary education. By 2015, school enrolment rates in most developing countries increased to 95%. However, little was achieved in improving the quality of education. In order to propel a country to achieve its national goals, provision of quality education should go beyond access and adopt a system that develops knowledge, skills, values and attitudes. Thus, Education for Sustainable Development (ESD), which is enshrined within SDG 4, aims to ensure inclusive and equitable quality education that promotes lifelong learning opportunities to equip learners with relevant skills to tackle today’s global, environmental and social challenges.

Uwezo is an example of a CLA that offers a platform to track learning outcomes in basic literacy and numeracy for Indicator 4.1.1 in Grade 2 or 3.

3.6.1 Uwezo and other CLAs⁴⁷

Uwezo is conducted nationally at the household level in East Africa (Kenya, Uganda and the United

Republic of Tanzania). The Uwezo message – and all CLA initiatives united under the PAL Network – that “Schooling isn’t leading to learning” has gained traction globally. In late September 2017, the World Development Report 2018, *Learning to Realize the Promise of Education*,⁴⁸ was published. Its first main message stated that “schooling is not the same as learning”. This was a core message that Uwezo has helped to reveal and amplify since 2009. It was inspired by India’s ASER (see Section 3.5) and amplified by the PAL Network of CLAs.

Over the past decade, the growing family of household-based, citizen-led basic assessments of reading and arithmetic has proven that it is possible to engage citizens to measure basic learning outcomes of children and to use those results to spark change. In recent years, this innovative approach to learning assessment has been implemented in several Asian and African countries. Using basic reading and arithmetic tasks, organized groups of citizens in these countries have been systematically assessing for themselves what their children are able to do.

East Africa’s Uwezo CLA initiative has several key features, common to all CLAs under the PAL Network. This is to ensure that all children are represented in the sample. SDG 4 is about education for *all children* but not all children are enrolled in school. Furthermore, daily attendance in school may be very low in some countries and therefore the household is the place to find most of the children.

CLAs use rigorous sampling methodologies to generate representative samples of children at national and sub-national levels. This unique feature of targeting all children enables Uwezo citizen-led surveys to provide better coverage of the target population. This is specially the case in hard-to-reach poorer areas that may be excluded from the international standardised school-based or household surveys. These surveys are the basis for many of the estimates used in assessing progress towards SDG 4 (Carr-Hill, 2017).

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48 <http://www.worldbank.org/en/publication/wdr2018>