Inside Primary Schools

A study of teaching and learning in rural India

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असर
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PREFACE

Walking up the mountain for several hours in a district of Himachal Pradesh to reach one of the 900 schools and more than 20,000 households visited in the course of this study, we met communities who provide every support for the education of their sons and daughters and all children of their neighbourhood. Even in the remotest village, the school is a pillar of hope for children's development and their future. You will find a building nicely coloured and decorated with maps, poems or other images meant to support children's learning. Children play in the yard and line up gleefully for the Mid Day Meal. Parents participate in school life and give support for their children to review their lessons at home. Teachers often times laugh and smile with the children during their non-academic interaction. The environment of the school seems welcoming to children.

However, something happens when we try to translate this environment into better learning outcomes for children. Studies conducted by Government and civil society have told us that learning levels are not meeting the goals set out in the Right of Children to Free and Compulsory Education (RTE) Act, which mandates child-centered, child-friendly learning. This study is an attempt to figure out why and to identify what elements may make the difference. What is happening – in the teaching-learning process, in the school environment or at home – that hinders children from learning and from accessing their right to at least eight years of quality education?

The good news is that, overall, children are learning, but when we look at the evidence, we get a clearer picture of why gaps persist even when required inputs into the school are in place. Each child dutifully sits in a row with his or her bag full of textbooks and notebooks which they study while the teacher is occupied with another class (since 2 out of 3 classroom are multigrade). Results tell us that these textbooks may not be developmentally appropriate for children, since even in states with the strongest learning results, the majority of children and even the high scorers are not able to meet the mark of what's expected from their books. The textbook may be the

only learning material present, even though regular access to library books can improve children's learning levels. Children's work is unlikely to be on display. Teachers who may have been smiling during morning assembly or recreation are generally not observed carrying this warm demeanour into their teaching in the classroom, although the evidence tells us this also improves children's learning.

But in the classrooms where we do see these elements, children learn better. The results from this study provide indications of what we might do differently to reach learning goals. Some of these indications are simple to implement, i.e. time tables in school followed consistently, additional teaching and learning materials, regular reading of library books, unlocking girls' toilets to ensure access, encouraging children to ask questions. However, the evidence also indicates that substantial reform is required in teacher training to insure more child-centered teaching tools and methods, and in assessing teachers' skills and teaching ability to ensure real learning. The evidence also points to the need to reform textbooks to be more appropriate for children's age and ensure better mastery of the foundations of early literacy and numeracy that are the building blocks required to meet the goal of all children completing elementary education and beyond.

With a little push and support, each and every child can reach the summit of her potential. Each school can create a safety net to catch those who may be the most at risk of dropping out or not learning. The results of this study can tell us "why", but for every reader and user of the information contained here, and all the teachers and parents and officials we met on the path of this work, the questions to ask is "what," as in "what can be do to help children learn better?" We sincerely hope that this research will help find further solutions so that every school we visit in the future will be full of happy, smiling girls and boys and teachers in joyful classrooms where learning climbs in leaps and bounds.

INTRODUCTION | 1

The context for this study

Parents send their children to school because they believe they will acquire the skills, abilities, values and habits that will enable them to become productive adults. With 13% of the country's population currently under six years of age,[1,] the country's ability to deliver these outcomes will affect its future prosperity in no small measure.

The Government of India has implemented a range of initiatives to ensure that schooling is indeed accessible to all children. Over the past decade, India's annual budget for elementary education has risen steadily, and is currently Rs. 21,000 crore.[2] Basic school infrastructure has been put in place across the country: classrooms and toilets have been built, in many states thousands of teachers have been hired, and most villages now have a school within one kilometre. This remarkable push towards universal coverage has led to more than 96% of all children being enrolled in school.[3] For a country as large and complex as India, these are no mean achievements.

Yet very often, we forget that schools and teachers have no intrinsic value in and of themselves. They exist to help children *learn*.

Literacy and numeracy are essential components of learning, the basic building blocks without which desired schooling outcomes, however defined, cannot take place. Yet despite massive investments in primary education, many children are not acquiring even basic abilities in reading and arithmetic. The Annual Status of Education Report (ASER), conducted each year since 2005 in all rural districts of the country, shows that in 2010, 53% of Std 5 children in rural India could read a Std 2 level text and 36% could solve a three digit by one digit division problem. Nationally, this situation has hardly changed over the six year period for which ASER data is available.

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1   Census of India (2011): *Provisional Population Tables*, Table 2.

2   Budget allocated to the Sarva Shiksha Abhiyan. Figure taken from Union Budget of India. *Key Features of Budget 2011–12*. Released on February 28, 2011 by Ministry of Finance [http://indiabudget.nic.in/ub2011-12/bh/bh1.pdf].

3   The Government of India reports a Net Enrollment Ratio (NER) of 98.3% for 2009–10. According to ASER 2010, 96.5% of all children in the 6–14 year age group are enrolled in school.

Other data on learning achievement, such as that produced by Education Initiatives or the Government of India's own assessments, use different methodologies and indicators, but also demonstrate that learning outcomes at the primary stage are far from satisfactory.[4] A similar complaint emerges at the other end of the educational spectrum, with an increasingly vocal chorus of voices complaining that students with undergraduate or graduate degrees lack the basic skills and abilities that constitute 'employability', requiring companies to invest massively in retraining programs to ensure an adequate supply of trained manpower to fuel the country's economy. Clearly, there is a need to understand how much 'value added' is generated by the investment of thousands of hours of a student's life in educational institutions, and what aspects of schooling facilitate – or hinder – the process of adding value.

In the context of elementary education, the landmark Right of Children to Free and Compulsory Education Act, in force since April 2010, has generated a series of huge challenges for the country – but equally, enormous opportunities. As states prepare to hire thousands of teachers to meet RTE norms on pupil:teacher ratios, the time is right to reconsider the norms and criteria that guide teacher recruitment and training. As states think about how to bring children currently out of school into the age-appropriate grade, the time is right to think about how to help the thousands of children already in school achieve levels of learning appropriate to their grade.

As the proliferation of private schools and tuition classes shows,[5] parents across the length and breadth of the country are pinning their hopes on education as the stepping stone to a better life for their children. The time is right to think about what our schools can do to ensure that these aspirations are fulfilled, so that not just schooling, but *learning* is guaranteed to every child. This is the true spirit of the RTE Act.

However, this sort of rethinking requires a realistic assessment of conditions on the ground today. Going

beyond an evaluation of the inputs that are provided to schools in terms of classrooms, teachers, and textbooks, it requires an analysis of the ways in which these inputs are organized and used by schools, and more importantly, of the ways in which different patterns of school and classroom organization, varying teacher characteristics and textbook expectations relate to better or worse learning outcomes among students.

This study is one step in that direction.

Coverage and methodology

The scaffolding of this study is influenced by two main strands of work in recent years. First, the Annual Status of Education Report (ASER) has periodically included school visits and basic observations regarding infrastructure, enrollment, attendance and a few other indicators (ASER 2005, 2007, 2009, 2010). The data collection was carried out on one random day in the school year in the October–November period. Thirty schools in each rural district are covered; in 2010 ASER visited 13,000 government primary schools across the country.

Second, the School Teachers Effectiveness and Learning Levels of Students (SchoolTELLS) study, carried out in 2007–08, was an in-depth, comprehensive study of 160 schools across 10 districts in Uttar Pradesh and Bihar which explored a variety of village, teacher, student, and household characteristics along with different dimensions of functioning of schools, organization of classrooms, use of time etc. The study was led by Dr. Geeta Kingdon of the Institute of Education, University of London and covered both private and government primary schools.

The present study builds on the SchoolTELLS methodology and approach in a number of ways. The study tracks about 30,000 children over a period of one year. Although the scale is considerably larger, the

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4   See for example the Municipal School Benchmarking Study 2007, Educational Initiatives, available at: http://www.ei-india.com/wp-content/uploads/ EI_WP_Series_6_-_Municipal_School_Benchmarking_Study.pdf. SSA also has data on learning levels of students available at: http://ssa.nic.in/page_ portletlinks?foldername=quality-of-education.

5   ASER findings show that percentage of children enrolled in private school and taking paid tuition classes has increased substantially between 2007 and 2010.

sample is restricted to government primary schools and students only. It covers five states across the country: Andhra Pradesh, Assam, Himachal Pradesh, Jharkhand and Rajasthan; within each state, three districts were selected on the basis of geographical location and socioeconomic indicators. In each district 60 government schools with primary sections were sampled, and up to 25 students from Std 2 and another 25 from Std 4 were then randomly sampled from the enrollment registers of each of these schools. In summary, the sample is drawn from 15 districts located in 5 states, and consists of a total of 900 schools and close to 30,000 students. **Table 1.1** summarizes sample information.[6]
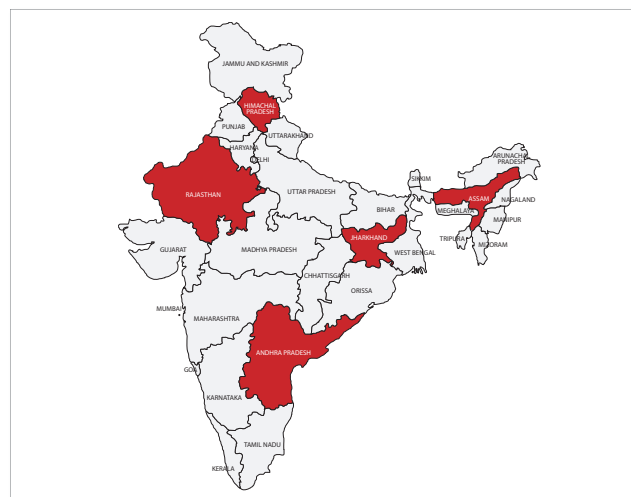
Table 1.1
Overview of the sample

State	District	Schools*	Households visited	Sample children**					
				Std 2			Std 4		
				Boys	Girls	Total	Boys	Girls	Total
Andhra Pradesh	Cuddapah	60	994	296	310	606	284	319	604
	Medak	60	1,636	483	518	1,023	473	556	1050
	Prakasham	60	1,234	398	521	919	443	453	897
	Total	**180**	**3,864**	**1,177**	**1,349**	**2,548**	**1,200**	**1,328**	**2,551**
Assam	Cachar	60	1,360	587	596	1,261	599	527	1199
	Dhubri	60	1,183	709	724	1,441	646	702	1360
	Dibrugarh	60	782	400	374	813	388	386	805
	Total	**180**	**3,325**	**1,696**	**1,694**	**3,515**	**1,633**	**1,615**	**3,364**
Himachal Pradesh	Chamba	60	1,214	361	328	690	380	349	736
	Mandi	60	1,148	330	300	631	381	327	710
	Sirmaur	60	1,302	371	362	737	414	418	835
	Total	**180**	**3,664**	**1,062**	**990**	**2,058**	**1,175**	**1,094**	**2,281**
Jharkhand	Deoghar	60	2,000	632	572	1,215	591	577	1177
	Giridih	60	2,079	616	627	1,244	553	580	1136
	Ranchi	60	1,827	555	577	1,136	520	589	1100
	Total	**180**	**5,906**	**1,803**	**1,776**	**3,595**	**1,664**	**1,746**	**3,423**
Rajasthan	Ajmer	60	1,906	646	578	1,245	558	461	1041
	Banswara	60	1,575	542	496	1,045	472	414	889
	Jodhpur	58	1,269	486	438	995	411	376	793
	Total	**178**	**4,750**	**1,674**	**1,512**	**32,85**	**1,441**	**1,251**	**2,723**
Total		**898**	**21,509**	**7,412**	**7,321**	**15,001**	**7,113**	**7,034**	**14,342**

From the original sample of 900 schools, two schools were closed during the first round of fieldwork; no data is therefore available for them.
*** Numbers for girls and boys may not add up to total children due to missing data.*

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6   More details on sampling are provided in Appendix 1. Additional information on sampled children, schools, villages and households is provided in Appendix 2.

Fieldwork for the study lasted about 15 months, and comprised a baseline and an endline learning assessment of each sampled student; three visits to each sampled school; observations of Std 2 and Std 4 classrooms; collection of background information and the administration of a 'teaching capability' assessment to each teacher; and visits to the households of each sampled child. **Table 1.2** provides an overview of these fieldwork tasks.

An overview of this report

Learning outcomes

At the heart of this study is an assessment of learning outcomes in language and mathematics for a large cohort of almost 30,000 Std 2 and Std 4 students randomly selected from the enrollment registers of government schools in five states across the country. Of this cohort, about 22,000 students were administered both a baseline achievement test in the period September-November 2009 and an endline test in the period September–November 2010. The two tests were thus administered roughly one calendar year apart but spanned two academic years, meaning that by the time the endline test was administered children had moved into Std 3 and Std 5. The same tools were used for both baseline and endline assessments, and were developed based on an analysis of the language and math textbooks used in primary grades in each of the sample states.

The tests themselves are unusual in a number of ways. First, the questions ranged from 'easy' (below grade level) to grade level competencies as specified by the relevant textbooks. This was done knowing that the majority of children in government schools in India are well below grade level. Second, they were administered one-on-one to each child individually in a process that took an average of about fifteen minutes for the Std 2 test and about thirty minutes for the Std 4 test. Third, they included oral as well as written skills. Some questions, such as letter and number recognition, were answered orally, whereas others required the child to write down the answer – for example a dictated word or a subtraction problem. And fourth, apart from basic reading and arithmetic ability, attempts were made to gauge children's ability to understand, express themselves, think critically and solve problems.

With these data, we attempt in **Chapter 2** to answer a question that is fundamental to any discussion on how to improve learning outcomes: *how much do children learn during a year in primary school?*

School organization

In order to address the question of why children's patterns of learning are what they are, three visits were made to each of the 900 sampled schools during the study period (September 2009 – November 2010). The objective of the repeat visits was to generate a picture

Table 1.2
Overview of fieldwork tasks

Domain	Visit 1 Sep-Nov 2009	Visit 2 Feb-Apr 2010	Visit 3 Sep-Nov 2010
Village		Village information	
School	School information	School information	School information
Teacher	Teacher background information		Teaching capability assessment
Classroom	Std 2 & 4 classroom observation		
Household		Household survey	
Child	Learning assessment, tracking	Tracking	Learning assessment, tracking

not just of the infrastructure available in each school, but also to look more carefully at school dynamics in terms of the organization and use of resources. **Chapter 3**, on school characteristics, covers key aspects of school organization and how these relate to student achievement:

- *People.* Regardless of the nature of the curriculum and the textbooks, both teachers and students need to be present in school so that the required content can be transacted. In India, teacher absenteeism and child absenteeism are both topics that have received scrutiny in the last few years.[7] While enrollment rates are high, attendance patterns of teachers and children vary considerably across the country.[8] In schools sampled for this study, who comes to school and how frequently? And how does children's and teachers' attendance correlate with children's learning?

- *Time.* Most schools are governed by the notion of a time table. The assumption is that school begins and ends at a certain time each day. The time in between is divided into "periods" of teaching with breaks for snacks, lunch and play. How do schools in our study organize their time? And do children in schools where time is structured according to curriculum requirements learn better than children in schools where this is not the case?

- *Facilities.* Under SSA, commendable progress has been made over the last few years in providing schools with basic infrastructure such as classrooms, water, toilets and boundary walls. The Right of Children to Free and Compulsory Education Act (2009) requires that all schools meet specified minimum infrastructural provisions. To what extent do the schools in our sample meet these requirements, and how do these relate to children's attendance and learning?

Classroom dynamics

Learning outcomes depend fundamentally on what happens inside the classroom, and major policy documents such as the National Curriculum Framework (2005) and the National Curriculum Framework for Teacher Education (2009) emphasize this fact. Classroom dynamics can vary enormously depending upon the objectives and ability of the teacher, the nature of the content to be transacted, the number and composition of the students, and the physical setting in which the class is taking place. But because documentation and analysis of classroom transactions is a complex task, these tend to be the domain of small-scale qualitative studies. As a result, little data is available on the extent to which Indian classrooms conform to the goals and expectations set out in policy documents.

As part of this study, a thirty minute classroom observation was conducted during the baseline field visit in more than 1,700 Std 2 and Std 4 classrooms from which students were randomly selected for the study, generating a total of over 800 hours of observation data. The tool consisted of a series of simple, easily observable characteristics or activities grouped into four major categories: classroom environment, teacher attitude, teaching methods, and student activities. **Chapter 4** discusses these data. The objective was to capture teaching-learning activities that were prevalent in sampled classrooms as well as to analyze which of these are associated with better student outcomes. In particular, the chapter looks at the concept of 'child friendly classrooms' and whether evidence from this study supports the belief that child friendly behaviours in the classroom are important to student learning.

Teacher characteristics and 'teaching capability'

The actual task of teaching children is entrusted to teachers, and our primary schools have a vast variety

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7   The study by Kremer et al. (2004) brought the issue of teacher absenteeism into sharp focus. Since then there have been a number of other studies looking at this issue. In 2007, the Government of India commissioned a study to investigate patterns of student absenteeism across states. See http://ssa.nic.in/page_portletlinks?foldername=research-studies.

8   See ASER 2005, 2007, 2009 and 2010 data for state level estimates of attendance (teachers and children) on a given random day visit to a school.

of them. In the schools included in this study, some teachers have postgraduate degrees while others have completed Std 10; some teachers have undergone pre- or in-service teacher training while many others have not. Some live in the same village as the students whom they teach while many commute long distances to school; they vary in teaching experience from a few months to decades. Some have permanent contracts as regular government teachers; others are hired on an annual contract; still others are community volunteers.

As states grapple with the question of how to find the numbers of teachers necessary to comply with RTE norms, it is important to ask the question: which of these teacher characteristics are associated with better student learning outcomes? During the first round of fieldwork for this study, every teacher who was present in the sampled schools was asked to fill out a detailed questionnaire on their background and teaching experience. **Chapter 5** reviews these data and takes a first look at the relationship between these self-reported teacher characteristics and student learning.

This chapter also includes a discussion of teaching capability among teachers covered by this study. It is often assumed that primary school content is so easy that 'anyone can teach it'. However, teaching requires a series of skills and abilities that go far beyond content knowledge, particularly when dealing with young children who are often first generation learners. The final round of fieldwork for this study, therefore, included a 'teaching capability assessment' which was administered one on one to every teacher who was willing to participate – about 1,800 teachers in all, comprising 59% of the teachers appointed in sampled schools.[9] In addition to content knowledge, the assessment attempted to capture:

- ◤ *What can be learnt from children's work.* Questions and answers from the test administered to Std 4 children in the same

schools were given to teachers, who were asked about children's responses. Teachers' ability to accurately assess children's responses is critical to the meaningful implementation of continuous and comprehensive evaluation mandated by the RTE Act.

- ◤ *How to explain to children.* It is not enough for teachers to understand the content in textbooks; they must be able to explain this content in simple language or easy steps. A number of tasks were included that attempted to capture the ways in which teachers explain content to children. These included meanings of difficult words, summaries of long texts, and steps in basic arithmetic operations.

As India prepares to implement the Right to Education Act, one of the key aspects of guaranteeing education will hinge on preparing teachers to teach effectively so that all children can learn. Empirical explorations of teaching and teachers' current capability to teach are critical elements for the satisfactory functioning of any school system. The

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9   Interestingly, teachers refused to participate in relatively few cases, partly because the questionnaire was anonymous, containing school identifiers but not those of individual teachers; and partly because the questions were framed as an assessment of *teaching* rather than of teachers.

current study is an important contribution to this domain.

Students' home background

As enrollments expand to cover populations that were earlier excluded from the education system, there has been a corresponding increase in the proportion of children from economically disadvantaged backgrounds, who are first generation school goers, and whose home language is different from the official medium of instruction in the school. If providing access to these students is a necessary first step, putting in place mechanisms that will help them *learn* requires a deeper understanding of who these students are and of the specific socioeconomic factors that act as barriers to learning.

Another motivation for collecting household characteristics was to be able to separate the effect of different determinants of learning. How much a child learns also depends on, for instance, the home learning environment, whether the child is getting additional help at home, and so on.

During the second round of fieldwork for this study (February–April 2010), therefore, household visits were conducted and detailed household information was obtained from the families of those sampled students whose homes could be located. Information on about 24,000 students – 83% of the total sample – was obtained in this way, including a household roster, information on employment and assets, indicators of the home literacy environment, and detailed questions on the availability of academic support to sample students outside of school. **Chapter 6** discusses these data in general terms, while **Chapter 7** looks specifically at the question of social equity and whether children from different backgrounds show different patterns of learning outcomes.

Summing up

As the preceding sections of this chapter suggest, this study collected a wealth of information on children currently enrolled in government primary schools in a wide variety of locations and contexts.

The longitudinal design of the study made it possible to assess the progress of each individual child over the course of a year. Simultaneously, data was collected on a wide range of domains thought to be associated with learning outcomes: children's schools were visited on three occasions, their classrooms were observed, their teachers' backgrounds were documented and their teaching capability assessed, and detailed information about their homes was obtained. The size of the sample made it possible to analyze these data in many different ways, and this report presents some of the broad trends and relationships observed. In **Chapter 8**, some implications of these data for policy and practice are discussed.

Acknowledgements

SOME MAJOR FINDINGS EMERGING FROM THIS STUDY

- 20% of children surveyed are first generation school goers. Less than half of all households have any print material available, so children do not have materials to read at home.

- Children are learning in the course of a year, but even in states with the best learning outcomes, children's learning levels are far behind what textbooks expect. At each grade level, children's starting point is well below that of their textbooks.

- Children whose home language is different than the school language of instruction learn less.

- Attendance is the most important factor in children's learning.

- The average number of children present in each classroom is low, but in most classrooms children from more than one grade are sitting together.

- Child-friendly practices, such as students asking questions, using local examples to explain lessons, small group work, have a significant impact on children's learning.

- Teachers can spot mistakes commonly made by children, but have difficulty explaining content in simple language or easy steps. Teacher characteristics such as qualification/degree, length of training, and number of years of experience make little difference to children's learning.

KEY POLICY RECOMMENDATIONS BASED ON THIS EVIDENCE ARE

- Textbooks need urgent revisions. They need to start from what children can do and be more realistic and developmentally appropriate in what children are expected to learn, with clear learning goals and sequence.

- Systems must be put into place to track attendance, not just enrollment, and ensure regular reporting and monitoring of this attendance.

- Mother tongue instruction and programmes for language transition need to be introduced and expanded.

- Teacher recruitment policies need to assess teachers' knowledge, but more importantly their ability to explain content to children, make information relevant to their lives and to use teaching learning materials and activities other than the textbook.

- State teacher education plans should invest in the human resource capacity of academic support structures, like Block and Cluster Resource Centres (BRC/CRC) and District Institutes of Education and Training (DIET), to enable them to help improve teaching and learning quality via in-service training and classroom visits.

- As per RTE, indicators for child-friendly education need to be defined and measured regularly as a part of the markers of quality.

- Libraries, with take home books for reading practice at the household level, should be monitored as part of RTE indicators. Family reading programmes could also be part of innovations to help support first generation school goers.

CHILDREN'S LEARNING: EXPECTATIONS AND REALITY | 2

Summary

In both language and math, there is a substantial gap between what textbooks expect and what children can actually do. Although children's learning levels do show improvement over the course of a year, most children are at least two grades below the level of proficiency assumed by their textbooks. Specific examples are provided below.

Language

- Out of the more than 11,500 Std 2 children tested, less than 30% could read simple words. A year later, when tested in Std 3, about 40% of these children could do so. However, children are expected to be able to read simple words in Std 1.

- Out of about 11,000 children tested early in Std 5, only 3 out of every 10 children were able to comfortably and fluently read a Std 3 level text. A substantial majority of children thus could not read a text designed for children two grades below them.

- By early Std 3, more than 70% of children were able to write letters dictated to them, although they are expected to be able to do so by Std 1.

- Even in high performing states, both Std 2 and Std 4 children have difficulty writing simple words correctly.

Math

- By Std 3, 75% of sampled children were able to solve numerical one digit addition problems (a level they are expected to achieve by the time they finish Std 1). However less than 20% could solve a one digit addition word problem.

- In Std 4, most children were able to recognize numbers under 100, but less than 30% could recognize numbers above 1000. Further, while children in this class could comfortably solve basic arithmetic operations, they struggled with word problems which required them to apply this knowledge.

Introduction

Available evidence indicates that learning outcomes in government primary schools in India are far from satisfactory. Both governmental evaluations and assessments carried out by other institutions, such as the Annual Status of Education Report (2005–2010) and Education Initiatives (2007), provide ample evidence that children's learning is well below grade level. However most of these assessments are based on cross-sectional data (one time or repeated cross-sections) that measure the learning levels of children at a particular point in time. Very few studies actually follow a cohort of children to track their progress over time.

One of the main reasons for sending children to school is so that they learn. With each year spent in primary school, children's ability to read, understand, write, and do arithmetic should rise. By tracking children through one school year, it is possible to see how much "value" in terms of learning is added. The current study follows a large cohort of almost 30,000 children in five states across one calendar year. The baseline measurement was done in September–November 2009 and the endline assessment was done in September-November 2010. It thus follows children over time from one grade to the next. The same assessment tool was used on both occasions to ensure comparable data across the two rounds of assessment.

The focus of this study is on students in Std 2 and Std 4. Except for ASER which is a basic oral test, very few studies focus on early grades as young children are more difficult to test. Yet, if learning deficits and gaps are visible in the early grades, evidence from assessments can be very useful in planning solutions. In later years, remedial action is more difficult to implement on scale. Further with the focus on age-grade mainstreaming in the recently passed Right to Education Act, the importance of generating and using data to inform practice becomes even more salient.

Understanding learning patterns in Std 4 is equally important. By this stage, children are reaching the end of the primary stage. If "learning for all" is to be achieved, or education to be "guaranteed", then it is critical that by the time children finish the primary stage, they are able to reach a satisfactory level of learning. It is only when the foundations are strong that the building will be able to support the weight of more construction.

Overview of assessment tasks

The assessment tasks included in the present study were administered one-on-one to each child individually in a process that took an average of about 15 minutes for the Std 2 test and about 30 minutes for the Std 4 test.

- They included oral as well as written skills. Some questions, such as letter and number recognition, were answered orally, whereas others required the child to write down the answer – for example, a dictated word or a subtraction problem.

- The questions ranged from easy to grade level competencies. This was done knowing that the majority of children in government schools in India are well below grade level.

- Apart from basic reading and arithmetic ability, attempts were made to gauge children's ability to understand, express themselves, think critically and solve problems.

Wherever children were present in school during the field investigators' visit, testing was done in school. If children were absent from school during that period, investigators went to their homes and tested as many of them as could be located. In all, 77% of the 15,001 Std 2 children and 76% of the 14,342 Std 4 children in the sample were administered both the baseline and the endline test. **Table 2.1** gives the state wise distribution of these children.

Learning outcomes: Language
Reading

What are children expected to be able to do in Std 2? To answer this question, we first analyzed Std 1 and Std 2 textbooks in each of these states.

Table 2.1

Sampled children who were administered both baseline and endline tests, by state

State		AP	AS	HP	JH	RJ	Total
Std 2	**All sampled children**	2,548	3,515	2,058	3,595	3,285	15,001
	% children administered both baseline and endline tests	72.8%	67.4%	93.7%	78.4%	79.3%	77.2%
Std 4	**All sampled children**	2,551	3,364	2,281	3,423	2,723	14,342
	% children administered both baseline and endline tests	76.4%	63.5%	94.0%	74.7%	79.6%	76.4%
Total	**All sampled children**	5,099	6,879	4,339	7,018	6,008	29,343
	% children administered both baseline and endline tests	65.5%	74.6%	93.8%	76.6%	79.4%	76.8%

In most states, by the end of Std 1, the chapters in the textbook have a variety of simple words that children are expected to read and to write. The Std 1 Himachal Pradesh textbook expects children to write simple words on their own: for example the names of domestic animals and wild animals (p. 129–130); they are expected to use letters to form words (p. 134). Both in Std 1 and Std 2, the chapters/texts are in the form of a story. In the Std 1 textbook in Rajasthan, children are expected to read the chapter, understand and be able to talk about what they have read. The exercises towards the end of the Std 1 textbook indicate that children are expected to write simple words and sentences as well

(for example see Rajasthan Std 1 textbook Chapter 30, *Diwali Aai*). The Jharkhand Std 1 textbook, developed by the National Council of Educational Research and Training (NCERT), does not specify any reading or writing goals.

With these expectations in mind, let us analyze what our sampled Std 2 children were able to do in the baseline and how far they had progressed a year later.

One of the tasks that children had to do in the language test was to read simple two-letter words. **Chart 2.1** shows the performance of children in word reading by state. Overall, less than one fifth of all children in the

Fig 2.1

Excerpt from the Std 1 textbook in Rajasthan
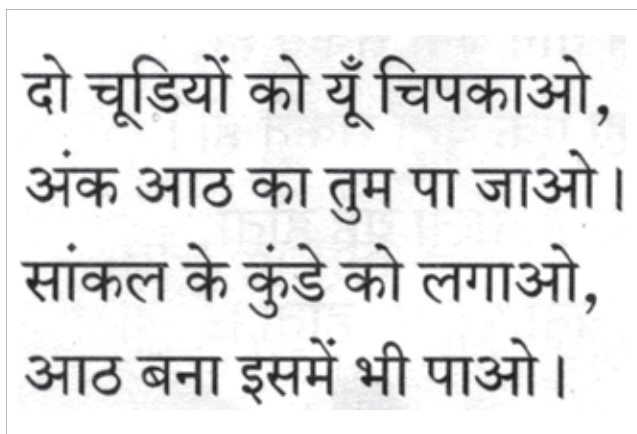
Chart 2.1

% Std 2 children who could read 2 letter words[1]

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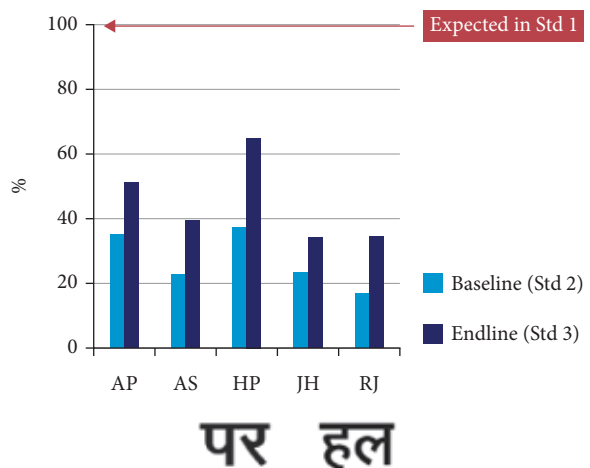
[1] Throughout this report, all data related to children's learning outcomes are for the subset of sampled children for whom both baseline and endline assessment data are available. See Table 2.1 for details.

baseline (i.e. early Std 2) are able to read these words. This number rises to about 42% in the endline. Simply put, by the beginning of Std 3 (when the endline was conducted), an average of almost 60% of children in our sampled schools still cannot do what is expected of them by the end of Std 1. These figures vary by state: in Andhra Pradesh and Himachal Pradesh over half the children can read words by the end of Std 2/beginning of Std 3, whereas in Jharkhand and Rajasthan this number is well below 20%.

Given that children's ability to read words is not very strong, it is to be expected that their ability to read text will also be poor. **Chart 2.2** shows children's ability to read text in the baseline and endline. A paragraph of 5 simple sentences was given to children. This paragraph was constructed based on analysis of the content in Std 1 level language textbooks. Children were asked to read the paragraph aloud, and were graded on the basis of whether they were able to read

the text at all, whether they read haltingly and/or made mistakes or whether they were able to read fluently.

The fluency with which children read is an important element in children's language development. Studies have shown that fluency in reading is highly correlated with comprehension (La Berge and Samuels 1974, Perfetti 1985). Hence building children's reading skill in early grades is critical for their future education. In all states, assessment results showed that Std 2 children made progress. But if textbook content and standards are used as the reference point, this progress was woefully inadequate relative to where children are expected to be by the time they are in Std 3. Even in the best performing state, Himachal Pradesh, only about a third of all children at the beginning of Std 3 can comfortably do what is expected of them by the end of Std 1.

What about older children? What are Std 4 children able to do at the beginning of the school year and thereafter? In the baseline, Std 4 children were asked

Chart 2.2
% Std 2 children who could read Std 1 level text fluently

Expected in Std 1
Baseline (Std 2)
Endline (Std 3)
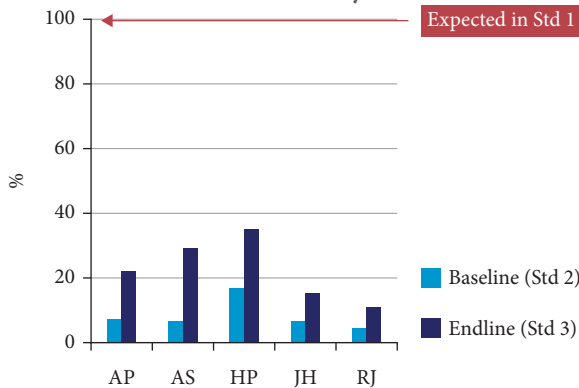
Chart 2.3
% Std 4 children who could read Std 3 level text fluently

Expected in Std 3
Baseline (Std 4)
Endline (Std 5)
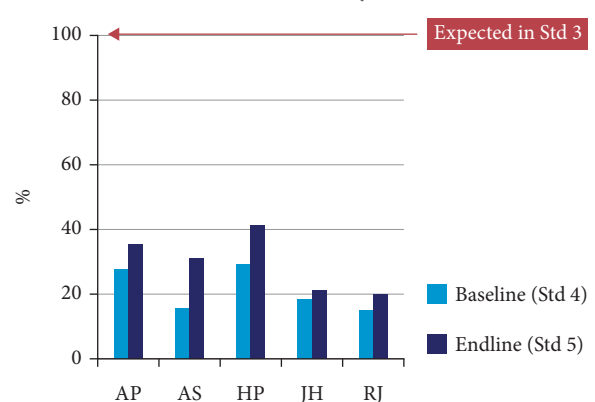
पढ़ो और पढ़ने के बाद कुछ सवालों का जवाब पूछें
Q10
राजू का एक बड़ा भाई है।
वह बड़े विद्यालय में पढ़ता है।
उसका भाई गणित में बहुत तेज़ है।
राजू की गणित कमज़ोर है।
इसलिए वह अपने भाई से रोज़ गणित पढ़ता है।

एक बार कस्तूरबा गाँधी बहुत बीमार हो गयीं। दवा से लाभ नहीं हो रहा था। गाँधी जी ने पढ़ा था कि बीमारी में नमक न खाने से लाभ होता है। गाँधी जी ने कस्तूरबा से भोजन में नमक बन्द करने के लिए कहा। परन्तु नमक के बिना कस्तूरबा को भोजन अच्छा ही नहीं लगता था। उन्होंने गांधी जी की बात न मानी। गाँधी जी ने

Reading is an essential skill; it provides the basic foundation for subsequent learning and access to meaningful education. Without learning to read and to comprehend, children cannot make further progress in the education system. The reading data underlines several important and worrying trends.

During the course of one year, children do learn. More children are reading words and paragraphs in the endline than in the baseline in both grades. However children's pace of learning is far lower than what is expected of them by the curriculum and textbook content. Even in the best performing states in the study, the reading figures are unsatisfactory if we compare children's actual reading levels to what is expected of them according to the textbooks.

to read a short paragraph of Std 3 level of difficulty.[2] In comparison to the paragraph used in the Std 2 test, this paragraph had longer sentences and some harder words (e.g. joint words).

The data in **Chart 2.3** above suggest similar patterns to those seen with younger children. Overall, by the endline about a third of all children were comfortably reading Std 3 level text. This means that even after four years of schooling, close to 70% of children cannot easily navigate text that is meant for children two grade levels below. In higher classes in primary school, children have to deal with a lot of textual material. In subjects like environment studies, difficulties in reading have to do not only with language issues (syntax, sentence structures, grammar etc) but also with conceptual understanding of vocabulary words, concepts and phenomena.

Writing

What about writing ability? In the Indian education system writing skills are very important given that at all levels, whatever assessment is done is based entirely on what children write. It is therefore surprising how little attention is paid in Indian primary schools to the development of children's ability to write on their own.

For writing, two common activities are done routinely and frequently in primary school classrooms across the country. One is copywriting - i.e. teacher writes on the blackboard and children copy in their notebooks, or else children simply copy text directly from the textbook into their notebooks. The other common writing activity in primary school classrooms is dictation. The teacher sounds out a word and children write it.

Table 2.2 shows the ability of children to do dictation tasks. By the beginning of Std 2, over half of all children could write letters that were dictated to them. This number rises to over 70% by the endline. However, as mentioned earlier, Std 1 textbooks expect children to be writing these simple words on their own by the end of Std 1. Even by the endline when children had moved into Std 3 in most states, barely

Table 2.2
% Std 2 children who could write correctly

State	Dictated letters		Dictated words	
	Baseline	**Endline**	**Baseline**	**Endline**
Andhra Pradesh	67.8	86.4	42.1	44.9
Assam	57.6	72.2	37.8	63.3
Himachal Pradesh	66.9	82.6	54.1	71.5
Jharkhand	56.7	62.0	43.6	46.7
Rajasthan	44.0	71.9	32.6	50.4
Total	**57.5**	**73.6**	**41.4**	**54.7**

ज, प, ल, ह
नल

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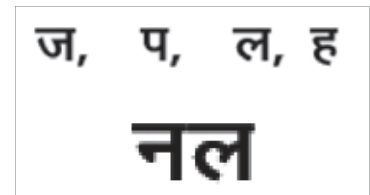
2   These texts were prepared after a detailed analysis of Std 3 textbooks across the five states in the study.

Table 2.3
% Std 4 children who could write correctly

State	Dictated "easy" word		Dictated "hard" word	
	Baseline	**Endline**	**Baseline**	**Endline**
Andhra Pradesh	35.7	48.4	23.7	34.1
Assam	37.8	60.3	12.2	48.2
Himachal Pradesh	50.1	65.0	32.8	54.6
Jharkhand	34.8	30.6	18.9	18.7
Rajasthan	35.1	40.6	34.5	49.3
Total	**38.6**	**48.3**	**24.3**	**40.3**

जंगल

विज्ञान, स्वीकार
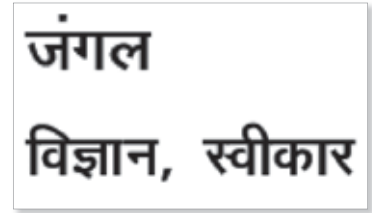
more than 50% could correctly write a simple word that was dictated to them.

The links between reading and writing are interesting and need much more analysis. Comparing the figures in Chart 2.1 with those in Table 2.2, we find that more children are able to correctly write dictated words than can read words of a similar level of difficulty. Given that word dictation involves sounding out sections of a word, this suggests that writing down dictated words is simply a question of writing a letter with the vowel sound.

Older children were given two dictation tasks. The first set of words contained simple words not dissimilar to the words given to Std 2 children. The second set of words contained "harder" words that had joint letters in them.

As with Std 2 children, the proportion of Std 4 children who could correctly write simple words dictated to them increased between baseline and endline. However, older children are expected to transact much more difficult text in terms of "harder" words (see for example Fig 2.2). Even by the endline, overall, barely

40% of all children could write these dictated hard words correctly (**Table 2.3**).

Another common writing activity expected of children is writing answers based on questions from a given text. This question-answer activity is routinely done in Indian classrooms from early grades onwards. Analysis of textbooks from the states in the study indicates that by Std 2 children are expected to read text (often well over 200 words in length), understand the content and write answers to written questions based on the text.

For this study, both Std 2 and Std 4 children were given a short paragraph to read in the language that was the medium of instruction in the school. They were then asked questions on the basis of the paragraph. Whether the child was able to read or not, the paragraph was read out twice to the child. Each question was asked twice. Both classes were asked direct text retrieval questions; Std 4 children were additionally asked a question that required them to synthesize information provided in the text. The grading of writing was done for meaning (the "correct" answer had to be in the sentence) and for basic grammar. Two spelling mistakes were forgiven.

Fig 2.2
Excerpts from the Std 4 textbook in Jharkhand

एक व्यक्ति ने कहा, "भगवान की कृपा से लाखों रुपए राजकोष में मौजूद हैं। जैसे धन का सागर हो। उसमें से एक–आध लोटा ले लेने से महाराज का क्या नुकसान हो जाएगा!"

क्रीडा } = खेल-कूद की
प्रतियोगिता } प्रतियोगिताएँ
विजयिनः = जीत हासिल करनेवाले
प्राप्नुवन्ति = प्राप्त करते हैं
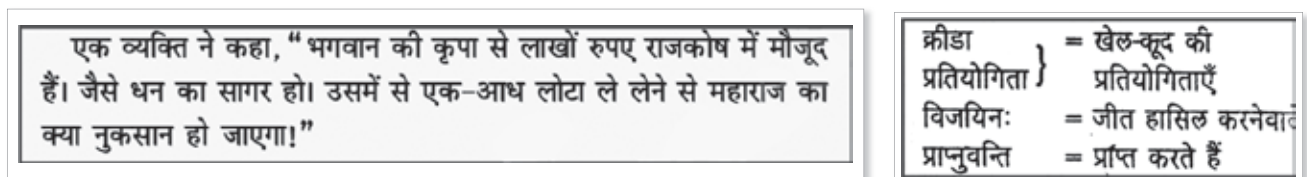
Table 2.4

% Std 2 & Std 4 children who could write an answer to a question from a given text

State	Answer to a direct text retrieval question		Answer to a synthesis question
	Std 2	Std 4	Std 4
Andhra Pradesh	17.8	24.8	28.4
Assam	9.7	5.4	2.5
Himachal Pradesh	11.6	13.3	10.3
Jharkhand	1.0	1.2	0.6
Rajasthan	6.8	7.3	5.1
Total	**8.5**	**9.8**	**8.7**

Note: Std 2 and Std 4 students were given different texts.

Fig 2.3

Example of text and questions asked of Std 4 children

The reading-dictation figures are low, but the comprehension and writing data from Std 2 suggests that even in relatively educationally advanced states like Andhra Pradesh, children are struggling to write easy things correctly (**Table 2.4**). Despite the fairly lenient grading instructions, we find that the ability of children to correctly formulate and write sentences on their own is exceedingly low, even in Std 4.

Changes from baseline to endline

Comparing results from the baseline and endline provides a broad indication of how much learning took place in our sampled schools during the course of one year, by capturing the overall changes in children's test scores at the beginning and end of this period. **Charts 2.4 and 2.5** show the change in mean total language scores from baseline to endline for each state in the sample.

Beyond the change in mean scores, an examination of changes in the *distribution* of total scores is a useful way of understanding whether specific groups of children gained more than others. For example, did children who did poorly in the baseline show the biggest jump, or did children who were doing relatively well to begin with also show the most improvement? The charts in **Charts 2.8** and **2.9** at the end of this chapter summarize these changes for each state. Looking at patterns of language learning across the states in our sample, in the Std 2 language test results for both Assam and

Chart 2.4

Baseline and endline mean language scores in Std 2, by state (%)
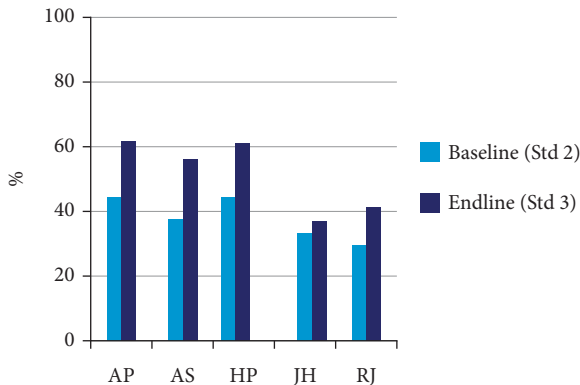
Chart 2.5

Baseline and endline mean language scores in Std 4, by state (%)
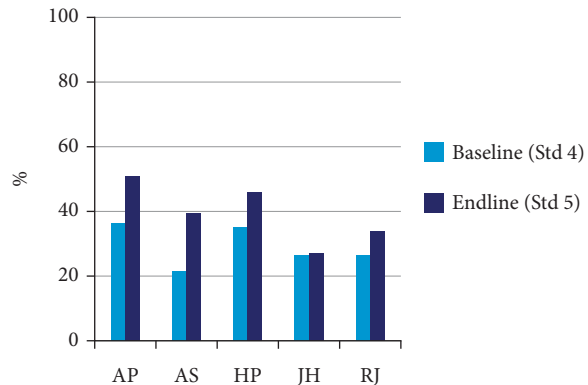
Andhra Pradesh, we see a shift in the overall distribution of scores towards the right in the endline, indicating a substantial decrease in the proportion of children who are low performers and increase in the fraction of children scoring 60% or higher. Further, the percentage increase of children scoring higher in the endline and the accompanying percentage decrease in children scoring lower shows there has been progress for both low performing children as well as high performing children in these two states. Himachal Pradesh results show an even more pronounced shift towards higher scores throughout the distribution. Jharkhand does not show any improvement for the lowest performers from baseline to endline but like Rajasthan the rest of the distribution shows a rightward shift. This distribution of scores for each state is similar for children in Std 4 although the percentage point improvement in levels over a year is generally lower than in Std 2.

Learning outcomes: Mathematics

For the math assessment, children were given a variety of tasks, some of which had oral answers while others required written answers. As with the language test, children were tested individually, one on one.

Std 2 children first did some counting tasks where they had to count objects in a given picture and say the total number out loud. The maximum number of any object in the picture was less than 10. Most children (close to 80%) could easily do the oral counting tasks.

To analyze the level at which children could solve arithmetic problems in Std 2, they were asked a number of numerical and word tasks. **Table 2.5** gives an indication of children's ability to solve different types of addition problems.

By the end of Std 2, most children are easily able to handle one digit addition problems (a level they are expected to reach by the time they finish Std 1). However, they seem to be struggling with word problems as well as addition problems that require carryover.

By the time children get to Std 4, depending on the state, they are expected to know numbers well above 1000. **Table 2.6** shows the percentage of children who correctly recognize different numbers.

These figures indicate that most children early in Std 4 can recognize numbers under 100. However as the numbers get higher, children's ability to recognize them drops. Even by the endline, less than half of all children tested in some states were able to recognize numbers above 1000.

How well are children in their last year of primary school able to deal with basic arithmetic operations? Again we can see vast gaps between the expectations articulated in textbooks and children's actual knowledge on the ground. By early Std 4/early Std 5, a very high proportion of children can do simple numerical addition problems with numbers up to 100. However, word problems where knowledge has to be

Table 2.5
% Std 2 children able to do different kinds of addition problems

State	1 digit addition problem		2 digit addition problem with carryover		1 digit addition word problem	
	Baseline	Endline	Baseline	Endline	Baseline	Endline
Andhra Pradesh	72.0	86.2	27.6	50.5	17.5	31.5
Assam	60.9	80.2	19.0	41.6	25.4	27.7
Himachal Pradesh	66.7	77.8	21.8	41.8	12.1	22.9
Jharkhand	64.9	63.2	21.6	16.0	14.8	11.0
Rajasthan	48.0	71.4	14.1	21.8	7.1	9.6
Total	**61.7**	**74.6**	**20.4**	**32.4**	**15.2**	**19.4**

Q4

4
+2
____

4 6
+ 2 8
____

Table 2.6
% Std 4 children able to recognize different numbers

State	2 digit number		3 digit number		5 digit number	
	Baseline	Endline	Baseline	Endline	Baseline	Endline
Andhra Pradesh	94.3	98.5	86.9	94.3	39.4	59.4
Assam	74.0	92.0	42.0	70.4	8.6	18.1
Himachal Pradesh	92.5	94.9	71.8	82.8	28.8	44.8
Jharkhand	85.5	73.8	55.1	51.3	12.9	16.0
Rajasthan	85.8	90.5	44.2	58.0	6.9	11.7
Total	**86.2**	**89.2**	**59.3**	**70.2**	**18.7**	**28.9**

```
    5
   29
  354
 4720
55397
```

Table 2.7
% Std 4 children able to correctly solve different addition and subtraction problems

State	Numerical: 2 digit addition without carryover		Word problem: 3 digit addition problem		Numerical: 3 digit subtraction problem with borrowing		Word problem: 2 digit subtraction problem	
	Baseline	Endline	Baseline	Endline	Baseline	Endline	Baseline	Endline
Andhra Pradesh	89.0	94.7	52.8	68.1	34.1	45.2	51.4	71.8
Assam	66.5	82.2	18.7	38.7	13.5	29.1	26.0	61.0
Himachal Pradesh	85.4	91.9	42.4	51.5	29.5	40.3	42.7	57.9
Jharkhand	82.5	77.7	22.8	23.0	22.7	19.2	42.9	40.1
Rajasthan	79.1	82.3	25.8	27.6	16.4	18.0	35.9	45.0
Total	**80.4**	**85.3**	**31.8**	**40.6**	**23.0**	**29.6**	**39.7**	**54.3**

```
  700
 -457
 ────
```

मोनू के पास 95 रूपये थे। मोनू ने पिंकी को 40 रूपये दे दिये। अब मोनू के पास कितने रूपये बचे?

applied as well as higher numbers seem to cause Std 4 children considerable difficulty. **Table 2.7** summarizes the results for some addition and subtraction problems used in the Std 4 math test.

Not surprisingly, given this situation, a high proportion of Std 4 children are struggling with basic multiplication and division. And as **Table 2.8** shows, a majority of children are unused to applying their knowledge to problem solving.

Changes from baseline to endline

Overall, across all states in the sample, math learning outcomes improved by 10 percentage points in Std 2 and by 7 percentage points in Std 4, with substantial variations across states (**Charts 2.6** and **2.7**). The charts provided in **Charts 2.8** and **2.9** at the end of the chapter provide a more detailed analysis of changes in the distribution of these scores, which also shows major differences across states. We see substantial improvements in learning levels in Assam and Rajasthan, where the distribution of total score has shifted to the right, indicating an overall increase in test scores from baseline to endline. Further, in both states a considerable decrease in the percentage of children who scored poorly on the test is accompanied by a large increase in proportion of children who scored highly, implying progress for both high performing and low performing children. Improvements are also seen

Table 2.8

% Std 4 children able to solve different types of multiplication and division problems

State	Numerical: 2 digit by 1 digit division		Word problem: 2 digit by 1 digit division		Word problem: 2 digit by 1 multiplication		Numerical: 3 digit by 1 digit multiplication	
	Baseline	Endline	Baseline	Endline	Baseline	Endline	Baseline	Endline
Andhra Pradesh	46.2	58.1	31.7	40.3	66.9	77.2	25.6	38.3
Assam	25.6	44.5	13.5	29.6	40.9	67.1	11.3	24.0
Himachal Pradesh	37.1	49.9	17.9	23.0	50.7	64.8	25.8	40.4
Jharkhand	39.7	26.8	27.4	22.2	49.8	61.9	15.8	21.3
Rajasthan	29.4	27.2	14.2	19.2	38.4	61.7	7.8	14.2
Total	35.6	40.4	21.0	26.4	49.0	66.2	17.1	27.2

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  6 2 7
X 2 5
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रमा दीदी ९० बिस्कुट 5 बच्चों में बराबर बाँटती हैं। तो बताओ हर बच्चे को कितने बिस्कुट मिलेंगे?

Chart 2.6

Baseline and endline mean math scores in Std 2, by state (%)
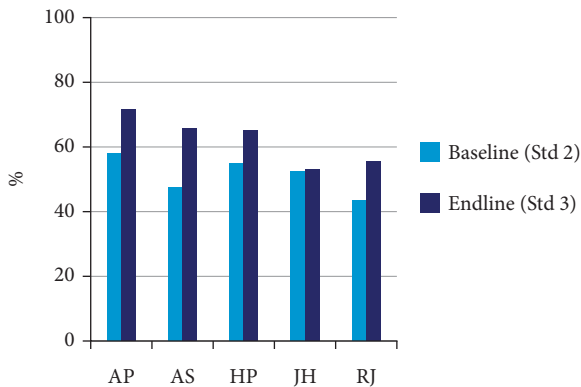
Chart 2.7

Baseline and endline mean math scores in Std 4, by state (%)
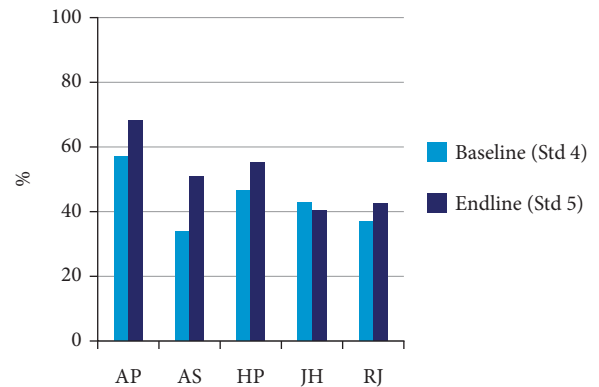
in the overall test scores of sample children in Himachal Pradesh and Andhra Pradesh, particularly with regards to the proportion of children who scored in the highest quintile on the test.

In stark contrast to the other four states, Jharkhand shows virtually no change in the distribution of test scores in math between baseline and endline assessments, indicating little to no improvement in overall learning levels.

Again as was the case for the language test, the distribution of scores for children in Std 4 in all five states was similar to the distribution in Std 2.

Implications of these findings

The analysis of the performance of children in the language sections of the children's assessment leaves us with many deep worries. Although children do progress from the baseline to the endline, the level achieved by most children in the endline is insufficient for most of them to engage with textbook content in the ways that are expected of them.

Looking at examples from the textbook and matching them with the findings is very instructive. For example: if we track the progression of chapters in the Himachal Pradesh textbook we see that letters and matras (vowel

sounds/signs) are introduced gradually through simple sentences and paragraphs. By the middle of the Std 1 textbook, children are expected to read simple sentences ("*barsaat ka mausam tha. Kaley kaley badal chha rahe they.....*"), do vocabulary exercises (singular, plural, filling in the blanks), writing practice (via copywriting words) and then finally question answers based on the text. Himachal's expectations of reading, writing and speaking in Std 1 are very close to the Std 2 assessment tasks used this study. Based on overall test scores, Himachal is one of the best performing states. Yet, even in this state, endline line results show that only half of Std 2 children (who had moved on to Std 3 in school) could read fluently at the Std 1 level.

Rajasthan is one of the lower performing states in our study. But Rajasthan's expectations of Std 1 children are even higher than those in Himachal Pradesh. For example, the exercises/assessment tasks (*Pahali parakh* p. 25 and *doosri parakh* p. 43) indicate that children must be able to read text which has words like "*veena*", "*richa*", "*angan*", etc. Chapters in this part of the Std 1 textbook are more than 200 words long and children are expected to do a number of activities with them. In Rajasthan at the beginning of Std 3, around 10% of Std 2 children could read Std 1 level text fluently.

Jharkhand uses NCERT textbooks; since they do not outline any reading or writing goals, it is hard to establish what children are expected to be able to do by the end of Std 1. However, looking at Jharkhand's endline results we see that only 15% of children in Std 3 could read easy Std 1 level text fluently.

Thus, while there is progress from the baseline to endline in every state, even in the best performing state, reading levels are well below what is currently expected from children according to state textbooks. At minimum, by the endline stage, all children should be reading simple text fluently.

For math, based on Himachal Pradesh textbooks, by the end of Std 2 children are doing numerical operations like addition with three 3-digit numbers and subtraction with borrowing using numbers between 100 and 999. They are also exposed to word problems involving simple multiplication and division (e.g., "one year has 12 months, so in 4 years, how many months will there be?" Or, "one minute has 60 seconds so how many seconds will there be in 8 minutes?") Again, as seen earlier, Himachal Pradesh is among the top performing states in our study. Yet in the endline for Std 4 which was actually done once children had reached Std 5, we find that only about 50% of children were able to correctly do word problems with the basic arithmetic operations that were expected of them by the end of Std 2. The same analysis with the other states like Jharkhand and Rajasthan for Std 4 math shows that a low proportion of children are able to do problem solving tasks especially with numbers that are in 2–3 digits and although they make progress during the year, the endline level is still extremely low.

These findings should give us all very serious pause to think. First, we need to debate what learning goals should be formulated for the early grades. Next, we need to consider the basis on which basic learning goals should be designed, reviewed and refined. Third, how can the current levels of what children can do as well the actual pace at which they learn be factored into the discussion? This is a critical task that requires action by educational planners, curriculum designers and pedagogy experts. The expected levels of learning that can currently be deduced from textbook content

Either we have to work much harder to accelerate children's learning (reading, writing, speaking, comprehending) to reach the expected levels or else the galloping pace of the textbook content needs to be brought down to reasonable and appropriate levels which keep children's actual learning trajectories in mind. Any re-writing of textbooks needs to be child-friendly and child-centered as mandated by RTE, which indicates that content and the pace of learning should be based on evidence of what works best to improve children's learning.

indicate that children are left far behind very early with little scope for them to catch up. Although children do learn some things during the course of the school year, the level that they attain is insufficient for them to get to an adequate or comprehensive level of learning as currently expected, or build the foundation for learning in higher grades. While children are learning (probably by themselves) simpler skills, the curriculum and textbook content that is being transacted in the classroom is well out of reach for most of them. This makes the teaching-learning process in our usual classrooms mismatched with what most children can currently do.

Either we have to work much harder to accelerate children's learning (reading, writing, speaking, comprehending) to reach the expected levels or else the galloping pace of the textbook content needs to be brought down to reasonable and appropriate levels which keep children's actual learning trajectories in mind. Any re-writing of textbooks needs to be child-friendly and child-centered as mandated by RTE, which indicates that content and the pace of learning should be based on evidence of what works best to improve children's learning.

The Right to Education Act specifies that "age appropriate mainstreaming" is a goal that needs to be achieved. Ironically, although this goal was formulated keeping out of school children in mind, the majority of children currently enrolled and attending government schools in primary grades are substantially and significantly behind the grade level expected of them at their age. Large scale and detailed empirical work like this study will help to bring urgent national attention, discussion and debate on how to structure our education system to enable all children to have a real chance to learn well.

Chart 2.8
Baseline and endline score distributions: Std 2

Language	Math

Andhra Pradesh

Baseline (Std 2)
Endline (Std 3)

Language score (%)

Andhra Pradesh

Baseline (Std 2)
Endline (Std 3)

Math score (%)

Assam

Baseline (Std 2)
Endline (Std 3)

Language score (%)

Assam

Baseline (Std 2)
Endline (Std 3)

Math score (%)

Himachal Pradesh

Baseline (Std 2)
Endline (Std 3)

Language score (%)

Himachal Pradesh

Baseline (Std 2)
Endline (Std 3)

Math score (%)

Language	Math

Jharkhand

% students vs Language score (%)

Legend: Baseline (Std 2), Endline (Std 3)

Jharkhand

% students vs Math score (%)

Legend: Baseline (Std 2), Endline (Std 3)

Rajasthan

% students vs Language score (%)

Legend: Baseline (Std 2), Endline (Std 3)

Rajasthan

% students vs Math score (%)

Legend: Baseline (Std 2), Endline (Std 3)

Chart 2.9
Baseline and endline score distributions: Std 4

Language	Math

Andhra Pradesh

Andhra Pradesh

Assam

Assam

Himachal Pradesh

Himachal Pradesh
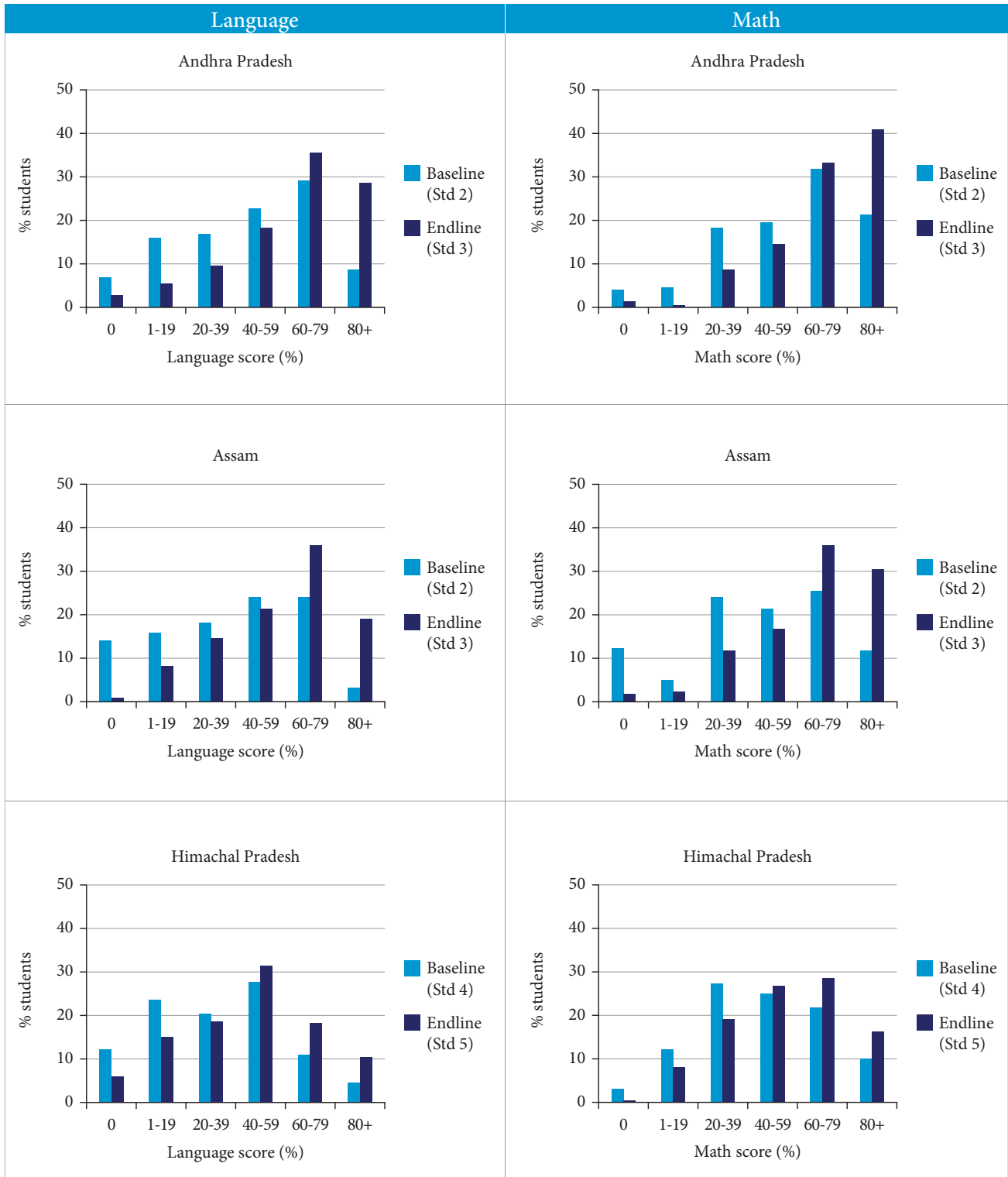
Chart 2.9, continued
Baseline and endline score distributions: Std 4

Language	Math

Jharkhand (Language)

% students / Language score (%)

Baseline (Std 4)
Endline (Std 5)

Jharkhand (Math)

% students / Math score (%)

Baseline (Std 4)
Endline (Std 5)

Rajasthan (Language)

% students / Language score (%)

Baseline (Std 4)
Endline (Std 5)

Rajasthan (Math)

% students / Math score (%)

Baseline (Std 4)
Endline (Std 5)
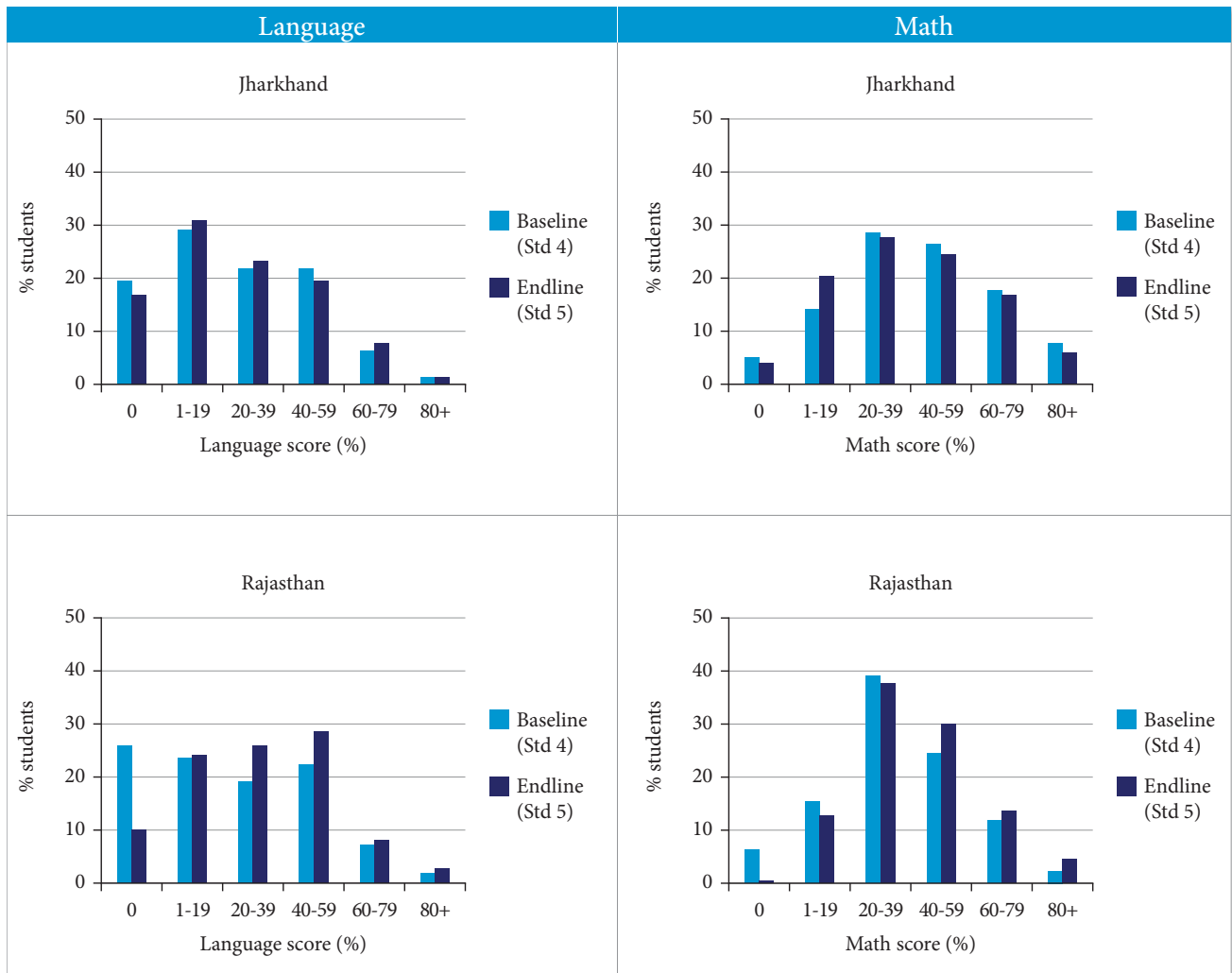
SCHOOL FUNCTIONING 3

Summary

This chapter addresses different aspects of school facilities and functioning, and how these relate to student learning outcomes. Three major aspects are explored: availability of people, organization of time, and availability of facilities.

Who comes to school?

◣ Student enrollment and attendance patterns vary considerably across the states. There is a strong relationship between children's attendance and learning levels, particularly for children in Std 4.

◣ On average, 78% of appointed teachers were marked present in school registers across the three visits to each school.

◣ Having more teachers present does not necessarily improve learning outcomes. While schools with no teacher or one teacher did have lower average classroom scores, in schools that had more than two teachers present, there was no clear relationship between the number of teachers and average classroom score.

How is time organized?

◣ Just over half the schools had a time table displayed in the school. Out of these, more than 75% appeared to be following the timetable. Children in schools that had and followed a timetable had better learning outcomes than children in schools where there was no timetable or it was not being followed.

What facilities are available?

◣ Most schools meet RTE norms for teacher to classroom ratio, have a drinking water facility, at least one toilet and a collection of library books other than textbooks. However, fewer have a separate girls' toilet available. Even less have an unlocked girls' toilet.

◣ However, no clear relationship was found between specific facilities and children's learning, other than the availability and utilization of library books.

Introduction

Like most other schools in the world, primary schools in India work on certain key assumptions. It is assumed that children are enrolled in school at the age of five or six, depending on the official norms of the state. The school is organized in terms of classes which go from Std 1 to Std 4 or 5. It is assumed that most children and most teachers come to school regularly. Children are grouped broadly into age-grade specific classes and teachers are assigned to teach each class. There are timetables, textbooks and supplementary teaching learning materials. And all of this activity takes place within a physical space with certain infrastructural characteristics, such as a boundary wall, classrooms, toilets, and drinking water. These are the assumptions on which the school system is built.

How far are these assumptions true for the primary schools in the five states covered in this study? In any school, the actual business of teaching and learning happens in the classroom. But clearly, classrooms do not operate independently; their dynamics are influenced, at least in part, by decisions taken in the broader context of a school. Thus, school infrastructure and functioning directly influences, enables or constrains what is possible in a classroom.

In this section we explore a set of interconnected questions having to do with the organization and use of time, space and people in primary schools and relate these data to children's learning outcomes.

- *Availability of people.* Regardless of the nature of the curriculum and the textbooks, both teachers and students need to be present in school so that the required content can be transacted. In India, teacher absenteeism and child absenteeism are both topics that have received scrutiny in the last few years.[1] While enrollment rates are high, attendance patterns of teachers and children vary considerably across the country.[2] In schools sampled for this study, who comes to school and how frequently? And how do children's and teachers' attendance correlate with children's learning?

- *Organization of time.* Most schools are governed by the notion of a time table. The assumption is that school begins and ends at a certain time each day. The time in between is divided into "periods" of teaching with breaks for snacks, lunch and play. How do schools in our study organize their time? And do children in schools where time is structured according to curriculum requirements learn better than children in schools where this is not the case?

- *Availability of facilities.* Under SSA, commendable progress has been made over the last few years in providing basic infrastructure such as classrooms, water, toilets and boundary walls to all schools. The Right of Children to Free and Compulsory Education Act (2009) requires that all schools meet specified minimum infrastructural provisions. To what extent do the schools in our sample meet these requirements, and how do these relate to children's attendance and learning?

How often are children in school?

This study utilized several different indicators of student attendance. Attendance information was collected during three visits to each sampled school:

- *Attendance register.* how many children in each grade were marked present today?

- *Attendance register.* how many children in each grade were marked present yesterday?

- *Head count.* how many children were physically present in each grade during the visit?

---

1   The study by Kremer et al. (2004) brought the issue of teacher absenteeism into sharp focus. Since then there have been a number of other studies looking at this issue. In 2007, the Government of India commissioned a study to investigate patterns of student absenteeism across states. Also see SSA commissioned report on *Teachers' Absence in Primary and Upper Primary Schools 2009* at (http://ssa.nic.in/page_portletlinks?foldername= research-studies).

2   See ASER 2005, 2007, 2009 and 2010 data for state level estimates of attendance (teachers and children) on a given random day visit to a school. Also see SSA commissioned study on student attendance at http://ssa.nic.in/page_portletlinks?foldername=research-studies.

Enrollment and attendance: overall patterns

Across the 900 schools sampled for the study, overall attendance trends show that about 65% of all children enrolled in Std 1–5 were attending during any given visit **(Chart 3.1)**. Attendance figures from the school register match fairly closely with those obtained by a physical headcount of children. However, regardless of the state, school, or day of the visit, school registers invariably show that more children attended school yesterday than are present today. This difference (of 3–4 percentage points in every visit) suggests that attendance records are adjusted upwards at the end of each school day.[3]

Within primary schools, enrollment is highest in Std 1 and declines steadily till Std 5. The average number of students attending, on the other hand, drops sharply from Std 1 to Std 2 but remains almost constant thereafter. As a result, attendance as a percentage of enrollment increases steadily from Std 1 to Std 5. An illustration of this from Visit 1 is provided in **Table 3.1**.

Enrollment and attendance patterns vary substantially across the states in the sample. During Visit 1, for example, in Himachal Pradesh about equal numbers of children were enrolled in every grade; attendance was above 80% for every class and varied only slightly across grades. By contrast, in Rajasthan 40% fewer children were enrolled in Stds 4 and 5 than in Std 1, suggesting that large numbers of children change schools or drop out in the intervening period. However, mean attendance increased from 66% in Std 1 to 80% in Std 5, indicating that those who persist in school do attend regularly **(Table 3.2)**.

Attendance of sampled children

In addition to overall attendance patterns, each of the 30,000 Std 2 and Std 4 children who were randomly sampled from school enrollment registers was individually tracked across three visits to the school; thus any individual child could have been present 0, 1, 2 or 3 times. This provides an estimate of individual children's actual presence in the school that is more reliable than aggregate attendance data.

If we assume that "regular attendance" covers children who were present on at least 2 out of the 3 visits, we find that close to 75% of all sampled children did in fact attend school regularly during the period of this study **(Table 3.3)**. Over 40% of

Chart 3.1
Std 1–5 attendance across visits (%)

Legend:
- Attendance YESTERDAY (from register)
- Attendance TODAY (from register)
- Attendance TODAY (by headcount)
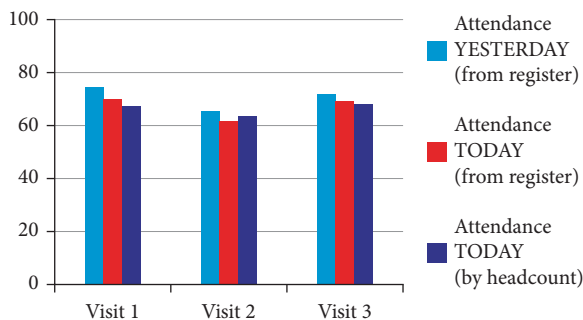
Table 3.1
Primary school attendance by grade (visit 1)

Primary schools (Std 1–5)	Visit 1				
	Std 1	Std 2	Std 3	Std 4	Std 5
Average enrollment (from register)	28.8	23.6	22.6	21.0	19.6
Average attendance TODAY (from register)	17.1	14.7	14.5	14.0	14.0
% attending TODAY (from register)	59.3%	62.1%	64.0%	66.8%	71.5%
% attending TODAY (headcount)	56.0%	59.8%	61.3%	65.5%	69.0%

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3   The same finding was obtained in the SchoolTELLS study which surveyed 160 schools in Uttar Pradesh and Bihar in 2007–08.

Table 3.2

Average enrollment and % attendance by grade: Himachal Pradesh and Rajasthan

Visit 1	Himachal Pradesh					Rajasthan				
	Std1	Std2	Std3	Std4	Std5	Std1	Std2	Std3	Std4	Std5
Average enrollment (from register)	12.8	12.8	13.2	14.1	14.2	30.4	24.6	22.0	18.4	18.7
% attending TODAY (from register)	83.9%	83.0%	84.5%	86.3%	87.8%	65.9%	68.7%	72.1%	76.9%	80.3%

Table 3.3

Attendance of sample children by state (%)

State	Attendance of sample children: Std 2					Attendance of sample children: Std 4				
	Not present in any visit	Present in one visit	Present in two visits	Present in all 3 visits	Total	Not present in any visit	Present in one visit	Present in two visits	Present in all 3 visits	Total
AP	1.1	7.5	28.1	63.3	100	0.5	3.6	27.0	68.9	100
AS	11.9	36.1	33.2	18.8	100			*		
HP	0.6	5.0	25.6	68.8	100	0.1	5.4	25.9	68.6	100
JH	8.1	28.1	38.6	25.3	100	6.4	27.1	38.0	28.5	100
RJ	3.1	15.6	37.6	43.7	100	1.3	11.0	35.2	52.5	100
Total	**5.4**	**19.7**	**33.4**	**41.5**	**100**	**2.3**	**12.7**	**31.9**	**53.1**	**100**

* Because primary schools in Assam go from Std 1 to Std 4, during the third visit for this study children from our Std 4 sample had left the school. Percentages for Std 4 in this table therefore exclude Assam.

Std 2 children and over 50% of Std 4 children were present on all three visits. More heartening is the fact that only 5 out of every 100 children in Std 2 were not present even once; this figure decreases to 2 out of every 100 children in Std 4. However, children's attendance patterns vary across the five states in the sample. Assam has a very large percentage of Std 2 children who were absent on all 3 visits. In Andhra Pradesh and Himachal Pradesh, on the other hand, over 90% of children in both grades were present on at least 2 visits.

Children's attendance and learning

Attendance matters. In both Std 2 and Std 4, mean and median test scores increase as children's attendance increases: that is, children who were found present in school more often did better than those who were found present less often, on both the baseline

and the endline tests (**Tables 3.4** and **3.5**). Further, children who attended on all three visits showed the largest percentage point increase between baseline and endline scores, indicating the largest amount of improvement over the school year.

Attendance is more critical in higher grades than in lower ones. In Std 2, baseline scores were higher among children who attended more often, but all children improved their scores from baseline to endline by roughly the same proportion, regardless of how often they were found present. In Std 4, on the other hand, the improvement in learning outcomes over the course of a year is clearly related to how often children were present in school. Children who were absent on all three visits actually did worse in the endline than in the baseline; those present on one visit did about the same on both tests; those present on two visits did somewhat better and those present on

Table 3.4

Std 2: Attendance and learning outcomes

No. of visits when child was present	Baseline score (%)		Endline score (%)		Difference	
	Mean	Median	Mean	Median	Mean	Median
0	35.0	36.0	46.7	51.0	11.7	15.0
1	38.1	38.0	48.5	51.0	10.4	13.0
2	40.1	40.0	51.6	55.0	11.5	15.0
3	45.5	47.0	59.7	66.0	14.2	19.0

Table 3.5

Std 4: Attendance and learning outcomes

No. of visits when child was present	Baseline score (%)		Endline score (%)		Difference	
	Mean	Median	Mean	Median	Mean	Median
0	35.8	36.0	31.8	30.0	-4.0	-6.0
1	34.3	33.0	35.0	33.0	0.7	0.0
2	37.0	36.0	42.7	42.0	5.7	6.0
3	42.9	42.0	51.0	52.0	8.1	10.0

all three visits did substantially better on the endline than on the baseline test.

How often are teachers in school?

Teacher appointment and attendance

During Visit 1 of fieldwork for this study (Sep–Nov 2009), sampled schools reported a total of 3,389 teachers– an average of almost 4 teachers per school. During Visit 3, roughly one year later, this number was 3,085. "Teachers" in this context includes all possible adults who had or could have a teaching role in the school: head teachers, regular teachers, contract teachers, and other teachers (such as community volunteers).

Both the total number of teachers and the average number of teachers in each type of post varies considerably by state (**Table 3.6**). For example, schools in Rajasthan and Jharkhand had the highest number of teachers overall, but whereas in Rajasthan these were mainly regular teachers, in Jharkhand they were primarily para teachers. In Assam, Andhra Pradesh

Table 3.6

Average number of teachers appointed per school, by teacher type and state

State	Visit 1					Visit 3				
	Head	Regular	Para	Other	Total	Head	Regular	Para	Other	Total
AP	1.0	2.2	0.7	0.1	3.9	1.0	2.1	0.7	0.2	3.8
AS	1.0	1.6	0.2	0.6	3.2	1.1	2.0	0.4	0.4	2.5
HP	0.6	2.2	0.3	0.1	3.3	0.6	2.2	0.4	0.0	3.2
JH	0.6	1.3	2.4	0.1	4.3	0.3	1.6	2.3	0.2	4.0
RJ	0.9	3.1	0.2	0.2	4.3	1.0	2.9	0.4	0.1	3.9
Total	**0.8**	**2.1**	**0.8**	**0.2**	**3.8**	**0.8**	**2.2**	**0.9**	**0.1**	**3.4**

and Rajasthan, virtually every school had a head teacher appointed, unlike in Himachal Pradesh and Jharkhand.

How often do these adults attend school? **Chart 3.2** shows the average number of teachers appointed and present in each school during the first round of fieldwork. **Chart 3.3** shows the percentage of teachers present during the first and second school visits. On average, across three visits 78% of all teachers were marked present in school on the day of the visit. This figure is fairly close to the estimates of teacher absenteeism across the country obtained in 2004 by Kremer, Muralidharan et al and to figures found in the study on teachers' absence commissioned by SSA (2009), and amounts to an average of 2.6 teachers actually present in any given school on the day of the visit. Further, teacher attendance improved between Visit 1 and Visit 3 in all states except Jharkhand.

However, these overall figures vary substantially depending on the measurement used and the place and time it was done:

- Teacher attendance varies depending on *how it is measured*. During the endline visit in Jharkhand and Rajasthan, for example, substantially more teachers were marked present in school registers than were physically observed in school. In Assam, by contrast, more teachers were observed present than were marked in the school register. In Andhra Pradesh and Himachal Pradesh these two measures of attendance are quite close, although in both states there were more teachers marked present than were physically observed.

- Teacher attendance varies considerably *across states*. Overall, attendance was higher during the endline visit (78%) than during the baseline visit (71%). During the baseline visit the percentage of teachers marked present on the day of the visit ranged 62% in Assam to 80% in Rajasthan; during the endline visit these percentages varied from 71% in Jharkhand to 85% in Andhra Pradesh.

- Related to the above, teacher attendance also varies enormously depending on the specific *time of year* and calendar within each state, for a variety of reasons both official and unofficial. During Visit 2, for example, all women teachers in one district in Himachal Pradesh were required to attend a sports tournament lasting two weeks; as a result, the number of teachers in school was much lower than usual. During Visit 3, two districts in Assam suffered severe floods; as a result teacher attendance during this visit was lower than during other visits.

- Teacher attendance appears to vary by *teacher type*. For a number of reasons, para teachers are thought to be more regular in attendance than regular teachers: they are hired on annual contracts; they typically live in the same community where the school is located; and they

Chart 3.2
Average number of teachers appointed and attending, by state (visit 1)
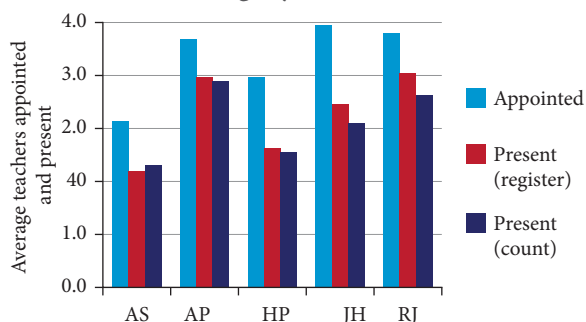
Chart 3.3
Average teacher attendance by state (%)
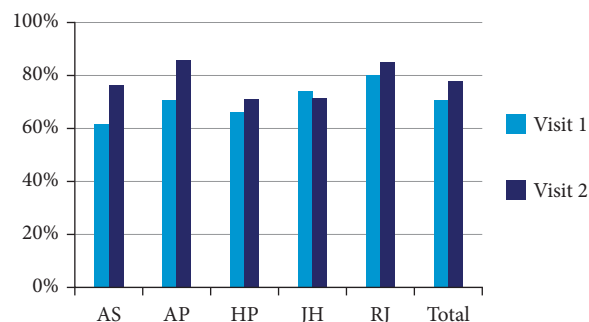
Table 3.7
Teacher attendance: regular vs contract teachers (%)

State	Visit 1		Visit 3	
	Regular	Para	Regular	Para
AS	66.8	66.7	23.3	60.0
AP	63.1	86.5	82.2	90.6
HP	66.9	70.0	76.7	74.4
JH	66.6	77.9	74.4	69.9
RJ	82.2	84.6	62.9	84.7
Total	**69.3**	**77.5**	**70.2**	**76.9**

have fewer non teaching responsibilities than their counterparts who are regular government teachers. The data from this study confirm this pattern **(Table 3.7)**. Overall, 69% of all regular teachers were present during Visit 1 as opposed to 78% of all para teachers; similar proportions are found during Visit 3.

Teachers' attendance and children's learning

A common assumption is that primary schools in India are seriously understaffed and that having more teachers per school is needed to improve the quality of teaching and learning. **Table 3.8** shows the mean and median classroom scores on the baseline and endline tests, by the number of teachers marked present in the school (averaged across the 3 visits). These data show that schools with an average of 0 or 1 teacher present clearly have lower mean and median classroom scores

than schools with an average of 2 or more teachers, on both the baseline and the endline tests. But beyond 2 teachers, there is no clear relationship between the average number of teachers present and classroom scores, on either baseline or endline. Evidently, it is not simply a matter of having more adults present in the school that helps children learn better, but what these adults do in the classroom. This is the subject of the next chapter.

Organization of time

As an indicator of the extent to which schools explicitly provide a structure which organizes working hours around children's learning, field investigators were asked to observe whether each sampled school had a timetable displayed in a public space (classroom, corridor, head teacher's office for example); and if so, whether the observed Std 2 and Std 4 classes were following the timetable during the observation.

Overall, just over half of all schools had a time table displayed somewhere in the school; this proportion is much higher in Andhra Pradesh than in the other four states. Of the approximately 500 schools that did have such a time table, more than three quarters were observed to be following it during the classroom observation **(Table 3.9)**.

Having a timetable displayed in the school or classroom is associated with better learning outcomes **(Table 3.10** and **3.11)**. Out of the schools that had a

Table 3.8
Teachers' attendance and classroom scores: Std 2 and Std 4

Average teachers present over 3 visits (register)	Std 2 classroom score (%)				Std 4 classroom score (%)			
	Baseline		Endline		Baseline		Endline	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median
0	34.2	36.0	46.6	47.5	30.4	29.5	36.7	36.0
1	41.2	42.0	54.0	54.0	36.5	35.0	45.9	43.0
2	46.1	45.0	58.7	61.0	41.6	40.0	50.4	49.0
3	43.0	45.0	55.6	59.0	38.2	36.0	46.8	46.0
4	41.7	42.0	55.6	57.0	38.1	38.0	47.2	44.0
5+	42.8	44.0	54.0	54.0	41.6	41.5	46.6	43.0
Total	**42.9**	**43.0**	**55.5**	**57.0**	**38.8**	**37.0**	**47.2**	**46.0**

Table 3.9

Timetable availability and utilization (%)

State	% schools with time table			Of schools that had time table, % that followed it		
	With time table	Without time table	Total	Followed time table	Did not follow time table	Total
AP	79.1	20.9	100.0	80.7	19.3	100
AS	54.7	45.4	100.0	72.9	27.1	100
HP	43.0	57.0	100.0	76.1	23.9	100
JH	42.9	57.1	100.0	65.5	34.5	100
RJ	56.8	43.2	100.0	82.5	17.5	100
Total	**55.3**	**44.7**	**100.0**	**77.2**	**22.8**	**100**

Table 3.10

Distribution of mean classroom scores by availability of timetables: Std 2

		Mean Std 2 classroom score				
		0–20%	21–40%	41–60%	>60%	Total
ALL SCHOOLS		14.2	31.2	36.9	17.8	100
Timetable observed in the school?	Yes	10.3	27.9	41.1	20.7	100
	No	19.3	35.0	32.0	13.7	100
If yes, was it being followed?	Yes	7.4	22.7	38.9	31.0	100
	No	11.7	28.3	48.3	11.7	100

Table 3.11

Distribution of mean classroom scores by availability of timetables: Std 4

		Mean Std 4 classroom score				
		0–20%	21–40%	41–60%	>60%	Total
ALL SCHOOLS		12.7	45.0	30.2	12.1	100
Timetable observed in the school?	Yes	8.8	44.6	31.6	15.0	100
	No	17.3	45.7	28.7	8.4	100
If yes, was it being followed?	Yes	3.9	35.5	38.9	21.7	100
	No	6.7	51.7	28.3	13.3	100

timetable, more than 20% obtained average Std 2 scores in the top two quintiles while for schools without a time table, scores in this range were found in about 13% of schools. Similarly, the proportion of schools without a time table that had mean Std 2 classroom scores of below 20% was nearly double that of schools with a time table that had scores in this category.

There is also a difference in learning outcomes between schools which had a timetable that was actually being followed and schools where a timetable was available but not being followed. Out of the schools that appeared to follow a timetable, 3 out of every 10 Std 2 classrooms scored in the top 2 quintiles while less than 10% scored in the lowest quintile. In contrast, in schools where a timetable was present but not being followed, not even 1 out of every 10 scored in the top two quintiles while more than 10% scored in the lowest quintile. These results suggest that school organization does play an influential role in affecting learning outcomes among children.

School facilities

Finally, we address the question of the basic facilities available in schools and analyze the relationship between the presence of facilities and children's attendance and learning. Data was collected on a number of indicators related to the facilities available in sampled schools, such as classrooms, boundary walls, water and toilet provision, and libraries, all of which are now included as required infrastructure specified in the Right to Education Act. In addition, in schools which had a collection of books other than textbooks, field investigators were asked to observe whether children were using them.

School facilities and children's learning

Table 3.12 presents selected indicators of school infrastructure, the percentage of schools where these indicators were observed, and the median scores of children in schools with and without the indicator. In terms of compliance with RTE norms, the table shows that about 75% of schools comply with the norms for classroom:teacher ratio and the same proportion have a drinking water facility, whether usable or not. About two thirds of these schools have at least one toilet (whether usable or otherwise) as well as a collection of library books (defined here as a collection of books other than textbooks). Less than half had a separate girls' toilet and of those that did, only about half were found unlocked.

In general, no clear relationship is observed between specific infrastructural provisions and children's learning. For example, children in schools with a boundary wall appear to learn as much during one year as their counterparts in schools without a boundary wall. The availability of an *unlocked girls'* toilet appears to increase the median baseline and endline scores substantially, but children in these schools learn as much over a period of one year as children in schools where a girls' toilet is not available.

Table 3.12
School facilities and median test scores: Std 2 and Std 4

| Indicator | Categories | % of all schools | Median test scores (%) – all students | | | | | |
| | | | Std 2 | | | Std 4 | | |
			Baseline	Endline	Diff	Baseline	Endline	Diff
1 classroom per teacher	Yes	77.0	41	54	13	35	43	8
	No	23.0	42	56	14	37	44	8
Toilet	Not available	34.2	39	51	12	37	44	7
	Available, not usable	18.6	41	58	17	34	46	12
	Available and usable	47.3	42	56	14	36	43	7
Girls' toilet	Not available	54.6	39	53	14	36	44	8
	Available, locked	21.2	40	54	14	35	43.5	8.5
	Available, unlocked	24.1	45	57	12	38	46	8
Boundary wall	Yes	26.9	42	57	15	38	47	9
	No	73.1	41	55	14	35	43	8
Drinking water	Not available	23.4	40	57	17	36	47	11
	Available, not usable	7.7	48	63	15	38	49	11
	Available and usable	68.9	40	53	13	36	43	7
Library books	Not available	32.0	36	49	13	29	39	10
	Available, not in use	44.5	42	53	11	37	43	6
	Available and in use	23.5	47	61	14	43	55	12

The clearest relationship between inputs and outcomes can be seen in the case of the availability and utilization of library books. Across the three categories of schools (those without such books available, those with library books available but where students were not observed using them, and those where library books were available and students were observed using them) there is a steady improvement in both baseline and endline scores in both Std 2 and Std 4. Once again, however, the gain in learning over a year (as measured by the difference between endline and baseline scores) shows no clear pattern across these three categories.

Implications of these findings

The close tracking of schools over time provides some insights about how schools actually function, and allows us to compare usual assumptions about how schools operate with the reality visible on the ground. For example, across the five states, average enrollment figures indicate that there are less than 30 children enrolled in each grade. With attendance hovering between 60 and 70%, this means that there are often less than 20 children present in a grade. Data in the next chapter suggest that other than in Jharkhand, less than 10% of all sampled schools have more than 40 children in any grade, whereas well over 70% of grades have less than 30 children. Thus the usual image of overcrowded government schools is certainly not borne out in the schools in the study.

The analysis in this chapter points to some clear and simple ways of how school functioning can influence children's learning. If teachers and children attend regularly the probability that some teaching-learning will occur is much higher than when absenteeism is widespread. While the issue of teacher absenteeism has received a lot of attention in both academic research and policy circles, the obvious problem of *children* not attending regularly has not been at the forefront of our thinking on how to improve schools.

The assumption is that a specific teacher(s) teaches a group of children; they work together through the year on a daily basis so that children learn. Usually they use the textbook as an anchor for teaching-learning activities. A further assumption is that this group of teacher and students is a stable one. However, the reality in the schools in this study is quite different. Although with the existing data we are not able to establish whether the same teacher teaches the same group of children through the year, we can see that the composition of the group of children changes over time. On average 40–50% children are always there (we find them on each of our three visits) but the remainder are sometimes there and sometimes not. While about half the children have the opportunity to make steady progress if the teacher is regular, it is difficult to have the other half stay on track. The regularity and stability of attendance is essential for effective teaching and learning.

Some recent research on India has focused on how time is organized and used in classrooms. But there is much less available in the literature of how time is organized in the school: how the day is supposed to be spent and how it actually does get spent. This study uses a simple indicator – the timetable. The assumption behind a time table is that the day is divided into different portions and each portion is assigned to a set of tasks. Given the resources of the school (teachers, children and classrooms) the timetable optimally allocates time, people and space to carry out the activities that are needed. Time planning is the first building block of effective use of time. Almost half the schools visited in the study did not have a timetable and of those that did about a quarter did not follow it. The results are not surprising: schools where time was planned better seemed to produce better student learning.

Finally, the data in this chapter indicate that infrastructural provisions do not seem to be closely correlated with children's learning outcomes. Given the recently implemented Right to Education Act, it is important for policymakers, practitioners and parents to remember that good inputs in terms of facilities do not guarantee "education". For effective teaching and satisfactory learning it is how these resources are used that makes a difference.

INSIDE THE CLASSROOM |4

Summary

This chapter analyses 850 hours of classroom observation to examine broad patterns in classroom environment, organization and activities and how these relate to children's learning outcomes.

Classroom environment and organization

▴ Most classes took place in a classroom. Although most classrooms had basic facilities such as blackboards, few had children's work displayed.

▴ Most classrooms had well under 30 students present in all. However, these usually comprised two or more grades sitting together.

▴ In almost all classrooms, children sat in rows facing the teacher. Although where each child sat (front row, back row, other) tended to vary across the year, girls and children in the General social category were more likely to be found sitting in the front row. Children sitting in the front row had higher test scores on average than those sitting elsewhere.

Teaching methods

▴ The most frequently observed teaching methods were writing on the blackboard (63% of all classrooms) and reading from the textbook (61%). In contrast, teachers were observed using teaching learning material other than the textbook in barely 10% of all classrooms.

▴ Even though most classrooms comprised children from different grades, there was little evidence of teaching methods that catered to the diverse needs or abilities of students.

Child friendly classrooms

▴ Six simple indicators were used to identify 'child friendly' classrooms. Overall, three or more child friendly practices were seen in less than 20% of the 1,706 observed classrooms. More than half of these were located in a single state: Andhra Pradesh.

▴ There is a clear correlation between 'child friendly' classrooms and students' learning. These data suggest that there are simple ways of making children feel welcome and valued in the school that can have a positive impact on basic learning outcomes.

Introduction

In Chapter 2 we reviewed the content that children are expected to master in Std 2 and 4, as reflected in language and math textbooks, and the distance between those expectations and what children in these classes can actually do. The analysis showed that although curriculum expectations of what children should learn vary across the states in our sample, the learning goals –where these are specified in the textbooks – are consistently at a level that is completely beyond the reach of most children.

This chapter examines *how* curriculum content is actually transacted in the classroom. Major policy documents such as the National Curriculum Framework (2005) and the National Curriculum Framework for Teacher Education (2009) emphasize the fact that learning outcomes depend fundamentally on what happens inside the classroom. But because documentation and analysis of classroom transactions is a complex task, these tend to be the domain of small-scale qualitative studies. As a result, little data is available on the extent to which Indian classrooms conform to the goals and expectations set out in policy documents.

As part of this study, a thirty minute classroom observation was conducted during the baseline field visit in more than 1,700 Std 2 and Std 4 classrooms from which students were randomly selected for the study. The tool consisted of a series of simple, easily observable characteristics or activities grouped into four major categories: classroom environment, teacher attitude, teaching methods, and student activities. No attempt was made to record the time spent on individual classroom activities; instead, field investigators were asked to record whether or not they observed each specified activity or behaviour even once during the course of a thirty minute observation. These data therefore provide a broad overview, rather than a detailed picture, of the physical environment in which classes take place and of the activities taking place in the observed classrooms.

This chapter summarizes some major findings from the classroom observation and how these relate to children's learning outcomes as measured in the baseline test. The data reported here are based on observations in 1,706 Std 2 and Std 4 classrooms located in 900 rural primary schools spread over 5 states – a total of over 850 hours of observation. The discussion centres on three aspects of classrooms: the physical environment; the participants – students and teachers; and teaching methods.

The physical space

Seventy students of Std 1 and 2 sit in horizontal rows, closely packed into a large, airy and well lit room. They sit cross-legged on the floor, some on plastic gunny bags and tattered durries. Perhaps six inches of space separate one row of children from the next. Boys and girls are interspersed, as are Std 1 and 2 students. Two or three very small children – evidently younger siblings of others in the class – sit at the very back, against the wall. The strip of empty floor space in front, along the blackboard, is too narrow for a teacher to walk the entire width of the room, but the space along one side does allow access all the way down its length. This means that the teacher can physically approach only those children sitting along one side of the classroom and some of those sitting in the front row; the rest are packed together too closely to be accessible.

There is no desk for the teacher, nor space for one. The single chair is positioned in one corner of the room, close to the door. A long, low table runs along the front of the class, near the blackboard, on which children in the front row place their textbooks and notebooks. All other children hold their textbooks and notebooks or slates in their lap, often on top of their school bag. There is no furniture in the room other than the teacher's chair. The classroom is completely bare, with no charts on the walls or TLM in any form. The large blackboard is in good condition and has today's date neatly inscribed on it. Below the date there are three columns of information: one contains letters, one contains 'bina matra ke shabd', and one has numbers from 1 to 50. [Field notes, Rajasthan, November 2009]

Table 4.1

Table 4.1
Classroom environment indicators, by state (%)

State	Blackboard available?		Children's work displayed?		TLM other than textbooks visible?	
	Std 2	Std 4	Std 2	Std 4	Std 2	Std 4
AP	96.6	98.8	38.3	45.5	43.4	41.7
AS	97.6	99.4	39.8	43.0	30.5	28.5
HP	86.4	85.0	23.3	24.0	34.7	36.6
JH	89.4	91.1	9.5	6.0	13.3	9.6
RJ	95.8	95.2	16.8	21.6	25.3	26.1
Total	**93.1**	**93.8**	**25.6**	**27.8**	**29.7**	**28.6**

▰ *Classroom environment* indicators aimed to assess the immediate context in which the class was taking place. For example, was the class held in a room? Was there a blackboard that was visible from the back of the class? Was any teaching-learning material other than the textbook visible in the classroom? Who was present, and how was the physical space organized to accommodate them?

Testimony to the emphasis on providing adequate classroom and other facilities in recent years, about 85% of the 1,706 observed Std 2 and Std 4 classes took place in a room.

Classrooms, however, were typically not inviting places for children. Although almost all classrooms had a blackboard available which was both usable and visible from the back of the class, less a third of classrooms had either children's own work displayed or any teaching-learning material intended for children's use – defined here as any material other than the textbook that children could handle and/or manipulate.[1] There is considerable variation in these indicators across states (**Table 4.1**).

The participants

Teacher: Field investigators were specifically asked to observe a class where a teacher was teaching, wherever possible; therefore most classrooms in this sample were marked as having a teacher present during the observation. But despite the presence of an external observer, just over three quarters of all classrooms had teachers who were physically present throughout the 30-minute observation (**Table 4.2**). A more general analysis of how often teachers are present in school and the relationship between teacher attendance and student learning is included in Chapter 5 on teachers and teaching.

Students: The majority of schools in this sample were in small and often fairly remote rural locations with low total enrollments and an average of two teachers. Therefore, although most classrooms had relatively few students in all, these usually comprised children from at least two grades sitting together.

Overall, more than half of all classrooms had fewer than 20 students physically present at the time of the observation (**Table 4.3**). However, two out of every three were multigrade classrooms. Both in Std 2 and Std 4, the most common pattern was to find two grades sitting together in the same classroom, but a fairly large proportion had three or more grades sitting together, especially in Std 2 (**Table 4.4**). This has important implications in terms of the demands on teachers, who routinely deal with groups that although small in number, vary in terms of age, ability, and curriculum requirements.[2]

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1   This definition excludes charts and posters displayed on the wall, such as alphabet charts or multiplication tables.
2   The Right of Children to Free and Compulsory Education Act (2009) specifies that every school must have one classroom per teacher, at least two teachers, and (for schools with a total primary enrollment of more than 60 students) one teacher for every 30 students. No norms are specified with respect to multigrade classrooms.

Table 4.2
Teacher presence during the classroom observation, by state (%)

State	Std 2				Std 4			
	All of the time	Some of the time	No	Total	All of the time	Some of the time	No	Total
AP	87.4	12.0	0.6	100	90.1	9.9	0.0	100
AS	76.8	21.4	1.8	100	78.5	19.0	2.5	100
HP	68.8	21.0	10.2	100	69.0	17.2	13.8	100
JH	66.1	24.9	9.1	100	64.7	28.1	7.2	100
RJ	84.2	14.0	1.8	100	87.7	9.3	3.1	100
Total	**76.7**	**18.6**	**4.7**	**100**	**77.9**	**16.7**	**5.4**	**100**

Table 4.3
Average number of students present in the classroom, by state (%)

State	Classrooms where Std 2 was sitting						Classrooms where Std 4 was sitting					
	<10	11–20	21–30	31–40	41+	Total	<10	11–20	21–30	31–40	41+	Total
AP	25.9	37.0	22.8	9.9	4.3	100	29.2	32.5	23.4	10.4	4.6	100
AS	34.0	34.0	17.0	5.2	9.8	100	39.2	31.5	16.1	4.9	8.4	100
HP	27.7	42.8	21.7	4.8	3.0	100	29.8	47.0	13.7	6.0	3.6	100
JH	5.5	17.7	22.6	18.9	35.4	100	9.2	22.0	24.4	18.9	25.6	100
RJ	16.1	33.3	24.7	14.8	11.1	100	29.1	40.6	15.8	6.7	7.9	100
Total	**21.7**	**33.0**	**21.8**	**10.8**	**12.8**	**100**	**27.0**	**34.9**	**18.6**	**9.5**	**10.1**	**100**

Table 4.4
Grouping of students within classrooms, by state (%)

State	Classrooms where Std 2 was sitting				Classrooms where Std 4 was sitting			
	Single grade	2 grades together	3+ grades together	Total	Single grade	2 grades together	3+ grades together	Total
AP	29.1	43.7	27.2	100	40.8	40.8	18.5	100
AS	54.2	38.0	7.8	100	55.7	34.4	9.9	100
HP	35.0	36.9	28.1	100	40.0	51.9	8.1	100
JH	5.5	46.6	47.9	100	6.9	50.3	42.8	100
RJ	21.1	48.9	30.1	100	30.5	50.0	19.5	100
Total	**29.1**	**42.6**	**28.3**	**100**	**34.7**	**45.6**	**19.7**	**100**

Table 4.5

Table 4.5

Seating patterns in the classroom, by state (%)

State	Classrooms where Std 2 was sitting					Classrooms where Std 4 was sitting				
	Rows	Circle	Small groups	Other	Total	Rows	Circle	Small groups	Other	Total
AP	93.7	4.6	1.7	0.0	100	93.0	4.1	2.9	0.0	100
AS	95.2	1.8	2.4	0.6	100	97.5	0.6	1.9	0.0	100
HP	96.6	1.1	2.3	0.0	100	98.8	0.0	1.2	0.0	100
JH	87.6	0.6	6.5	5.3	100	88.7	3.6	6.6	1.2	100
RJ	95.7	1.2	3.1	0.0	100	96.4	0.0	1.8	1.8	100
Total	**93.8**	**1.9**	**3.2**	**1.2**	**100**	**94.9**	**1.7**	**2.9**	**0.6**	**100**

Table 4.6

Stability in seating patterns among students present on all 3 visits: Std 2 and 4

Seating Pattern	Seated in front row on all 3 visits	Seated in back row on all 3 visits	Seating mixed across visits	All students present on all 3 visits
N	1,300	599	7,864	9,703
%	13.4	6.3	80.6	100

Organization of space

The way in which available resources are organized can reveal a great deal about the extent to which children's learning is the main focus within the classroom. For example, did children sit in ways that facilitated learning from each other as well as from the teacher? Did boys and girls sit separately? Was there a pattern to which students sat in the front row and which sat at the back of the class, and did these seating arrangements change over time?

In the observed classrooms, children were almost invariably seated in rows. If the group was small enough, they sometimes sat in a large "circle" around the walls of the room, with an empty space in the middle. Other types of seating arrangements such as small groups were almost never observed (**Table 4.5**). Girls and boys sat separately in many classrooms – much more often in Std 4 (59% of all classrooms) than in Std 2 (45% of all classrooms).

On each of the three visits to the school, if children in our sample were found present in school that day then where they were sitting in the classroom was recorded: front row, back row, or elsewhere. An analysis of these data reveals that seating patterns are not stable over time. Of the almost 10,000 sampled children who were present in school on all three visits, only 20% sat consistently in either the first row or the last row of the classroom. For the most part those who sat consistently in the same place were those in the front row (**Table 4.6**).

Who sits where in the classroom? An analysis of teachers' attitudes reveals that in theory, teachers believe that mixing weaker and stronger children is among the best ways to help children who are not learning as much or as fast as they should be. Of six possible strategies for dealing with academically weak children, 44% of the 1,630 teachers who responded to this question ranked this option as the one they most agreed with, implying that classroom seating and grouping patterns should be based on children's academic abilities and needs. The same proportion ranked the option "I spend extra time teaching the child before or after school" as option 1.

In practice, however, we saw in a previous section that children are very rarely seated in any configuration other than in straight lines. Further, the baseline and endline scores of those children who sat consistently

Table 4.7
Classrooms seating patterns and children's learning

Median total score (%)	Std 2			Std 4		
	Baseline	Endline	Difference	Baseline	Endline	Difference
Front row on all 3 visits	51	72	21	52	58	6
Back row on all 3 visits	49	68	19	42	52	10
All children present on all 3 visits	47	66	19	42	52	10

Table 4.8
Classrooms seating patterns and child characteristics

Characteristic (%)	Age			Social category				Gender	
	Younger	Right age	Older	General	SC	ST	OBC	Boys	Girls
Seating mixed across 3 visits	84.9	83.7	84.7	80.9	82.6	83.2	84.1	83.6	84.5
Students in front row on all 3 visits	9.1	11.6	10.2	14.6	12.0	11.0	11.0	10.5	11.6
Students in back row on all 3 visits	6.1	4.7	5.2	4.5	5.4	5.8	4.9	5.9	3.9
Total	100	100	100	100	100	100	100	100	100

either in the front or the back row suggest that the better-performing students sit in the front row. Even during the baseline visit, a few months into the school year, the median score of children who consistently sat at the back was lower than those who sat in the front of the class. The difference is small (2 percentage points) for Std 2, large (10 percentage points) for Std 4. Over the course of the year, the gap widened to 4 percentage points among Std 2 children and narrowed to 6 percentage points among Std 4 children.

By the end of the year, students sitting at the back of the class appear to know about as much or little as other children who attended regularly, whereas those sitting consistently in the front row continue to do slightly better than the others.

If learning needs are not the basis for classroom seating configurations, what factors are associated with who sits where in the classroom? The data suggest that the child's gender, age and social category are associated

with where he or she sits. Girls and children from the General social category are overrepresented among those who sat consistently in the front row, whereas boys and underage children are underrepresented among children in the front row (**Table 4.8**). By contrast, where children sat shows little relationship with the economic and educational characteristics of their households.

Teaching methods

Sunita ma'am asks the children if they want to listen to 'kawwe ki kahani'. The children chorus 'yes' in unison. She takes a textbook from a child close to where she is standing and begins reading the story of 'kawwe ki chaturai' in a sing song fashion. She punctuates her sentences with questions based on recall from a previous class rather than what she had just read, implying familiarity with the story. Sometimes she answers the question herself and has the children repeat the answer after her. Some children seem to be very familiar with the text, finish her sentences promptly, and chant 'ji' at end of every such response. At one point Sunita ma'am points to the illustration and asks 'yeh kya hai?' One girl answers her question incorrectly and is asked to stand up and hold her ears and apologize. 'Ab nahin bologi na?' says Sunita ma'am with a half smile. She ends the *story by asking all the children in the room what a crow sounds like. The children happily caw in a chorus.* [Field notes, Rajasthan, November 2009]

◢ *Teaching method* indicators collected data on the instructional methods utilized by the teacher during the observation. Field investigators were asked to identify those teaching-related activities that they saw the teacher do even once during a thirty minute period, regardless of whether that activity took three minutes or all thirty. Did the teacher read aloud from the textbook? Did she write on the blackboard? Did she use TLM other than the textbook? These indicators covered both those instructional strategies known to be commonly utilized in primary school classrooms, such as reading from the textbook and dictation, as well as those explicitly recommended by the National Curriculum Framework (2005), such as small group work and use of supplementary Teaching Learning Material (TLM).

Despite the fact that different field investigators observed the Std 2 and Std 4 classroom in each school, the results are strikingly similar across the two classes (**Table 4.9**).[3] Writing on the blackboard and reading

Table 4.9
Teaching activities in observed classrooms (%)

Teacher was observed	% classrooms	
	Std 2	Std 4
Writing on blackboard	67.2	69.0
Reading from textbook	63.8	66.9
Asking students to do any kind of written work	62.9	61.7
Asking students oral questions	57.4	58.3
Checking written work	51.0	48.2
Giving dictation	38.5	35.7
Asking students to recite, singly or all together	36.5	36.4
Asking students to write on blackboard	22.3	29.4
Asking students to work in groups	16.7	15.3
Asking students to use TLM other than textbook	14.0	12.2

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3   A team of two field investigators visited each school.

from the textbook were the most commonly observed teaching activities, whereas group work or use of teaching learning materials other than the textbook were rarely observed. Although children in each classroom were diverse at least in terms of belonging to different grades, the teaching methods and materials commonly employed assume a uniform group of students both in terms of grade and ability level.

'Child friendly' classrooms and learning

Sunita ma'am points to a girl near the front of the class and immediately shouts at her for removing her lunch bowl from her bag before time. She scolds the rest of the class for being noisy, pointing to the more talkative children with her stick, and then leaves the room. After a few minutes she re-enters and takes the slate from an outstretched arm in the first row. The student, a girl named Asha, is in Std 2 and had diligently copied down the numbers written on the board. The teacher scans her work and marks it with a tick. She then repeats the same process with the slates of a few more children in the first row. The rest of the children in the room carry on with what they were doing, oblivious to the teacher's presence; some copying down what was written on the board, some talking and some playing in small groups. [Field notes, Rajasthan, November 2009]

Although both the National Curriculum Framework (2005) and RTE (2009) stress the importance of child friendly learning environments in promoting children's retention and learning, neither document specifies how we might recognize a "child friendly" classroom when we see one.

In order to analyze the relationship between classroom practice and children's learning, six specific indicators of "child friendliness" within the classroom were identified from among classroom environment and teaching methods indicators described earlier. Individual classrooms were classified based on the presence or absence of these indicators, described below:

- *Did the teacher smile, laugh or joke with at least some students?*
- *Did students ask the teacher questions?*

The NCF states: "Children will learn only in an atmosphere where they feel they are valued... The association of learning with fear, discipline and stress, rather than enjoyment and satisfaction, is detrimental to learning." Both these indicators attempt to assess whether or not the classroom provided what the NCF refers to as a 'nurturing environment', defined as "one where children feel secure, where there is absence of fear, and which is governed by relationships of equality and equity."

- *Was children's work displayed in the classroom?*

One way to show children that they are valued is to appreciate their work. The NCF explicitly recommends that "Classrooms can be... made lively by displaying children's work on the classroom walls as well as in different parts of the school."

- *Did the teacher use local information to make academic content relevant?*

The NCF states: "The participation of the community in the child's world of education and learning should allow for the community to... [i]nfluence the content of subjects and add local, practical, and appropriate examples." The use of local information is especially important when dealing with younger children, especially in a context where many are first generation students.

- *Did the teacher use any TLM other than the textbook?*
- *Did the teacher ask children to work in small groups or pairs?*

The NCF states: "The pluralistic and diverse nature of Indian society definitely makes a strong case for preparing a variety of not only textbooks but also other materials, so as to promote children's creativity, participation and interest, thereby enhancing their learning. No one textbook can cater to the diverse needs of different groups of students." In earlier sections of this report we have seen that two thirds of the classrooms in our sample are multigrade classrooms. Both the use of supplementary TLM and small group work can be effective mechanisms to engage students from different classes and ability levels.

Teachers themselves appear to recognize the importance of child friendly classrooms for children's learning. In another question in the anonymous teaching questionnaire administered as part of this study, teachers were asked to rank a set of factors that they believed most influenced a child's learning inside the classroom. Teachers were asked to rate the options given on a scale of 1 to 5, with 1 representing the response they most agreed with and 5 the one they least agreed with.

From the options provided, 60% of teachers who responded to this question ranked the last option at 1, indicating that of the five options listed, having a friendly relationship with the teacher is the most important influence children's learning inside the classroom.

How child friendly are our classrooms?

The data compiled from 1,706 classrooms suggest that there is a considerable gap between what policy documents espouse and what teachers think on the one hand, and what actually happens in the classroom on the other. During the observations, 4 out of every 10 classrooms had zero of the six characteristics listed above and another four had one or two. By contrast, four or more of these child friendly practices were observed in less than 1 out of every 10 classrooms (**Table 4.10**).

None of the six child friendly practices included here was observed in more than 30% of the observed classrooms. The most commonly observed were *students asking the teacher questions* (28%) and *children's work displayed in the classroom* (26%). No attempt was made to evaluate the nature or frequency of the questions asked or the type of children's work on display. The indicators requiring alternative pedagogical strategies - use of supplementary teaching-learning materials, and small group work - were infrequently observed (**Chart 4.1**).

Individual states varied enormously with respect to the 'child friendliness' of primary school classrooms. As **Table 4.11** shows, 60% of all child friendly classrooms in the sample are located in just one of the five states included in this study: Andhra Pradesh. Classrooms where not a single one of these six practices was observed are spread across the other four states.

Table 4.10
Number of child friendly indicators in observed classrooms

No. of indicators observed	0	1	2	3	4	5	6	Total
No. of Std 2/4 classrooms	660	462	282	152	100	39	11	1,706
% of all classrooms	38.7	27.1	16.5	8.9	5.9	2.3	0.6	100

Frequency with which individual 'child friendly' indicators were observed (%)
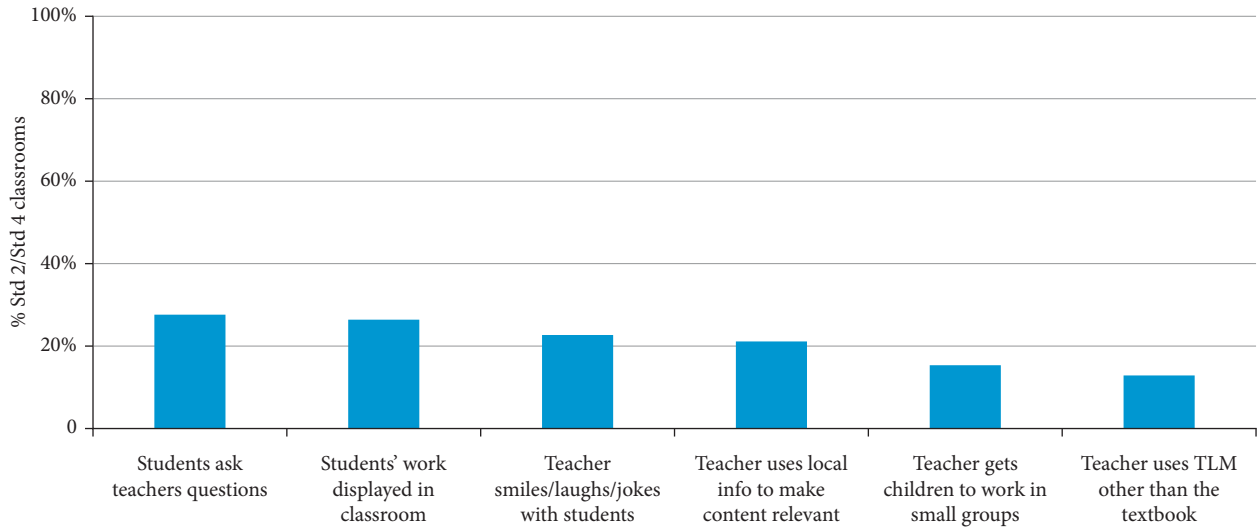
Table 4.11

Child friendly practices in observed classrooms, by state

Std 2/4 classrooms where 4–6 child friendly practices were observed			Std 2/4 classrooms where 0 child friendly practices were observed		
State	N	%	State	N	%
AP	91	60.7	AP	63	9.6
AS	15	10.0	AS	103	15.6
HP	20	13.3	HP	146	22.1
JH	2	1.3	JH	199	30.2
RJ	22	14.7	RJ	149	22.6
Total	**150**	**100**	**Total**	**660**	**100**
% of all classrooms:		8.8%	% of all classrooms:		38.7%

Is 'child friendliness' correlated with better learning?

Analysis of baseline test data for almost 29,000 students studying in the observed Std 2 and Std 4 classrooms indicates a strong relationship between child friendly classrooms and student learning outcomes, in both Std 2 and Std 4. In both sets of classrooms, the mean and median classroom test score increases steadily as the number of 'child friendly' indicators observed in the classroom increases. **Chart 4.2** shows this graphically for Std 4 classrooms.

The correlation between student learning and child friendly classrooms holds for each of the six indicators individually, but the strength of the relationship varies both across indicators and also across the two classes studied (**Tables 4.12, 4.13**). For example, the largest difference is seen in classrooms where the teacher was observed using any teaching learning material other than the textbook; this is true for both Std 2 and Std 4. Working in small groups, on the other hand, is strongly correlated with Std 4 learning outcomes but less so with Std 2 outcomes.

Distribution of mean classroom scores in classrooms with less and more child friendly practices (%)
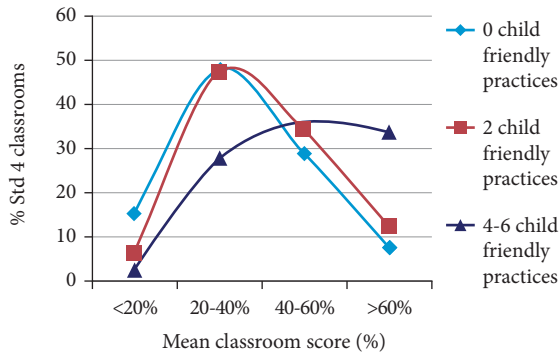
Implications of these findings

It is usually and rightly believed that meaningful classroom observations are hard to do and require sophisticated and skilled observers. This has been a major reason why there is so little research on classroom practice and even less empirical work that is done with a large sample of schools. One of the major contributions of this study has been to develop a basic set of indicators that are simple to use and yet can lead to understanding important elements of what goes on in the classroom.[4]

The evidence presented in this chapter suggests that policy documents are right to underline the importance of a range of 'child friendly' practices for children's learning outcomes. There appears to be a clear relationship between child friendly classrooms and learning outcomes both in Std 2 and in Std 4.

Evidence was also presented to show that teachers appear to know that 'child friendly' classrooms are important for children's learning. But there is no evidence that what policy documents say or even what teachers think is reflected in what teachers actually do in the classroom, whether in terms of the organization of space or actual teaching methods.

At the core of this contradiction, perhaps, is the fact teachers also espouse two very contradictory beliefs. On the one hand, out of all teachers who responded to a question which asked them to rank which specific group(s) of children found it most difficult to learn, about two thirds gave "children whose parents are illiterate" a rank of 1 – indicating their awareness of the fact that children whose parents have no schooling are disadvantaged relative to other children. Most of the remaining teachers felt that all children were the same and that no particular group of them had more difficulties than others.

Simultaneously, however, most teachers responded to a question regarding the reasons for poor learning outcomes by placing the responsibility squarely on the

Table 4.12

Child friendly indicators and test scores: Std 2

Classroom indicator	Std 2 classroom baseline score (%)					
	In classrooms where indicator = 'Yes'		In classrooms where indicator = 'No'		Difference ('Yes' – 'No')	
	Mean	Median	Mean	Median	Mean	Median
Children's work displayed in the classroom	47.8	47.0	41.6	42.0	6.22	5.00
Teacher smiles/laughs/jokes with students	48.4	48.0	41.6	42.0	6.81	6.00
Teacher uses local info to make content relevant	47.0	47.0	42.0	42.0	4.99	5.00
Teacher uses TLM other than the textbook	50.5	53.0	42.0	42.0	8.41	11.00
Teacher asks students to work in small groups	45.5	46.5	42.7	42.5	2.80	4.00
Students ask teacher questions	47.1	48.0	41.6	41.0	5.49	7.00

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4   We hope that the simple checklist developed for this study can be used more widely by cluster coordinators and block level staff to understand the classrooms under their charge and think of strategies to improve them.

Table 4.13
Child friendly indicators and test scores: Std 4

Classroom indicator	Std 4 classroom baseline score (%)					
	In classrooms where indicator = 'Yes'		In classrooms where indicator = 'No'		Difference ('Yes' – 'No')	
	Mean	Median	Mean	Median	Mean	Median
Children's work displayed in the classroom	44.0	42.5	37.3	36.0	6.70	6.50
Teacher smiles/laughs/jokes with students	44.7	43.0	37.5	36.0	7.17	7.00
Teacher uses local info to make content relevant	43.3	42.0	38.0	36.0	5.26	6.00
Teacher uses TLM other than the textbook	48.1	48.5	38.0	36.0	10.17	12.50
Teacher asks students to work in small groups	45.7	44.5	38.0	36.0	7.63	8.50
Students ask teacher questions	42.8	41.0	37.4	36.0	5.46	5.00

Q16 In your experience, which children find it the most difficult to learn?
Rank the following options from 1 to 5, where 1 is the answer you most agree with and 5 is the answer you least agree with.
- ☐ No particular group of children, all are the same.
- ☐ Girls have more difficulties than other students.
- ☐ Children from lower castes have more difficulties than other students.
- ☐ Children whose parents are illiterate have more difficulties than other students.
- ☐ Children who do not take tuition have more difficulties than other students.

parents. More than half of responding teachers ranked the option "The parents don't help their children to study" at 1 (indicating maximum agreement), whereas an even higher percentage ranked the statement "The school doesn't provide support to children who aren't learning well" at 4 (indicating maximum disagreement).

A common belief among teachers, then, appears to be that schools (and teachers) are already doing what they can to help weaker students.

There is clearly a huge gap between policy and practice in terms of the scaffolding that is needed for effective teaching and sustained learning. A great deal of the discourse in India is focused on the philosophical, cognitive and pedagogical underpinnings of how to teach children and how children learn. There is much

less discussion on how to help teachers create vibrant and fertile learning environments.

Translating policy into practice is the key to transformation, and to do this, the realities of current practice must inform policy. Changing practice is not easy especially when teachers and parents have themselves come from schools where teaching-learning was done in regimented and traditional ways. With the new law guaranteeing the Right to Education, there is likely to be a renewed focus on teacher training. The data and trends uncovered in this study could provide important inputs into the process of building a new cadre of teachers in India – teachers who in training can practice "child friendly" classroom methods and learn how to make this happen. Large scale data from close to 1000 schools in the study reinforces the notion that "child friendly"

> **Q18** In your experience, what is the most important reason why some children in your school don't learn well?
> *Rank the following options from 1 to 4, where 1 is the answer you most agree with and 4 is the answer you least agree with.*
>
> ☐ The children don't study enough.
>
> ☐ The parents don't help their children to study.
>
> ☐ The school doesn't provide support for children who aren't learning well.
>
> ☐ The brighter children all go to private schools.

classrooms boost children's learning. The current context in India and the key findings from this section provide an opportunity. If teacher training programs are designed with these findings as a starting point, a great deal could perhaps be to improve basic learning outcomes.

TEACHERS AND TEACHING | 5

Summary

This chapter examines patterns in teacher characteristics and teaching ability and relates them to students' learning outcomes.

Teacher characteristics

- No relationship was found between specific teacher background characteristics (e.g., years of experience, gender, age, educational or professional qualifications) and student learning outcomes.

Assessing teaching capability

- An anonymous teaching questionnaire was administered to assess teachers' teaching capability. This involved assessing both whether teachers were able to correctly answer simple questions in language and math, and whether they were able to explain the process of getting to the answer in simple steps and using easy language.

- In math, teachers were generally able to solve questions involving basic numeric operations and explain the process. Questions requiring applied knowledge were correctly answered by fewer respondents. Teachers encountered the greatest difficulty when asked to create their own problems for students to solve.

- Similarly in language, teachers performed much better in tasks involving simple corrections (e.g., spelling mistakes) than more complex tasks such as writing summaries of text.

- In math, the mean classroom score of children increases as teachers' score on the teaching assessment increases.

- Teacher appointment and training criteria could benefit from the utilization of similar simple diagnostic tools to gauge how best to improve teachers' ability to teach.

Introduction

The previous chapter examined the relationship between classroom environment and activities and children's learning outcomes. In this chapter we try to unpack the figure of the 'teacher' along several different dimensions. The chapter is divided into two sections:

- ▲ How do teachers' characteristics, such as gender, age, educational and professional qualifications, relate to children's learning outcomes?

- ▲ What do we know about teachers' ability to teach primary school language and math, and its relationship to student learning?

Teacher characteristics

During the baseline visit for this study, all teachers in sampled schools were asked to fill out a Teacher Information format intended to capture a variety of socioeconomic, educational and professional characteristics. Formats were received from a total of 2,501 teachers (74%). This section describes some teacher characteristics and how these relate to student outcomes.

As **Table 5.1** below shows, about one third of all teachers in this sample were women; this proportion is higher in Andhra Pradesh and lower in Jharkhand. About two thirds are between 30 and 50 years old, although Assam has more older teachers and in Jharkhand and Andhra Pradesh

almost a quarter are younger. The vast majority of teachers are married, but in Assam a large proportion are not.

Tables 5.2a and 5.2b summarize teachers' highest educational level and professional qualification by teacher type.[1] Notably, one in five regular teachers report having completed Std 10 or less; the same percentage reported completing 12 years of schooling. In Assam, more than half of regular teachers report completing ten years or less of schooling.

A higher proportion of regular teachers (61.5%) reported having at least graduate level qualifications (B.A. or higher) than para teachers (52.3%). The differences across teacher type were more noticeable when it came to professional qualifications. Almost all regular teachers (94.4%) reported having some kind of professional qualifications whereas this figure was substantially lower among para teachers (71.9%).

Table 5.3 provides some interesting data on teachers' tasks during school hours. Where information was provided, teachers most often reported teaching most or all classes from Std 1–5; as the data shows, there is little specialization other than the fact that "other" teachers (typically community volunteers) teach lower classes more often than higher ones. By contrast, a clear hierarchy is evident when it comes to the assignation of non teaching tasks. Whether these involve filling registers, supervising the midday meal, organizing extracurricular activities or anything else, teachers' involvement with these tasks increases as one

<div align="center">

Table 5.1
Selected teacher characteristics by state (%)

</div>

State	Sex (%)			Age (%)					Marital status (%)			
	Male	Female	Total	<29	30–39	40–49	50+	Total	Single	Married	Other	Total
AP	57.3	42.7	100	23.7	33.7	32.6	10.0	100	15.9	83.5	0.6	100
AS	67.6	32.5	100	12.4	21.8	38.2	27.7	100	27.5	70.7	1.9	100
HP	60.4	39.6	100	11.3	38.5	40.2	10.0	100	6.0	94.0	0.0	100
JH	78.1	22.0	100	24.2	38.9	17.4	19.5	100	7.4	91.7	1.0	100
RJ	63.5	36.5	100	11.9	39.5	32.7	15.9	100	4.7	92.2	3.2	100
Total	**65.6**	**34.4**	**100**	**17.0**	**35.2**	**31.5**	**16.3**	**100**	**11.3**	**87.3**	**1.4**	**100**

---

1   These data were self-reported by teachers.

Table 5.2a
Educational background: Regular teachers (%)

State	Educational qualification						Professional qualification					
	< Std 10	Std 10	Std 12	BA	MA	Total	None	Dipl.	B.Ed.	M.Ed.	Other	Total
AP	0.0	0.8	10.7	62.7	25.8	100	0.4	26.7	64.2	6.3	2.5	100
AS	9.6	48.7	30.8	7.7	3.2	100	23.5	42.4	2.4	0.0	31.8	100
HP	2.8	33.7	17.5	29.1	16.8	100	11.7	26.5	32.1	4.6	25.0	100
JH	0.0	17.8	19.6	41.1	21.5	100	6.9	51.7	21.8	4.6	14.9	100
RJ	0.0	4.9	20.1	38.4	36.7	100	1.3	15.0	60.7	5.1	17.9	100
Total	**1.9**	**17.7**	**18.9**	**37.4**	**24.1**	**100**	**5.6**	**25.8**	**47.4**	**4.8**	**16.5**	**100**

Table 5.2b
Educational background: Para teachers (%)

State	Educational qualification						Professional qualification					
	< Std 10	Std 10	Std 12	BA	MA	Total	None	Dipl.	B.Ed.	M.Ed.	Other	Total
AP	1.3	21.3	32.0	40.0	5.3	100	33.3	10.4	45.8	2.1	8.3	100
AS	0.0	38.1	42.9	19.1	0.0	100	54.6	27.3	0.0	0.0	18.2	100
HP	0.0	2.6	48.7	33.3	15.4	100	65.5	0.0	20.7	0.0	13.8	100
JH	0.6	1.8	40.2	49.6	7.9	100	21.8	50.0	6.8	2.7	18.6	100
RJ	0.0	16.1	41.9	29.0	12.9	100	15.8	31.6	31.6	10.5	10.5	100
Total	**0.6**	**7.2**	**39.8**	**44.3**	**8.1**	**100**	**28.1**	**37.9**	**15.0**	**2.8**	**16.2**	**100**

Table 5.3
Teacher responsibilities by teacher type (%)

Teacher type	Which class (es) do you currently teach?*						What duties do you have besides teaching?*					
	Std 1	Std 2	Std 3	Std 4	Std 5	Std 6+	Regis-ters	MDM	Extra curric	Other admn	Other offic	Other
Head	49.9	47.2	48.7	54.5	41.0	19.3	74.6	57.7	51.4	58.5	39.3	14.6
Regular	39.5	40.6	44.3	43.9	39.5	27.0	58.2	40.8	41.7	23.2	18.0	5.9
Para	55.5	56.1	55.9	59.6	58.2	30.2	44.9	37.3	41.0	17.7	8.4	4.9
Other	60.3	55.2	55.2	49.1	31.0	18.1	40.5	36.2	27.6	13.8	10.3	7.8

* Rows do not add up to 100% because teachers usually teach multiple classes and perform multiple duties. Therefore, the categories of classes and duties reported in the table are not exclusive of each other. For example, a head teacher may have said that she teaches all classes at the school.

goes up the hierarchy of teachers – with "other" and para teachers least involved and head teachers most involved in their execution.

Do any of these characteristics have a relationship with student learning outcomes? To answer this question, we discuss findings for a subset of teachers, comprising those teachers who have been identified as the only teachers of Std 2/Std 4 within our sample schools. We are able to comment with some degree of certainty on the relationship between teachers' characteristics on student test scores using this subset because we know that for these students there was no other teacher who was teaching Std 2 and/or Std 4 at the time.

Sample description of matched teachers

Table 5.4 outlines major characteristics of the 766 teachers (25% of the total sample) who fall within this subset. As in the full sample, the majority of teachers are 'regular' (54%), male (66%), and between 30–49 years old (70%). In terms of qualifications, 51% of teachers who

Table 5.4
Sample description of matched teachers to classrooms[*]

Teacher type	N	%	Education level completed	N	%
Head teacher	194	26.8	< Std 10	23	3.1
Regular teacher	391	53.9	Std 10	165	22.0
Para teacher	117	16.1	Std 12	195	26.0
Any other type of teacher	23	3.2	Graduate	256	34.1
Total	**725**	**100**	Postgraduate	111	14.8
			Total	**750**	**100**
Gender	**N**	**%**	**Teacher training**	**N**	**%**
Male	506	66.1	None	81	14.2
			Diploma	186	32.5
Female	259	33.9	B.Ed.	212	37.1
			M.Ed.	19	3.3
Total	**765**	**100**	Other	74	12.9
			Total	**572**	**100**
Age	**N**	**%**	**Teacher experience**	**N**	**%**
19–29 yrs	106	15.6	0–5 yrs	199	27.2
30–39 yrs	250	36.8	6–10 yrs	163	22.2
40–49 yrs	227	33.4	11–15 yrs	171	23.3
50–59 yrs	93	13.7	16–20 yrs	72	9.8
> 60 yrs	3	0.4	> 20 yrs	128	17.5
Total	**679**	**100**	**Total**	**733**	**100**

The totals (N) vary across different sections of the table due to missing information.

provided information reported completing Std 12 or lower, whereas about 64% reported having some kind of preservice teachers' training, mainly Diploma or B.Ed. programs.

Teacher characteristics and average class scores

Detailed analysis was done with this matched sample of teachers and children to link different teacher characteristics with children's scores. Does the age of teachers matter? What about gender? Educational qualifications, training? Do students of regular teachers do better than those taught by para teachers? The conclusion reached from these analyses was that these teacher characteristics have no relationship with average class scores. In addition, for every teacher characteristic, the distribution of the students' test scores is very widely spread, both in Std 2 and Std 4. Two examples – showing mean class scores by teacher education and teacher preservice training – are provided in **Fig 5.1** and **5.2**.

This analysis suggests that teacher characteristics alone do not explain the differences in average class scores within our sample schools. School and classroom factors need to be factored in, along with teacher characteristics, in order to better explain the relationship between teachers and student learning levels.

Assessing 'teaching capability'

One of the main objectives of the current study is to understand teachers and learners and the context of teaching and learning in government schools. While there is growing interest and work on teachers, there

Chart 5.1
Average Std 2 and 4 total scores by teacher education
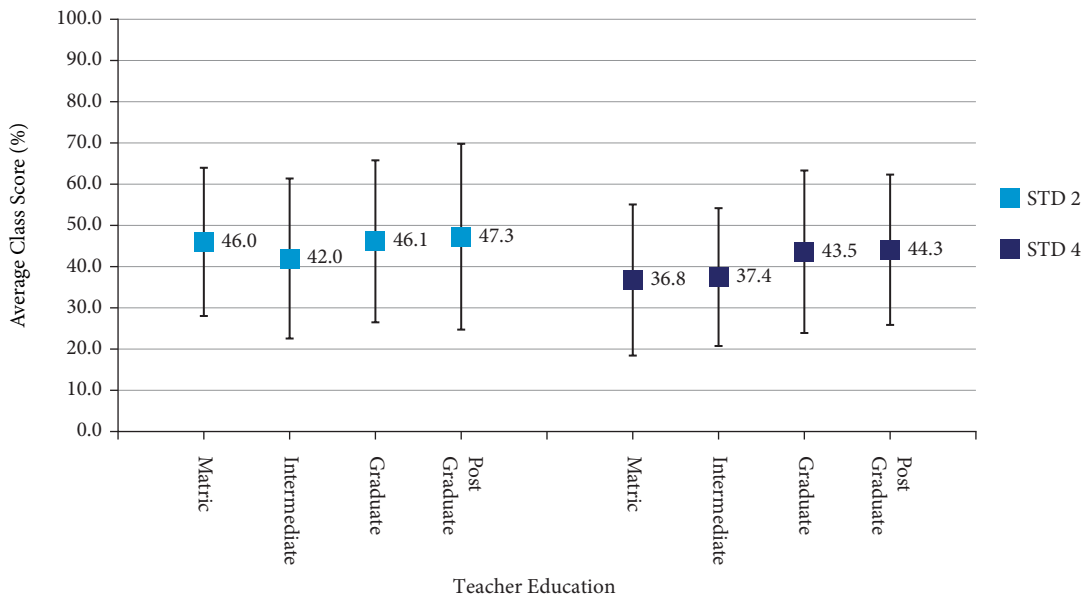
Chart 5.2
Average Std 2 and 4 total scores by teacher pre-service training
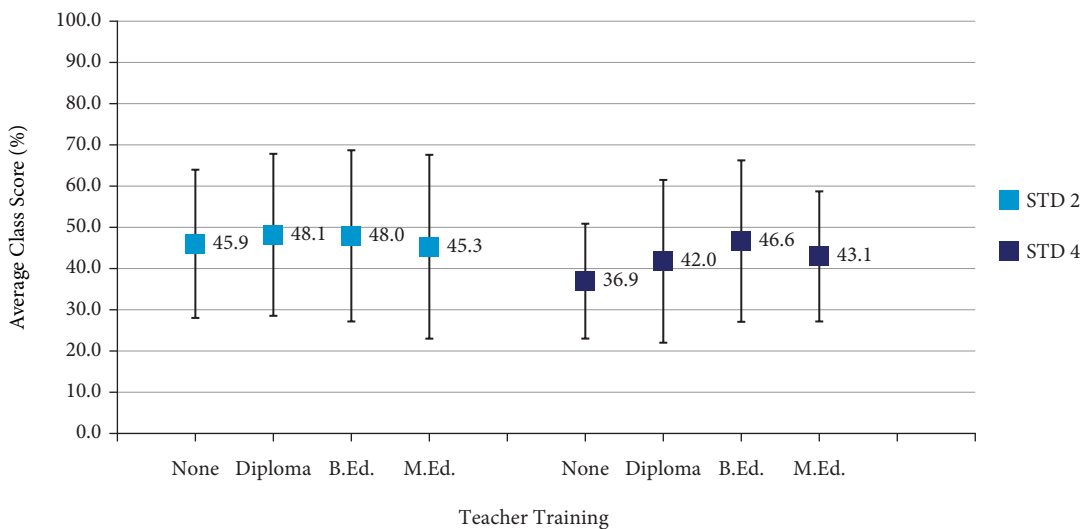
is less research available on *teaching,* especially in large scale studies. In India, studies linking teachers and teaching with students and learning are rare. Even rarer are studies that attempt to get at what teachers know or are able to do.[2] One objective of this study is to gain a better understanding of teachers and their capacities to teach against the larger backdrop of how schools function.

The topic of teacher competence and capability and its possible links to student attainment has been studied extensively in other countries. From literature reviews, several key dimensions surface repeatedly (Kane et al. 2010, Alexander 2008). These include content knowledge and application, instructional skills and pedagogical knowledge, classroom management, and time on task. Methods for observation and measurement vary from study to study and context to context. Overall, studies acknowledge that teaching-learning processes are difficult to quantify or measure but that what teachers *do* in classrooms is very important to understand if we are to improve student learning.

As India prepares to implement the Right to Education Act, one of the key aspects of guaranteeing education will hinge on preparing teachers to teach effectively so that all children can learn. Empirical explorations of teaching and teachers' current capability to teach are critical elements for the satisfactory functioning of any school system. This section examines some aspects of what teachers know and ways in which this knowledge influences classroom practice.

Teaching capability assessment: What was done?

Building on the learnings from the SchoolTELLS study in Uttar Pradesh and Bihar,[3] the design

and content of the "teaching questionnaire" were intended to get at some core issues related to teaching and understanding what children do. During the final visit to sample schools a specially designed questionnaire was administered to all teachers who were present during the field visit and who taught primary grades in these schools. The questionnaire aimed to capture teachers' knowledge of basic language and math, their ability to teach and also their understanding of student abilities in these subjects. The content of many items was related to and sometimes identical to the questions administered to Std 4 children. Major areas covered included:

- *What can be learnt from children's work:* These questions were designed to assess how teachers look at students' work, especially when students make mistakes. Questions and answers from the test administered to Std 4 children in the same schools were used to ask teachers about children's responses.

- *How to explain to children:* A number of tasks were intended to capture the ways in which teachers explain content to children. These included meanings of difficult words, summaries of long texts, and steps in basic arithmetic operations.

In order to encourage teachers to complete the written format freely and without fear, the questionnaire was anonymous; however those teachers who agreed to provide responses did so in the presence of a field investigator. Depending on the state, questionnaires were administered in Hindi, Assamese, Bengali and Telugu.[4] A total of 1,830 responses were obtained from teachers across the 5 states, representing 59% of all appointed teachers in the sampled schools.

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2   Some studies that have attempted to assess teachers include one carried out in Bellary district in Karnataka by Azim Premji Foundation. Also see Bashir (1994) for Tamil Nadu for Madhya Pradesh and a recent study in Bhutan by Educational Initiatives (2008).

3   In many ways, the SchoolTELLS study carried out in Uttar Pradesh and Bihar in 2007-2008 school year is a precursor to the current study. SchoolTELLS was an in-depth comprehensive study of 160 schools that explored a variety of village, teacher, student, household characteristics along with different dimensions of functioning of schools, organization of classrooms, use of time etc. as well as student achievement during the course of one school year. Each school was visited four times during the school year. SchoolTELLS covered private schools and government primary schools in the sampled villages.

4   One of the sampled districts in Assam uses Bengali.

Gauging teacher capability for teaching math

The math teaching component of the questionnaire contained eight questions categorized in three basic ways:

- *Identifying mistakes made by children:* For three questions, teachers had to look at and correct the answers that children had given to specific questions. These questions were aimed at understanding whether a teacher was able to gauge if a child has been able to do his/her work correctly.

- *Explaining operations:* An additional three questions addressed the ability of teachers to explain a process or lay out the correct way to solve a problem.

- *Generating problems:* There were two questions where teachers had to use the information provided to generate problems for students. These tasks were an attempt to see how creative teachers could be in creating their own word problems given their own context and the level of their children.

a. Understanding children's work

Looking carefully and regularly at children's work is one of the best ways to learn about children's understanding of a subject. In the following example, teachers were given a sample of a question that had been solved by a child. Based on this, teachers were asked to deduce what the child knew. We provided the teachers with 6 statements. From these statements, they chose the statements they agreed with.

Q1: Looking at this child's work, what can you say about what the child knows?

11% of all teachers did not attempt the question. Three quarters of all teachers agreed that this child does not know numbers till 100 or place value and 68% agreed that the child could not do addition with carrying forward.

Apart from classroom interactions, another important activity for teachers is corrections. If a teacher corrects children's work regularly and pays attention to patterns, she will be able to see the repeated mistakes that children make.

Q7. This question was given to children studying in Std 4. They were asked to measure the length of the pencil in centimetres. Many children made mistakes while solving this question, what is the correct answer?[5]
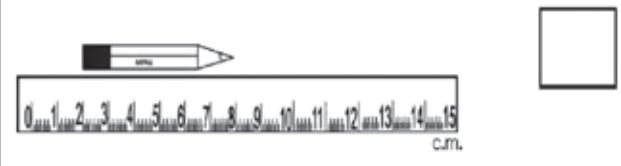
Almost all teachers attempted to answer this question. About 82% of all teachers were able to give the correct answer. It is worrying that close to 20% of teachers could not answer correctly.

Q8. This question was given to Std 4 children. The 3 digits can be rearranged to form many different 3 digit numbers. Make any 3 numbers out of these digits and arrange the numbers in ascending order.

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5   This question is taken from Educational Initiatives test items. Educational Initiatives uses this question with children.

In another question, three samples of children's work were given[6] and the teacher was asked to indicate whether the child had done the task correctly or not. Close to 90% of teachers were able to do this task correctly.

These three tasks provide just a few examples of what teachers need to do when looking at children's very basic arithmetic abilities. The data suggest that it is relatively easy for teachers to do simple corrections of children's written work. However, the interpretation of what they gauge from children's work needs more probing which may be beyond the ambit of a written pen-paper questionnaire format.

b.   Explaining content to children

In the second set of questions in the teacher capability questionnaire, two examples of how a child has solved a three digit by one digit division problem are provided. In both samples the child has solved the problem incorrectly. The teacher was asked to write down how to solve the problem correctly. Responses were graded as correct if the correct steps were written and the answer was correct.

A three digit number being divided by a one digit number is a common numerical problem in Std 4 textbooks in most states. **Table 5.5** presents the percentage of teachers who solved the problem and wrote down the correct steps.

Q2: Below are samples of a division problem solved by two students following different processes. How would you show the children how to solve the problem correctly?

Interestingly, almost all teachers attempted these questions. Except for Jharkhand, over 80% of teachers in each state were able to write clear and correct solutions. The data for this question indicates that laying out the process step-by-step for a common numerical operation was not difficult for the majority of teachers in most states. However, as in previous questions, the 18% figure for teachers who were unable to do this simple task correctly is alarming.

Now we move to the solving of word problems. The two tasks given are common tasks seen in Std 4 textbooks in many states. One task involves computing percentages. The second task is calculating area. In both cases the teacher was asked to write down the steps clearly so that children could follow and understand the steps. This is a

Table 5.5
Teachers' ability to explain the process for division (%)

State	Explanation wrong	Explanation correct	Not attempted	Total
Andhra Pradesh	14.4	85.6	0.0	100
Assam	10.6	88.9	0.5	100
Himachal Pradesh	11.6	88.4	0.0	100
Jharkhand	28.5	71.5	0.0	100
Rajasthan	20.1	79.7	0.3	100
Total	**17.7**	**82.2**	**0.1**	**100**

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6   Only 2 examples of children's work is shown in the sample provided.

Table 5.6
Teachers' ability to solve percentage and area problems (%)

State	Question 3 (percentage)				Question 4 (area)			
	Wrong	Correct	N.A.	Total	Wrong	Correct	N.A.	Total
Andhra Pradesh	26.2	68.7	5.2	100	18.8	71.1	10.2	100
Assam	41.5	53.5	5.1	100	26.7	64.1	9.2	100
Himachal Pradesh	34.4	61.3	4.3	100	16.5	77.5	6.1	100
Jharkhand	39.6	54.0	6.5	100	23.0	68.4	8.6	100
Rajasthan	41.6	48.1	10.3	100	15.5	71.1	13.5	100
Total	**35.5**	**58.2**	**6.3**	**100**	**19.6**	**70.8**	**9.6**	**100**

The questions given below are taught to children in Std 4 or 5. Usually children do not know how to solve these questions correctly. Write down the steps involved so that children can understand how to solve them.

Q3

38 children are enrolled in a class. Out of these 23 are present. What percentage of children are absent?

Q4

In order to plant a mango tree, you need 25 m square area. If a field is 80 m long and 70 m wide, how many mango trees can be planted in this field?

common practice in Indian classrooms: the teacher writes on the board and the children follow the process and usually note it down in their notebooks.

Table 5.6 displays the percentage of correct, incorrect and not attempted responses for these questions. Compared to some of the earlier questions where all teachers attempted the question, here five to ten percent of teachers did not attempt the questions. The percentage problem seems to be more difficult with less than 60% of teachers being able to solve it correctly. In the case of the area problem, this figure is at 71%. This means that four out of ten teachers could not solve a simple percentage problem correctly and three out of ten could not solve an area problem correctly. Across the 5 states Andhra Pradesh has the highest proportion of teachers who solved Q3 correctly (69%) and Himachal Pradesh has the highest proportion of teachers who solved Q4 correctly (76%). Rajasthan has the highest

proportion of teachers who did not attempt both questions i.e., 10% and 14% respectively.

It is worth noting that a very high proportion of the teachers who were able to solve the problem correctly were also able to explain the steps clearly. This suggests that the knowledge of a competency is highly correlated with the ability to explain and lay out steps.

c. Generating problems and applying knowledge

Apart from the textbook, a good teacher should be able to generate context-specific problems for students to solve. Ideally, such problems should keep in mind what the children can do and also link the children's own surroundings to what they are learning. The National Curriculum Framework stresses the importance of linking children's context to what they are learning.

Teachers were asked to construct math word problems meant for Std 4 children. Responses were marked as

correct only if the teacher had used all the information that had been given. That is, all three numbers and both given operations had to be used in creating a word problem. If these criteria were not met, the response was marked as incorrect.

Table 5.7

Teachers' ability to generate word problems (%)

State	Q.5 % correct	Q.6 % correct
AP	53.7	48.3
AS	43.8	25.8
HP	52.0	44.8
JH	33.1	25.7
RJ	29.5	27.2
Total	**42.9**	**35.8**

Only 43% and 36% of all teachers were able to correctly design math problems using the operations and numbers specified. The lowest proportion of teachers that were able to correctly design problems for Q5 & Q6 comes from Rajasthan and Jharkhand respectively.

Overall, we find that the questions that did not require teachers to explain their work were the easiest for them to do. Explaining and laying out steps for numerical operations like division was also easy and a majority of teachers could do it without difficulty. However when it came to higher skills like calculating area or computing percentages, it was harder for teachers to do them correctly with logical and easy to understand steps and sequences. Among the tasks given to them in this questionnaire, the hardest task was that of developing their own

word problems, which requires both understanding the concepts and applying them in a non-routine manner.

Gauging teacher capability for teaching language

As in the math section, the language component of the questionnaire consisted of 3 types of questions.

- *Identifying mistakes:* Teachers were asked to identify common language mistakes from a written sample (spelling mistakes).

- *Understanding children's comprehension:* Teachers were asked to identify children's language comprehension abilities.

- *Explaining/summarizing text:* Teachers were asked to write a short summary of a Std 4 level story.

We present examples of each of these questions.

a. Identifying children's mistakes

In one question, teachers were asked to pick out common language mistakes from a short paragraph. Here we present the results of whether teachers were able to identify spelling mistakes. In all, the paragraph contained 8 spelling mistakes in each language sample (Telugu, Hindi, Bengali and Assamese).

About 10% of all teachers did not attempt this question (**Table 5.8**). Jharkhand shows the largest proportion of no-attempts. Out of a total of eight spelling mistakes, less than half of all teachers across the 5 states were able to identify 6 or more spelling mistakes.

b. Understanding children's language comprehension ability

In another question, teachers were told that a Std 4 child had read the paragraph and had circled responses to the questions based on the paragraph. Teachers were asked to identify whether the options circled were correct or incorrect.

Table 5.8
Teachers' ability to identify mistakes in a written text (%)

State	0–5 mistakes	6–8 mistakes	No attempt	Total
AP	47.7	47.1	5.2	100
AS	86.2	12.0	1.8	100
HP	20.8	75.4	3.8	100
JH	47.7	30.5	21.8	100
RJ	34.1	52.2	13.8	100
Total	**44.6**	**45.5**	**10.0**	**100**

Table 5.9
Teachers' ability to correctly assess children's language comprehension (%)

State	Q11A	Q11B
AP	77.4	75.6
AS	87.6	91.0
HP	86.7	89.3
JH	65.0	69.5
RJ	82.5	86.5
Total	**80.1**	**83.1**

Q10 नीचे दिए गए अनुच्छेद में कुछ सामान्य गलतियाँ हैं। अनुच्छेद को ध्यानपूर्वक पढ़ें एवं गलतियों पर घेरा लगायें।

जंगल के पास आश्रम में कई शिष्या रहते थे। उनमें अरुण भी था। सभी शिष्य आदर करते थे। एक दिन बरसत में गुरूजी ने अरुण को खेत की मेड़ बांधने को कहा। जब वह पहुँचा तो मेड़ टुट चुकी थी। उसने मेड़ बनाने की कोशीश की लेकिन पानी नहीं रोक पाया। गुरूजी की बात का मान रहे इसलीए पानी रोकने के लिए वह स्वयं लेट गया। शाम को सभी शिष्य लौट आये मगर अरुण नहीं आया। गुरूजी शिष्यों के साथ सवयं से खेत पहुँचे अरुण को मेड़ पर लेटा देख आँसु निकल पड़े।

Table 5.10
Teachers' ability to write a summary of a given text (%)

Not attempted	12.2
Gave meaningless summary	14.2
Covered some main points	45.4
Covered all main points	28.2
Total	**100**

Almost all teachers attempted this question. Over 80% of all teachers attempted and evaluated the child's response correctly (**Table 5.9**).

c. Teachers' ability to meaningfully summarize text

Most classroom activity in the classrooms visited is anchored by the textbook. Usually a chapter is read out aloud either by the teacher or by children and then a number of different activities guided by the textbook are done. Summarizing the key points that have been covered is an important element of effective teaching. For the teacher it is important to be able to identify the key points from the material being transacted. For children, summarization reinforces content covered.

Teachers were asked to summarize a given paragraph. They were graded on the basis of the relevance of the summary, use of simple language and also whether they had captured the main points of the story (**Table 5.10**).

12% of all teachers did not attempt this question. 14% of all teachers gave a 'meaningless' summary (that is, one with no apparent connection to the story). Less than 30% of all teachers provided a summary that covered all the main points of the story.

On the language component, teachers did relatively well on simple correction tasks where they had to assess children's responses. In contrast, they performed poorly when they were asked to provide summaries.

Teaching capability and children's learning outcomes

To what extent is teachers' content knowledge, as measured by this tool, reflected in children's learning outcomes? To answer this question, we looked at a subset of approximately 700 teachers and 8,500 Std 2 and Std 4 students.[7] **Table 5.11** presents the results of this analysis for math.

We see that as the categories of teacher performance improves from below average to above average, the observed mean and median scores in the classroom increase, suggesting that teachers' capabilities are positively related to student achievement. This mirrors the findings in Metzler & Woessman (2010).[8]

Implications of these findings

The teaching capability questionnaire was an attempt to understand some dimensions of teacher knowledge and teaching ability using a self reported pen and paper questionnaire format. While the appropriateness of the method of assessment can be debated, there are some interesting learnings:

- First, simple "corrections" of basic competencies can be done well by teachers.[9]

- Second, ability to explain clearly is easier to do for simpler concepts or operations than for those that have slightly higher levels of difficulty.

- Third, teachers are weakest when it comes to application of their knowledge/skill to a given situation where they have to take the initiative to generate something new (such as a meaningful summary or a problem).

- Fourth, as the tasks increased in difficulty, the proportion of teachers not attempting the question rose. It is always difficult to interpret what is implied in the act of not participating. But the fact that everyone tried to do the simple tasks and not everyone tried to do the harder ones is interesting.

This study reached 900 schools in different corners of India. The schools and classrooms, children and teachers were visited three times during the course of two school years. Given this context, the methods for data collection were largely quantitative in nature and

Table 5.11
'Teaching capability' and student learning outcomes: Math (Std 2 and 4)*

Teacher capability	Std 2			Std 4		
	Mean class score	Median class score	SD	Mean class score	Median class score	SD
Below average	59.2	60.0	16.0	46.3	44.0	14.6
Average	59.3	62.0	15.5	48.1	43.0	16.2
Above average	63.3	64.0	16.2	52.6	54.5	15.9

* Results presented in these tables only taken into account teacher's ability to compute correct answers to math questions and not their ability to explain the answers.

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7   In some schools, children of a given grade were taught by more than one teacher. In these schools, it is obvious that the characteristics of more than one teacher might affect the score of each child. Therefore, in order to isolate the effects of teacher characteristics on children's learning outcomes, we examined the outcomes of only those children who were taught by a single teacher.

8   Metzler & Woessman use rural data from Peru that contains test scores in two subjects for both the students and teachers in primary schools. They analysed whether the same student taught by the same teacher performs better in one of the subjects if the teacher's knowledge in one of the subjects is relatively better. Their paper finds that teacher subject knowledge is statistically significant. It finds that when teacher test scores increase by 1 SD, the corresponding effect on student test scores is an increase of 10% of a Standard Deviation.

9   Unfortunately, we are not able to link the ability of teachers to "correct" children's work with their actual practice of looking at children's written work in their classes. Neither are we able to see whether what teachers see in terms of mistakes or confusions in children's work informs their subsequent teaching.

the instruments were designed accordingly. It is likely that there will be debate and discussion on the way that teaching capability has been measured. This study has taken only three broad domains of what teachers are expected to do as they teach: look at children's work, explain concepts and operations and generate new content/activities. These types of situations were simulated in the form of a pen-paper questionnaire format rather than observed in the classroom.

The analysis even of these limited domains offers interesting insights on teaching practice. We hope that the discussion of this work will lead to more such studies that attempt to understand what it takes to make teaching effective.

The section on teacher characteristics and student learning indicated that there is not much of a direct relationship between teachers' educational and professional qualifications and average classroom test scores. This is not to say that teachers should not be well qualified or well trained. The findings suggest that the current nature of qualifications and usual types of teacher training are not sufficient to guarantee effective teaching. A much closer look at what teachers know and what they are able to do

is needed along with how they translate their own capabilities into practice.

The findings of this chapter indicate promising ways in which teacher preparation can be shaped. In the section on teachers and teaching we have tried to highlight the kinds of abilities and skills that teachers need to teach language and math in primary grades, but clearly do not have. Using samples of children's work in teacher training will help reinforce the importance of looking at what children are doing in a regular and sustained way. It will also help trainers to understand what teachers "take away" from children's work. Asking teachers to explain common tasks that they have to do based on textbook chapters will enable trainers to see whether teachers lack subject or concept knowledge or are simply unable to communicate effectively. Finally, gauging teachers' ability to generate their own problems or summaries will also uncover the nature of support that is needed to help them link what they teach from the textbook to children to their surroundings. This kind of assessment effort could be used in teacher training (whether in-service or pre-service) to understand the type and amount of support and preparation teachers need in order to teach well.

FAMILIES | 6

Summary

Detailed information on the households of sample children was collected during the second visit of the study. This chapter summarizes some key household characteristics and examines how these relate to children's school attendance and learning outcomes.

Socioeconomic characteristics

- Households of sample children vary widely in terms of socioeconomic indicators. Across the sample, higher economic status correlates positively with children's attendance and learning outcomes.

- Educational levels of families are generally low across the sample. But parents' and particularly mothers' education is strongly related to children's learning.

Home literacy environment

- Most children in the sample came from households which had few, if any, print materials available at home other than the textbooks. The availability of print materials in the household correlates with better learning outcomes.

- Children whose home language differs from the language of instruction in schools performed substantially worse in baseline and endline assessments than children whose home language matched the school's language of instruction.

Academic support outside school

- Less than half the sampled children had attended any type of preschool program. Children who had attended preschool were found to attend school more often. However, no consistent relationship was observed between preschool attendance and learning outcomes.

- Children who received academic support outside of school (about two thirds of the sample) performed better than children who did not. However, the positive relationship between children's learning and extra help outside of school was mainly seen among children who received help from parents rather than from other family members or elsewhere.

- Children who took paid private tuition classes attended school less often. But in Std 2, their learning outcomes were no better than those of other children. In Std 4, children who took private tuition had *poorer* learning outcomes than those who did not.

Introduction

The students randomly sampled for this study come from a variety of backgrounds; the common denominator is that they all attend government primary schools. This chapter begins with an overview of what their families are like in terms of key socioeconomic indicators. We then look at how family characteristics relate to children's attendance and learning outcomes, in two ways:

◣ *What families have:* this includes indicators of income and assets, as well as indicators of the "stock" of education available within the household, as measured by parents' schooling. We also include indicators of the home literacy environment, as measured by the availability of print materials in the home and the match between home language and the school's language of instruction.

◣ *What families do:* this includes sending children to early childhood programs, and providing additional learning support in terms of help from family members, other individuals or organizations, or paid tuition classes.

Socioeconomic characteristics of sampled households

◣ *Family demographics:* Families of the children in our sample have very different characteristics on a number of dimensions:

♦ They vary in size, from an average of almost seven persons per household in Jharkhand to fewer than five persons per household in Andhra Pradesh. But in every state, about half of all household residents are under the age of 15 (**Table 6.2**).

♦ Educational levels are low. Even among younger adults (18–40 yrs), well over half of all women in these households have never been to school; this proportion is close to 90% among older women. Among women in the younger age group, those in Himachal Pradesh have the most schooling and those in Rajasthan have the least (**Table 6.3**).

Box 1. Married children

5.1% of all children age 6–14 years in the households of sampled children were married. Among children in the sample this proportion is lower since they comprise children from Std 2 and Std 4 only, and is almost identical for boys (3.2%) and girls (3.1%).

Table 6.1: Married children in the sample (%)

State	% sampled children who are married
AS	5.1
AP	5.6
HP	1.2
JH	1.1
RJ	3.8
Total	**3.2**

Table 6.2
Age distribution of residents in households of sampled children, by state (%)

State	Average household size	Household residents by age category (%)						
		0–2	3–5	6–10	11–14	15–17	18+	Total
AP	4.9	1.9	7.0	28.9	9.8	3.2	49.2	100
AS	5.6	4.2	9.5	25.3	12.5	5.5	43.1	100
HP	5.9	2.4	7.5	27.3	12.8	4.5	45.5	100
JH	6.8	4.2	9.7	23.9	10.9	5.1	46.3	100
RJ	6.1	3.4	8.6	24.8	13.9	6.9	42.3	100
Total	**6.0**	**3.4**	**8.7**	**25.7**	**12.0**	**5.2**	**45.2**	**100**

- Regardless of years of schooling, all household residents were asked to read a short paragraph at the level of difficulty of a Std 1 textbook. The ability to read simple text is far greater among younger (17–40 yrs) adults than among older ones; and far greater among men than women (**Table 6.5**). Reading ability across states broadly matches adults' experience with schooling.

- *Economic characteristics:* The sampled children live in strikingly different conditions, depending on which state they live in:

  - Except in Andhra Pradesh, the majority of households have only one income earner. About one in three households has two income earners (**Table 6.6**).

  - Almost half of all sampled students live in a kuccha house; this proportion ranges from

Table 6.3
Educational background of adults in households, by gender and state (%)

State	18–40 years old (%)				41+ years old (%)			
	Men		Women		Men		Women	
	No schooling	5+ years schooling	No schooling	5+ years schooling	No schooling	5+ years schooling	No schooling	5+ years schooling
AP	47.5	46.2	68.6	25.7	77.7	17.3	96.3	2.1
AS	26.1	48.4	36.9	38.4	45.0	30.7	67.0	14.0
HP	14.2	80.1	38.1	56.5	50.0	42.6	88.6	9.0
JH	27.4	61.4	65.4	25.3	49.7	38.9	88.8	6.2
RJ	38.1	55.0	80.1	15.5	62.3	30.6	95.8	2.8
Total	**31.0**	**58.4**	**60.2**	**30.6**	**55.0**	**34.0**	**89.1**	**6.2**

Box 2. Children who have dropped out of school

During our visit to the sampled children's homes we recorded the schooling status of all 6–14 year olds living in their households. Overall, 3.9% of all children in this age group were reported as having dropped out of school. Of all children in this age group who had dropped out of school, as many as 22% of all boys and 24% of all girls were reported as having done so before completing Std 1. Across the states in our sample the highest proportion of dropouts was found in Assam (6.1%).

Table 6.4 summarizes dropout information by state, age and gender. Among 5–10 year olds, roughly equal proportions of boys and girls were reported as drop outs. Among 11–14 year olds, the proportion of dropouts is much higher, particularly in Assam, and differences in gender are evident. In Rajasthan, for example, the percentage of girl drop outs is nearly double that of boys.[1]

Table 6.4: Dropouts in the 6–14 age group (%)[1]

State	5–10 years old		11–14 years old	
	Boys	Girls	Boys	Girls
AP	2.0	1.8	7.5	9.8
AS	3.5	3.1	13.3	12.1
HP	0.5	0.7	2.4	4.3
JH	2.0	2.0	8.9	7.3
RJ	1.4	2.4	7.5	13.9
Total	**1.8**	**2.0**	**7.9**	**9.1**

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1 These estimates are similar to the estimates from ASER 2010. The denominator for these percentages is the total number of children in the relevant age group living in the households of sampled children. Sampled children are drawn from children enrolled in government primary schools. Therefore, these numbers should not be interpreted as estimates of dropout rates for the population as a whole.

Table 6.5
Reading ability of adults in households, by gender and state (%)

State	18–40 years old				40+ years old			
	Men		Women		Men		Women	
	% tested	% able to read	% tested	% able to read	% tested	% able to read	% tested	% able to read
AP	96.4	45.2	93.3	26.2	94.4	21.3	88.1	3.3
AS	83.9	55.5	78.1	46.4	73.4	39.5	61.5	19.6
HP	93.6	78.2	95.8	53.5	91.3	31.4	94.9	8.3
JH	94.2	56.6	92.8	22.2	93.2	40.5	89.4	5.9
RJ	95.2	50.4	93.4	13.3	92.4	26.7	91.3	3.8
Total	**93.3**	**55.6**	**91.2**	**30.0**	**90.1**	**34.1**	**87.8**	**6.6**

Table 6.6
Number of income earners in households, by state (%)

State	1 earner	2 earners	3–4 earners	5+ earners	Total
AS	67.6	25.1	5.7	1.0	100
AP	14.3	71.6	12.1	1.9	100
HP	80.6	13.3	3.4	0.3	100
JH	70.4	20.7	6.0	0.7	100
RJ	72.9	18.7	5.3	0.5	100
Total	**60.9**	**30.1**	**6.6**	**0.9**	**100**

Table 6.7
Household physical structure, by state (%)

State	Pukka	Semi pukka	Kuchha	Total
AS	12.8	14.6	72.7	100
AP	47.3	43.6	9.1	100
HP	39.7	14.9	45.4	100
JH	14.6	18.1	67.3	100
RJ	44.6	15.8	39.6	100
Total	**31.4**	**21.3**	**47.4**	**100**

Table 6.8
Access to electricity and water in the home, by state (%)

State	Electricity connection	Water source
AS	28.9	61.4
AP	96.8	29.3
HP	95.8	54.5
JH	50.8	19.4
RJ	51.5	19.6
Total	**63.6**	**33.8**

more than 70% in Assam to less than 10% in Andhra Pradesh (**Table 6.7**).

♦ Almost all sampled children in Andhra Pradesh and Himachal Pradesh live in homes with an electricity connection, as compared to less than a third of all children in Assam. Overall, only a third of all households have a water source at home, but children in Assam are far more likely

to fall into this category than those in other states (**Table 6.8**).

♦ Almost two thirds of all households had some kind of telephone at home; more than 40% had a television set. Substantial variations in asset ownership are seen across states. Assam, for example, had the lowest percentage of households owning a telephone, but the highest percentage of those owning a car.

More households in Rajasthan own some kind of motorized vehicle (scooter or car) than in any other state (**Table 6.9**).

What households "have" and its relationship with children's learning

Economic indicators

Without exception, the relationships observed in these data between household economic status, children's school attendance and learning outcomes show that higher economic status is highly correlated with higher attendance and better learning, both in Std 2 and Std 4 (**Table 6.10**).

Education level of household members

Parents' and particularly mothers' literacy is known to be an important influence on children's schooling. How does parents' schooling relate to children's attendance and learning levels? For students in this sample, children are more likely to have been in school on all three visits when either parent had completed primary

Table 6.9
Household assets, by state (%)

State	Phone	TV	Fan	Fridge	Cycle	Scooter	Car
AS	43.5	28.2	16.2	3.7	58.8	6.1	4.3
AP	63.8	68.7	78.4	1.3	41.0	7.8	0.1
HP	64.6	74.6	32.2	17.4	10.1	5.9	1.1
JH	35.4	16.0	13.7	1.7	83.2	7.7	0.3
RJ	64.8	33.0	42.3	5.0	43.4	16.9	1.0
Total	**53.7**	**43.2**	**36.9**	**5.4**	**49.5**	**8.9**	**1.2**

Table 6.10
Economic indicators of households and children's learning and attendance

Indicator	Categories	% of all sample children	% students found present on all 3 visits		Median test scores (%) – all children			
					Std 2		Std 4	
			Std 2	Std 4	Baseline	Endline	Baseline	Endline
No. of income earners	1	62.8	40.8	50.9	43	57	35	42
	2	29.7	49.7	60.1	45	64	39	52
	3+	7.6	45.2	59.2	45	62	39	52
Type of house	Kuchha	31.8	35.8	45.4	38	55	33	39
	Semi pukka	21.5	47.6	53.6	43	62	39	48
	Pukka	46.8	56.4	64.7	47	64	42	48
Source of water	Outside the village	34.6	37.8	45.5	35	49	30	36
	Inside the village	62.6	42.9	49.7	38	55	36	42
	Inside the house	2.8	47.3	64.2	47	66	39	52
Electricity connection	No	65.5	30.7	42.8	38	51	30	39
	Yes	34.5	52.2	58.4	45	62	39	48
Asset ownership index (scale of 0–4)	0 items	4.5	35.2	54.5	45	62	30	39
	1 item	42.0	40.0	48.7	40	55	36	39
	2 items	26.8	48.6	58.3	47	64	39	48
	3 items	18.8	58.0	63.3	47	66	45	55
	4 items	7.9	53.4	63.1	49	66	45	55

school or more (**Table 6.11**). In terms of learning outcomes, both parents' level of education appears to affect children's learning, but the relationship between mothers' education and children's learning is much stronger than that between father's education and learning.

Beyond the specific contribution of parents to children's schooling, learning outcomes may be influenced by the educational background of all adults living in the household. **Table 6.12** shows that in both grades, scores on both baseline and endline tests increase steadily as the number of educated adults in the household increases. However, the percentage point increase in scores over the period of one year is about the same for all children, regardless of where they started.

The home literacy environment

The tables above show that almost 40% of children in this sample came from homes where the father had never been to school; two thirds had mothers who had never been to school. The literacy environment in the households of sampled children reflects this situation. Out of a list that included calendars, religious texts, newspapers, magazines, and other books, about 40% of sampled children came from homes with none of these items, and another 40% from homes which were observed to have a single item – almost invariably a calendar. Print materials for children (story books or cards, alphabet or number charts, etc.) were also scarce, with about 20% of all children coming from households which had no literacy/numeracy material for children available other than the textbook.

As **Table 6.13** shows, more literacy materials at home does correlate with better attendance and learning outcomes, especially in Std 2.

Children whose home language is different from the school medium of instruction face enormous additional problems at school. Given the lack of

Table 6.11
Parents' educational background and children's learning

Indicator	Categories	% of all sample children	% students found present on all visits		Median test scores (%) – all children			
					Std 2		Std 4	
			Std 2	Std 4	Baseline	Endline	Baseline	Endline
Father	No schooling	38.5	41.7	46.4	36	55	33	42
	Less than primary completed	21.9	41.6	46.8	43	57	33	45
	Primary or higher	39.6	48.6	51.3	47	64	39	48
Mother	No schooling	66.3	43.3	48.1	38	53	33	42
	Less than primary completed	16.1	44.0	46.9	47	64	39	48
	Primary or higher	17.7	48.9	51.4	55	72	45	55

Table 6.12
Household size and children's learning

No. of HH residents with 5+ yrs of schooling	Median score: Std 2			Median score: Std 4		
	Baseline	Endline	Diff	Baseline	Endline	Diff
0	38	55	17	33	42	9
1–2	43	60	17	36	43	7
3–4	45	62	17	39	48	9

Table 6.13

Presence of print materials in household and children's learning and attendance

Indicator	No. of items observed	% of all sample children	% students found present on all 3 visits		Median test scores (%) – all children			
					Std 2		Std 4	
			Std 2	Std 4	Baseline	Endline	Baseline	Endline
No. of print materials in the HH	0	43.4	36.1	46.1	38	53	30	42
	1	41.0	46.1	57.4	45	62	39	48
	2+	15.6	45.7	57.7	47	64	39	48
No. of print materials for children in HH other than textbooks	0	19.3	31.5	48.3	38	60	30	45
	1	53.7	43.4	53.0	43	57	36	45
	2+	27.0	44.9	55.3	43	60	36	45

Table 6.14

Home/School language and children's learning and attendance

Indicator	Categories	% of all sample children	% students found present on all visits		Median test scores (%) – all children			
					Std 2		Std 4	
			Std 2	Std 4	Baseline	Endline	Baseline	Endline
Home lang/ school lang	Different	9.2	24.9	30.9	38	51	33	36
	Same	90.9	47.8	57.2	43	60	36	45

bridging mechanisms to enable a smooth transition from one language to the other, these children tend to attend school far less regularly. Whereas across both classes, about half of all children whose home language was the same as the school language were present in school on all three visits, this proportion is far lower among children whose home language was different from the school language (**Table 6.14**). Learning outcomes for these two groups of children are unequal to begin with and these differences accentuate over the course of one year, both in Std 2 and in Std 4.

What households do and its relationship with children's learning

Preschool attendance

Preschool attendance is acknowledged to be an important input into children's school readiness along a number of dimensions, including but not limited to cognitive development. Improved school readiness is thought to affect both retention and learning in early grades.

Data collected for this study included a simple indicator of whether or not each child had ever attended any type of preschool program prior to Std 1, classified into four options: government, private, other or none. We found that almost half of all sampled children had attended preschool. Of these, an overwhelming majority had attended a government preschool, except for Himachal Pradesh where 7.4% of sampled children had attended a private preschool program (**Table 6.15**).

Table 6.16 shows that in most states, children in our sample who had attended preschool had better primary school attendance than those who did not. In Himachal Pradesh, preschool attendance also correlates positively with learning levels for both Std 2 and Std 4 children, possibly reflecting the relatively high proportion of children in the sample who attended private preschools; but the

Table 6.15
Preschool attendance of sampled children, by state (%)

| State | % Sample children who | | | |
	Never attended preschool	Attended government preschool	Attended private/other preschool	Total
AS	49.1	49.8	1.1	100
AP	20.9	78.4	0.7	100
HP	48.0	44.7	7.3	100
JH	68.4	30.7	1.0	100
RJ	75.7	23.8	0.5	100
Total	**55.0**	**43.0**	**2.1**	**100**

Table 6.16
Preschool attendance and children's learning and attendance in school, by state

| State | Attended preschool? | % children found present on all three visits | | Median test scores (%) – all children | | | |
| | | | | Std 2 | | Std 4 | |
		Std 2	Std 4	Baseline	Endline	Baseline	Endline
AS	No	16.5	*	47	64	27	45
	Yes	20.7	*	43	64	27	45
AP	No	63.5	71.0	51	72	52	61
	Yes	69.9	72.1	53	70	58	64
HP	No	64.4	64.1	45	70	36	52
	Yes	72.1	72.0	55	74	45	55
JH	No	25.7	27.9	40	43	36	36
	Yes	26.7	31.2	34	40	33	30
RJ	No	44.5	52.9	32	45	33	36
	Yes	50.4	57.0	28	55	24	39
Total	**No**	**38.8**	**43.1**	**38**	**53**	**36**	**42**
	Yes	**51.2**	**53.8**	**45**	**64**	**39**	**52**

Attendance figures for Std 4 do not include Assam, where children move into a new school on completion of Std 4 and were therefore no longer enrolled in sampled schools during Visit 3 for this study.

improvement in learning outcomes over a year is actually lower among those who attended preschool. In the other four states, preschool attendance appears to have no relationship with learning levels.

These findings are perhaps not surprising given the fact that other than in Himachal Pradesh, virtually all children in the sample who had attended preschool went to government ICDS centres which do not implement school readiness activities; thus

it might be expected that subsequent impact would be related to attendance rather than to learning outcomes.

Academic support outside school

Almost two thirds of all children in this sample received some form of academic support outside school, both in Std 2 and in Std 4. Overall, in both grades, children who received this extra help were present in school more often and had higher baseline and endline scores

than those who did not. Moreover, Std 4 children who received extra help learned more during the intervening year between baseline and endline than did their counterparts who didn't have access to help outside of school (**Table 6.17**).

Who exactly provides this help, and are some types of support more effective than others?

Of those children in our sample who received help outside of school, close to 9 out of every 10 got help from one or more family members. Almost half reported getting help from one or more siblings, 36% from the father and 23% from the mother. Std 2 children were slightly more likely to receive help from a parent, whereas Std 4 children were slightly more likely to receive help from other sources. Overall, about 2 out of every 10 children took paid private tuition classes (**Table 6.18**).

In general, the involvement of either parent with children's schooling increases the likelihood of children attending more often and learning well, whereas the involvement of siblings has a mixed effect on attendance and appears to be have a *negative* impact on learning (**Table 6.19**).

Implications of these findings

The relationships observed in these data between household socioeconomic characteristics and children's learning come as no surprise. The relationship between paid tuition classes and learning outcomes is less

Paid private tuition is observed to have a strong negative relationship with children's attendance. Both in Std 2 and in Std 4, children who went to paid tuition classes were far less likely to have been found present in school on all three visits than those who did not. A possible explanation is that parents expect their children to learn more in paid classes than in school, and therefore insist less on regular school attendance. But the evidence from these data suggests that this expectation is far from true, especially for higher classes. Std 2 students who received tuition did slightly better on the baseline but exactly the same on the endline as their counterparts who did not receive tuition. And in Std 4, students attending paid tuition classes did *worse* on average than their counterparts who did not, on both baseline and endline tests, presumably because they attended school less often.

Table 6.17
Academic support outside school and children's learning and attendance

Indicator	Categories	% of all sample children	% students found present on all 3 visits		Median test scores (%) – all children			
					Std 2		Std 4	
			Std 2	Std 4	Baseline	Endline	Baseline	Endline
Academic support outside school?	No	37.7	42.3	45.6	36	51	33	39
	Yes	62.3	47.7	51.4	47	62	36	48

Table 6.18
Source of academic support (%)*

Source of help	Family				Other unpaid help			Paid tuition	
	Mother	Father	Sibling	Other family	Neighbour	NGO	Other	Teacher	Other
Std 2	24.6	38.6	38.7	12.6	3.3	0.8	1.6	2.2	15.9
Std 4	22.6	35.7	42.9	12.7	3.6	1.1	1.9	2.0	18.1

* Totals do not add up to 100 because many children received help from multiple sources.

Table 6.19
Source of academic support and children's learning and attendance

Source of support	Categories	% of all sample children	% students found present on all 3 visits		Median test scores (%) – all children			
					Std 2		Std 4	
			Std 2	Std 4	Baseline	Endline	Baseline	Endline
Mother	No	76.4	44.2	48.2	40	55	36	42
	Yes	23.6	53.5	56.1	55	72	42	55
Father	No	62.8	44.0	48.0	40	57	36	42
	Yes	37.2	50.8	53.8	49	66	39	52
Sibling	No	59.2	45.6	48.4	43	60	36	45
	Yes	40.8	45.6	51.8	40	57	33	45
Paid tuition	No	81.0	50.7	55.3	45	62	39	48
	Yes	19.0	34.3	35.8	49	62	36	45

intuitive, but impossible to analyze further without additional information about the nature of these classes. But as school systems tackle the 'last mile' problem and attempt to reach the small proportion of children who continue to be out of school, the question of how best to support children who are first generation learners, especially those whose home language is different from the school's medium of instruction, becomes increasingly important.

These data provide some pointers towards the type of intervention needed to help children who start out with a 'home disadvantage'. Library programs that encourage children to take reading materials home, and language bridging mechanisms for children unfamiliar with the school language, are two mechanisms that could help. Sensitizing teachers to these issues and encouraging them to help all children learn, rather than to complete the required syllabus, is a key part of the solution.

SOCIAL EQUITY | 7

Summary

Information on selected social, economic and demographic characteristics of children was recorded during field visits, both from schools and households. This chapter examines the relationship between these factors and children's learning outcomes and attendance.

Information on sensitive issues such as social category was both difficult to obtain and to verify; in many instances, school records and household information did not coincide. Further, it is evident that the influence of social category and religion is state-, district- and even locality-specific.

Gender

▲ No relationship was found between gender and children's attendance or learning levels for the Std 2 and Std 4 children in the sample.

▲ Older girls in the 10–14 year age group were more likely to participate in domestic work than boys in this age group. However, this did not appear to impact either their school attendance or their learning outcomes.

Social Category

▲ Although children from the general social category formed the smallest sub-group in the sample, their attendance was higher than that of children belonging to other social categories. However, this relationship varied substantially by state.

Religion

▲ Attendance and test scores were lower for children from Muslim families than for children from other religious backgrounds.

▲ However, *improvement* in learning levels over a year was equal for Hindu and Muslim children. The sample included too few children with other religious affiliations to be able to make meaningful comparisons.

Introduction

Does enrollment in school ensure equitable opportunities to learn? Given that the multiple and interrelated social fragmentations across gender, caste, religion and language permeate all aspects of social and economic life, it is important to assess how these factors play out with respect to children's attendance and learning outcomes.

In this chapter, we look at selected demographic characteristics of the sampled children in our study and how these relate to learning outcomes. The characteristics covered are gender, social category, and religion.

Gender

Social norms on appropriate gender behavior influence the lives of girls and boys differently, resulting in (for example) different patterns of education and time use. Research on gender and education suggests that girls' education is often constrained by their involvement in household and domestic activities from a very early age.

A very high proportion of sampled children were reported to participate routinely in domestic work, with a clear gender difference visible even among younger children. The gender gap in participation in domestic work widens steadily from 2% among 5–6 year olds to 10% among 12–14 year olds **(Table 7.1)**.

Table 7.1
Participation of sample children in domestic work, by age category (%)

Age group	Boys	Girls
5–6 years old	40.7	42.4
7–9 years old	46.6	50.7
10–11 years old	45.8	57.9
12–14 years old	50.0	59.7
All sampled children	**46.0**	**51.0**

How do differences such as these play out in school? In this section we examine whether patterns in enrollment, attendance and learning outcomes vary by gender.

Enrollment patterns by gender

The sample distribution of children by gender reveals that overall, equal proportions of girls and boys are enrolled in Std 2 and Std 4 across the schools surveyed for this report, with some variations across states (**Table 7.2**).

- Across states in the sample, Andhra Pradesh has the highest proportion of girls in government school, in both Std 2 and Std 4 (55%).

- In general, the proportion of boys to girls remains fairly stable from lower to upper primary classes. Exceptions are Rajasthan, where the proportion of enrolled boys increases between Std 2 and Std 4; and Jharkhand, where the proportion of boys decreases between Std 2 and Std 4.

Trends in attendance and learning outcomes by gender

As part of this study, the attendance of each sampled child was checked by physical headcount on each of three visits to the school spanning approximately one year. As **Table 7.3** shows, girls were slightly more likely than boys to have been present on all three visits to the school, both in Std 2 and in Std 4. However, there is no evidence that learning outcomes vary systematically by gender. In Std 2, girls have higher initial learning levels but make less progress over the course of one year, whereas in Std 4, exactly the opposite pattern is visible.

Given that the present study is restricted to children in Std 2 and Std 4, it is likely that the relationship between gender and enrollment, attendance and learning outcomes may become visible in later years as children progress through higher classes and social norms restricting girls' mobility, social interactions, and educational aspirations come into play.

Table 7.2

Gender distribution of sampled students, by state (%)

State	Std 2			Std 4		
	% boys	% girls	Total	% boys	% girls	Total
Andhra Pradesh	45.4	54.6	100	45.3	54.7	100
Assam	50.4	49.6	100	49.9	50.1	100
Himachal Pradesh	51.5	48.6	100	51.5	48.6	100
Jharkhand	50.3	49.7	100	47.5	52.5	100
Rajasthan	52.2	47.8	100	54.2	45.8	100
Total	**50.1**	**49.9**	**100**	**49.7**	**50.3**	**100**

Table 7.3

Attendance and learning outcomes of sampled children, by gender

Gender	% students found present on all 3 visits		Median test scores – all children					
			Std 2			Std 4		
	Std 2	Std 4*	Baseline	Endline	*Change*	Baseline	Endline	*Change*
Boys	40.9	52.9	40	60	*20*	36	45	*9*
Girls	42.4	53.2	43	57	*14*	33	45	*12*

* Attendance figures for Std 4 do not include Assam, where children move into a new school on completion of Std 4 and were therefore no longer enrolled in sampled schools during Visit 3 for this study.

Social category

Across different sectors and spheres of activity, divisions across caste and ethnic lines have led to substantial inequalities in access to services and amenities. With this in mind, it is important to assess whether patterns in school enrollment, attendance and learning outcomes vary across social categories.

Note on data: During Visit 1, data on social category of the children in our sample was collected from schools, with the exception of Assam, where schools do not record this information. During Visit 2, the same information was collected from children's families via a household survey. The household data had a very high no response rate to this question, and where responses were received these frequently did not match school records. The data presented in this section uses social category data collected from school records and therefore excludes Assam.

Enrollment patterns by social category

Overall, children from Other Backward Castes form a majority among children sampled for this study, at almost half of the total sample size for both classes. A little over one-fifth of all children in both Std 2 and Std 4 were found to be from the Scheduled Caste category, forming the next biggest sub group in the sample. Scheduled Tribe and General category children make up the remaining distribution. The distribution of children across social categories is very similar in Std 2 and in Std 4, but varies substantially across states **(Table 7.4)**.

- Children from Other Backward Castes are in a majority in Andhra Pradesh (65%) and Jharkhand (60%).

- Himachal Pradesh (40%) and Andhra Pradesh (33%) have the highest proportion of Scheduled Caste children in the sample. Fairly large proportions of Scheduled Tribe

Table 7.4

Sample children belonging to different social categories, by state (%)

Social category	% Std 2 children who were recorded as						% Std 4 children who were recorded as					
	GEN	SC	ST	OBC	Other	Total	GEN	SC	ST	OBC	Other	Total
AP	1.5	34.3	0.0	64.3	0.0	100	1.4	32.6	0.0	65.8	0.2	100
HP	39.9	39.5	7.5	13.1	0.0	100	42.3	38.6	6.9	12.2	0.0	100
JH	3.3	9.7	26.0	60.9	0.2	100	3.6	10.2	22.8	63.3	0.1	100
RJ	7.3	13.7	31.5	47.3	0.2	100	7.3	13.7	31.2	47.8	0.1	100
Total	**11.6**	**21.9**	**18.5**	**48.0**	**0.1**	**100**	**13.2**	**22.8**	**16.0**	**48.0**	**0.1**	**100**

Table 7.5

Attendance and learning by social category

Social category	Proportion in the overall sample	% students found present on all 3 visits		Median test scores – all children					
				Std 2			Std 4		
		Std 2	Std 4	Baseline	Endline	*Change*	Baseline	Endline	*Change*
General	12.4	60.4	64.3	51.0	70.0	*19.0*	42.0	52.0	*10.0*
SC	22.4	54.9	60.4	43.0	64.0	*21.0*	39.0	52.0	*13.0*
ST	17.2	36.6	42.1	32.0	43.0	*11.0*	30.0	36.0	*6.0*
OBC	48.0	44.5	49.6	43.0	57.0	*14.0*	39.0	45.0	*6.0*

children are located in Rajasthan (30%) and Jharkhand (25%).

▲ Himachal Pradesh has the largest proportion of children from the General category (40%).

Trends in attendance and learning by social category

Although children from General category represent the smallest sub-group in the sample, these children were the most likely to be in school on all three visits, followed closely by children from the Scheduled Caste category. A much smaller proportion of children from Other Backward Castes and Schedule Tribe backgrounds were found present on all three of our school visits **(Table 7.5)**.

Learning outcomes appear to reflect this difference in attendance. In both Std 2 and 4, the percentage point improvement over a period of one year is highest among General and Scheduled Caste students and substantially lower for Scheduled Tribe and OBC students.

However, these overall trends hide enormous variations across the states in our sample **(Tables 7.6–7.9)**. For example, in Andhra Pradesh, while OBC students were found to attend school more regularly than Scheduled Caste students, the learning outcomes of both groups are comparable and similar across both classes. In Himachal Pradesh, Scheduled Caste students have the highest attendance and also made the best progress over the course of one year. The situation of Rajasthan is completely different, where the relationship between social category, attendance and learning gains are inconsistent and difficult to interpret. As these data suggest, issues of social category are embedded in their own contextual and highly location-specific realities. However, given that in general there is a clear relationship between attendance and learning, it is very important to take a closer look at the factors that impede or encourage children to attend school regularly.

Table 7.6
Attendance and learning by social category (Andhra Pradesh)

AP	Proportion in the overall sample	% students found present on all 3 visits		Median test scores – all children					
				Std 2			Std 4		
		Std 2	Std 4	Baseline	Endline	*Change*	Baseline	Endline	*Change*
SC	33.4	61.0	64.7	51.0	70.0	*19.0*	48.0	64.0	*16.0*
OBC	65.1	64.9	71.3	53.0	70.0	*17.0*	48.0	64.0	*16.0*

Table 7.7
Attendance and learning by social category (Himachal Pradesh)

HP	Proportion in the overall sample	% students found present on all 3 visits		Median test scores – all children					
				Std 2			Std 4		
		Std 2	Std 4	Baseline	Endline	*Change*	Baseline	Endline	*Change*
General	41.2	68.3	69.3	55.0	74.0	*19.0*	42.0	55.0	*13.0*
SC	39.0	72.8	72.8	47.0	70.0	*23.0*	39.0	55.0	*16.0*
ST	7.2	48.6	38.6	51.0	72.0	*21.0*	33.0	45.0	*12.0*
OBC	12.6	68.6	71.4	51.0	64.0	*13.0*	45.0	48.0	*3.0*

Table 7.8
Attendance and learning by social category (Jharkhand)

JH	Proportion in the overall sample	% students found present on all 3 visits		Median test scores – all children					
				Std 2			Std 4		
		Std 2	Std 4	Baseline	Endline	*Change*	Baseline	Endline	*Change*
SC	9.9	19.1	21.1	32.0	32.0	*0.0*	33.0	24.0	*-9.0*
ST	24.5	26.9	31.4	32.0	36.0	*4.0*	30.0	27.0	*-3.0*
OBC	62.0	25.2	27.9	43.0	45.0	*2.0*	36.0	36.0	*0.0*

Table 7.9
Attendance and learning by social category (Rajasthan)

RJ	Proportion in the overall sample	% students found present on all 3 visits		Median test scores – all children					
				Std 2			Std 4		
		Std 2	Std 4	Baseline	Endline	*Change*	Baseline	Endline	*Change*
General	7.3	42.1	54.3	34.0	32.0	*-2.0*	30.0	36.0	*6.0*
SC	13.7	34.3	51.7	28.0	43.0	*15.0*	33.0	36.0	*3.0*
ST	31.4	43.4	52.2	30.0	43.0	*13.0*	27.0	36.0	*9.0*
OBC	47.6	47.3	51.3	32.0	51.0	*19.0*	30.0	37.5	*7.5*

Religion

Religious divisions in India have also come to be associated with differentiated economic conditions and access to services and amenities. Various research papers on the subject have called for the Government to pay special attention to this area and implement measures to counter the current inequities that children hand their families face.[1]

Enrollment patterns by religious affiliation

Table 7.10 presents the overall distribution of sampled children in Std 2 and Std 4 by state and religious affiliation. Across both classes, over 80% of the sample children are Hindus; Muslim students comprise about 16% of the sample and students from other religious categories (mainly Sikh and Christian) comprise 2%. With the exception of Assam, where half of the sample

children are reported as being Muslim, this pattern holds true for all states.

Trends in attendance and learning outcomes by religious affiliation

Attendance data for the sample as a whole show substantial differences between children from Muslim families and those from other religious backgrounds **(Table 7.11)**. Both in Std 2 and Std 4, Muslim children were far less likely to have been present on all three visits to the school than were children from families with other religious affiliations. This difference in attendance patterns is reflected in lower baseline and endline scores, although the percentage point increase in scores between baseline and endline is identical for Hindu and Muslim children.

When analyzed at the level of individual states, however, it is clear that this overall trend does not

Table 7.10
Religious affiliation of sampled children, by state (%)

Std 2	% children who are				Std 4	% children who are			
	Hindu	Muslim	Other	Total		Hindu	Muslim	Other	Total
AS	47.7	50.1	2.2	100	AS	47.8	50.9	1.3	100
AP	87.2	7.6	5.2	100	AP	88.9	6.7	4.4	100
HP	94.3	5.5	0.2	100	HP	93.6	5.8	0.6	100
JH	78.8	18.3	3.0	100	JH	79.4	17.7	2.9	100
RJ	91.2	8.7	0.1	100	RJ	90.6	9.4	0.0	100
Total	**81.0**	**17.1**	**2.0**	**100**	**Total**	**82.6**	**15.6**	**1.8**	**100**

Table 7.11
Attendance and median baseline and endline test scores by religious affiliation

Religious Category	% of children in overall sample	% students found present on all 3 visits		Median test scores – all children					
				Std 2			Std 4		
		Std 2	Std 4*	Baseline	Endline	*Change*	Baseline	Endline	*Change*
Hindu	81.7	47.8	56.2	43.0	60.0	*17.0*	36.0	45.0	*9.0*
Muslim	16.4	28.7	38.8	40.0	57.0	*17.0*	30.0	39.0	*9.0*
Other	1.9	47.9	56.2	47.0	63.0	*16.0*	42.0	55.0	*13.0*

* Attendance figures for Std 4 do not include Assam, where children move into a new school on completion of Std 4 and were therefore no longer enrolled in sampled schools during Visit 3 for this study.

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1   For example, the report of the Government appointed Sachar Committee (2006) titled 'Social, Economic and Educational Status of the Muslim Community of India' analyses the status of education of the Muslim community and recommends that special measures need to be taken by the Government in this regard.

necessarily hold. **Tables 7.12–7.16** provide a state wise breakup of attendance and learning data for Hindu and Muslim children.[2] In Assam, for example, where Muslim children are the majority, their attendance pattern is better (although still extremely low), but the difference is slight and does not translate into better learning outcomes. The same applies to Std 4 students in Himachal Pradesh. In Rajasthan in Std 2, Muslim children attend slightly more often and make more progress during a year, whereas in Std 4 the opposite trend is visible. In Andhra Pradesh, Muslim students do slightly better than Hindu students despite having marginally poorer attendance. And in Jharkhand there is no discernable relationship between religion, attendance and learning outcomes which are very low for all children.

As in the case of social category, these data suggest that the relationship between religious affiliation, attendance and learning is complex and needs to be analyzed in a much deeper context than is possible in the present study.

Table 7.12
Attendance and learning by religion (Assam)

AS	% of children in overall sample	% students found present on all 3 visits		Median test scores – all children					
				Std 2			Std 4		
		Std 2	Std 4	Baseline	Endline	*Change*	Baseline	Endline	*Change*
Hindu	47.8	17.9	*	47.0	68.0	*21.0*	30.0	48.0	*18.0*
Muslim	50.5	19.0		43.0	62.0	*19.0*	24.0	42.0	*18.0*

* Attendance figures for Std 4 do not include Assam, where children move into a new school on completion of Std 4 and were therefore no longer enrolled in sampled schools during Visit 3 for this study.

Table 7.13
Attendance and learning by religion (Andhra Pradesh)

AP	% of children in overall sample	% students found present on all 3 visits		Median test scores – all children					
				Std 2			Std 4		
		Std 2	Std 4	Baseline	Endline	*Change*	Baseline	Endline	*Change*
Hindu	88.1	69.0	72.3	53.0	70.0	*17.0*	48.0	64.0	*16.0*
Muslim	7.1	66.1	66.4	57.0	77.0	*20.0*	45.0	64.0	*19.0*

Table 7.14
Attendance and learning by religion (Himachal Pradesh)

HP	% of children in overall sample	% students found present on all 3 visits		Median test scores – all children					
				Std 2			Std 4		
		Std 2	Std 4	Baseline	Endline	*Change*	Baseline	Endline	*Change*
Hindu	94.0	69.0	68.5	51.0	72.0	*21.0*	42.0	55.0	*13.0*
Muslim	5.6	65.7	71.7	41.5	64.0	*22.5*	33.0	45.0	*12.0*

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2   Children from other religious backgrounds are not included in these tables because the sample size is too small to make meaningful comparisons.

Table 7.15
Attendance and learning by religion (Jharkhand)

JH	% of children in overall sample	% students found present on all 3 visits		Median test scores – all children					
				Std 2			Std 4		
		Std 2	Std 4	Baseline	Endline	Change	Baseline	Endline	Change
Hindu	79.1	27.4	31.0	38.0	43.0	5.0	36.0	33.0	-3.0
Muslim	18.0	16.9	15.5	40.0	40.0	0.0	36.0	30.0	-6.0

Table 7.16
Attendance and learning by religion (Rajasthan)

RJ	% of children in overall sample	% students found present on all 3 visits		Median test scores – all children					
				Std 2			Std 4		
		Std 2	Std 4	Baseline	Endline	Change	Baseline	Endline	Change
Hindu	90.9	45.0	54.0	32.0	47.0	15.0	30.0	39.0	9.0
Muslim	9.0	51.0	49.5	26.0	45.0	19.0	30.0	31.5	1.5

LOOKING AHEAD: NEW DIRECTIONS FOR POLICY AND RESEARCH | 8

The challenge

The Right of Children to Free and Compulsory Education Act (2009) mandates that every child in India must receive eight years of education. In the spirit of the RTE Act, 'education' refers not only to access to schooling, but also to *learning* for all.

With this mandate in mind, how far have we come, and what key challenges remain? During the last decade India has made impressive progress towards universalizing access to elementary education. According to all available statistics, today over 95% of children in the elementary school age group are enrolled in school.[1] This is no mean achievement given the size and diversity of the country. Substantial progress has been made with respect to provisioning in terms of buildings, classrooms, teachers, textbooks and other facilities.

Now that children are in school, the question is: are they learning? The answer that emerges from this study,

as well as from the government's periodic assessments and other data like ASER or Educational Initiatives, is that a great deal of work remains to be done with respect to children's learning.[2] For example, ASER 2010 shows that close to 50% of children in India in Grade 5 cannot read Grade 2 level text. The figures for arithmetic are even more disheartening. Further, according to the annual data produced by ASER, the all India numbers for basic reading and arithmetic have not changed at all in the last six years. Enrollments are high, but learning levels are low and "stuck".

The big challenge for India and for many other countries is to move from ensuring schooling to guaranteeing learning for all children.

What helps children learn? What kind of schools? What kind of classrooms? What kind of teachers and teaching enables student learning outcomes to improve? What are the influences at home that support effective learning? Empirical evidence on educational inputs is available, and increasingly there is evidence

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1   The Government of India reports a Net Enrollment Ratio (NER) of 98.3% for 2009–10. According to ASER 2010, 96.5% of all children in the 6–14 year age group are enrolled in school.

2   See for example: Sarva Shiksha Abhiyan (January 2011): Thirteenth Joint Review Mission. Available at: http://ssa.nic.in; Pratham Resource Centre (2005–2010): Annual Status of Education Report, available at: www.asercentre.org; Educational Initiatives (2007), Municipal School Benchmarking Study 2007, available at: http://www.ei-india.com/wpcontent/uploads/eI_WP_series_6__Municipal_school_Benchmarking_study.pdf.

on outcomes as well. But large scale studies that look carefully at the process of schooling are relatively rare in India. The current study provides a unique opportunity in that it focused on children and learning, teachers and teaching while at the same time covering a large and diverse cohort of close to 30,000 children from five very different states and tracking their progress over the course of a year.

This chapter attempts to summarize our learnings from this study. We begin with a review of the data on who these children are and how much they learn during the course of one year in school. We then pull together the findings on different aspects of schools and schooling that correlate with better learning outcomes and outline some implications for policy and research. Finally, we present some concluding thoughts on how to guarantee learning and not just schooling for all children.

Who is in school?

Data from this study show that close to equal proportions of boys and girls are enrolled in Std 2 and Std 4. But children in each grade vary enormously across a number of key dimensions.

- *They vary in age.* Of the 15,001 Std 2 children sampled for this study, 69% are in the age-appropriate grade (assuming that they enter Std 1 at age 5 or 6). The remaining 31% range in age from 5 to 12. Of the 14,342 Std 4 children sampled, even fewer (63%) are in the age appropriate grade; the rest range in age from 5 to 14.[4]

- *They vary in ability level.* Of the 10,955 sampled Std 4 children for whom both baseline and endline assessment data is available, close to 20% had a score of 0 on the baseline language test; a further 27% scored less than 20%, and about 10% scored more than 60%. If "grade appropriate" learning levels are defined as a score of at least 60% on the baseline language test (a fairly low bar to set), then 27% of Std 2 children and 10% of Std 4 children were at grade level.

- *They vary in the availability of learning support outside school.* Across both grades, close to 10% of sampled children come from families whose home language is different from the school's medium of instruction. Only about 40% of them have at least one parent who has completed primary school. About half have any kind of literacy materials available at home.

In India, as elsewhere in the world, schools are based on certain long standing assumptions. For example if we think about a "Std 4", it conjures up an image of a room with a Std 4 teacher, children of roughly the same age who are enrolled in Std 4 and who are using Std 4 textbooks. All of these children would be moving a year at a time through the school system. The assumption stretches to the belief that if children are in Std 4, most of them would have successfully attained the learning expected of them the year before in Std 3.

The problem arises when these assumptions are taken to be true, because -as this study has shown- the reality is quite different. The notions of 'age-appropriate grade' and 'grade-appropriate learning levels' are constructs that underpin educational planning and policy making, but bear little resemblance to the situation on the ground in rural India.

How much do children learn during a year in primary school?

On average, Std 2 children in the sample for whom both baseline and endline learning outcomes are available scored 38% in the baseline language test (recall that only the most difficult questions on the test were actually at Std 2 level). A year later, a few months into Std 3, this figure had increased to 51%. There is no question that children do learn. But given that most competencies being tested were those contained in Std 1 textbooks, this average score should have been close to 100%. Most children were two grade levels behind.

A similar pattern is observed among Std 4 children, whose average language score improved from 29% in

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4   The age-grade distribution of students by state is included in Appendix 2.

the baseline to 38% in the endline test. However, the most difficult questions on the Std 4 test contained content covered in Std 3 textbooks. If most children had been at 'grade level' in terms of learning outcomes, the average score would have been much closer to 100% in the baseline itself. As in the case of the Std 2 results, most children were at least two grades levels behind.

The evidence from this study shows that children do learn over the course of a year. But they learn too little and too late. The process of falling behind begins early. Once behind, there are no mechanisms within the school system to help children catch up, and the gap between expectations and ability widens as they move into higher classes.

Although learning achievement in these grades shows no difference by gender, nor is a systematic relationship visible in these data between social characteristics such as social category and religion and learning outcomes, it is clear that children who are better supported at home do better than others. And children whose families cannot provide this support – those from poorer and less educated families, or families whose home language is different from the school's medium of instruction – do worse. It is worth remembering that more than 20% of the children in this sample are first generation learners: neither parent had ever been to school.

What can schools do to help children learn?

In many ways, the major findings from this study are no more than common sense. Children need to be *in* school in order to learn curriculum content. The school's resources (people, time and space) need to be organized in ways that best facilitate children's learning. There needs to be a reasonably paced curriculum and appropriate textbooks and other teaching-learning material. Teachers must have content knowledge, the ability to explain content, and the ability to make children in their classroom feel welcome and valued. Given the context of Indian schools, they must also be able to deal with groups of students who are very

diverse in terms of age, grade, and learning ability. And finally, if learning is to be brought centre stage within the system, then periodic learning assessments must be designed to inform teachers' practice as well as policy makers' decision making.

Participation in schooling – children and teachers

Across the 900 schools sampled for this study, an average of 65% of children enrolled in Std 1–5 were present on any given visit to the school. Across the 30,000 sampled students, four out of every ten Std 2 students and five out of every ten Std 4 students were observed to be present on all three visits. Regular attendance is strongly correlated with learning outcomes, especially in Std 4.

Across all schools, on average, 78% of all appointed teachers were present on any given visit. This proportion varies depending on how, when and where teachers' attendance is measured. But the mere presence of more teachers does not correlate with better learning outcomes.

Children who are regularly present in school learn more than those who are not. There is an urgent need to move the focus from tracking enrollment to understanding what it means to participate in school. This includes basic measurement of who is in school and for how long (attendance of teachers and children measured in different ways). It also includes a closer look at the factors that promote or impede better attendance, where they originate, and what can be done about them.

The figures for teachers' attendance generated from this study are very close to estimates from earlier research. But having more adults in school does not necessarily improve student learning: it is what these adults do in school that makes a difference. Thus, although tracking and understanding attendance patterns is a first step, more detailed research is required into who does what in school, how time is spent by teachers and students, and most of all, how much time in school is actually spent on teaching-learning.

point that teachers and others bring up is "then how will we complete the curriculum?"

The Right to Education Act requires that the curriculum be finished "within the specified time".[5] If this is interpreted to mean that textbooks must be 'covered' during the school year, and if textbooks continue to be written for an imaginary set of children rather than based on the reality of what children can do, then we can be sure that the teaching of textbooks will continue to be a major hindrance to children's learning.

Teachers and teaching capability

No relationship was observed between specific teacher characteristics (e.g. years of experience, gender, age, educational or professional qualifications) and student learning outcomes. But teachers' ability to teach, as measured by a simple 'teaching capability assessment', is correlated with higher student achievement.

Teachers' content knowledge is in many cases inadequate when compared against a Std 4 curriculum. Although simple "corrections" of basic competencies can be done well by most teachers, their ability to explain content is clearly easier to do for simpler concepts or operations than for those that have slightly higher levels of difficulty. Teachers are weakest when it comes to application of their knowledge/skill to a given situation where they have to take the initiative to generate something new (such as a meaningful summary or a problem for students to solve).

In addition, teachers' theoretical awareness of the importance of 'child friendly' classrooms does not translate into practice. In four out of every ten classrooms observed for this study, *none* of six very simple 'child friendly' indicators were observed.

This study provides a wealth of data about teachers and teaching, and some concrete evidence of the directions in which teachers' capability to teach needs to be built. Selecting candidates with the best possible academic

Curriculum and teaching-learning materials

Across the five states included in this sample, Std 2 and Std 4 textbooks vary in what they expect children to be able to do. But even in the best performing states, these expectations are far beyond what the majority of children can in fact do. Teaching-learning materials other than the textbooks were used in just one out of every ten classrooms observed.

Textbooks play a central role in Indian primary schools. In the classroom, all teaching and learning is anchored and guided by the grade-specific textbook. Across the children sampled for this study, almost every child had a textbook, which was often the only reading material available to them.

But textbooks' expectations of what children can do and should learn are completely unrealistic, as well as often quite arbitrary in terms of both content and sequencing. Thus the essential tasks of teaching and learning are fundamentally misaligned. As far as learning levels go, there is a diverse set of children in any group. And most of them are at levels far below what the teacher is trying to transact. Yet the textbook is sacrosanct within the school system; in any discussion about reform, the first

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5   *Right of Children to Free and Compulsory Education Act (2009),* Article 24(c).

qualifications does not automatically ensure that they know how to teach young children. The current nature of qualifications and usual types of teacher training are not sufficient to guarantee effective teaching. A much closer look is needed at what teachers know, what they are able to do and how they translate their own capabilities into practice.

The findings from this study indicate promising ways in which teacher preparation can be shaped. In the section on teachers and teaching we have tried to highlight the kinds of abilities and skills that teachers need to teach language and math in primary grades, but clearly do not have. Simple diagnostic tools such as the one used for this study should be the starting point for designing teacher training. These findings should be kept in mind in the context of massive teacher recruitment that is expected in the wake of the Right to Education Act.

Organization of the school's resources

Just over half of all schools in the sample had a timetable displayed in a place where anyone could consult it. Children in schools that had a timetable and were observed to be following it had higher mean scores than those in schools that had no timetable or were not following it.

Most teachers in the sample reported teaching multiple classes in the school. The lower the class, the more likely that it was taught by multiple teachers.

Across the sample, more than half of the 1,800 Std 2 and Std 4 classrooms visited had fewer than twenty students in all. In close to two thirds of all classrooms, these students were from two or more grades sitting together.

The organization of a school in terms of time, people and space can be an important element in ensuring a more productive learning environment. Even with their current resources, schools could be organized better; following a timetable is only one example. For example, do specific grades have specific teachers who are assigned to them? Do these teachers teach the class for the whole year? If grades have to be grouped

together, are these groupings stable over time? While these may seem like administrative decisions, it is likely that stable groupings of teachers and grades will benefit children's learning.

The fact that two thirds of all classrooms are multigrade has serious implications for the organization of people and time within a school. Students within each grade already vary considerably in terms of age, learning levels, and home support, as described earlier in this chapter. Multigrade classroom situations introduce even more complexity to the teacher's task, since in addition to dealing with variations in age and ability she must also cover content prescribed for each grade separately. One way to deal with this situation is to provide appropriate training to teachers to equip them to handle multiple grades at the same time. Another option is to break away from the traditional grouping of students by grade for all or part of each school day, and group children by learning level instead. Given that in every grade there are children at different levels in terms of basic language and math abilities, this strategy would allow teachers to deal with groups of students that are homogenous at least along one dimension – learning levels – and utilize materials and methods appropriate to help them master the appropriate learning goals.

Learning assessments

In response to a question about which children face the most difficulties with learning, most responding teachers felt that children with illiterate parents are those who face the most difficulties in school. But at the same time, most of these teachers also felt that the school provided sufficient support to students who are falling behind, and that lack of parental support was the biggest problem in ensuring that all children learn well.

In a system where children are automatically promoted from one grade to the next, teachers are expected to complete the curriculum regardless of whether their students have understood the content, and learning assessments are designed and used only

to report information 'upward' within the system, teachers have no incentive to understand what their children can and cannot do and modify their practice accordingly.

This study did not collect information on how teachers currently assess students' learning outcomes or how/whether these assessments feed back into what they do in the classroom. But the data presented on teachers' opinions suggest that teachers do not see it as their responsibility to ensure that children learn. Similar conclusions have been reached by other studies using very different methodologies.

Teachers need to see their job as ensuring that children learn, rather than ensuring that the textbook gets completed. But in order for teachers to do so, this focus on outcomes must be reflected at all levels of the school system. Simple ways can be devised (as have been done in this study) to assess both learning outcomes and classroom practice. Widespread use of such measurement can uncover pockets of "good practice" that can provide useful demonstrations of how to teach. Closer observation of "good practice" classrooms can help other teachers to modify their own classroom strategies, academic support personnel to understand what to look for and how to get there, and at the same time help educational planners and policy makers understand the difficulties of translating policy into practice.

Assessment is a fundamental requirement for better outcomes, and the emphasis of the Right to Education Act on continuous and comprehensive evaluation is very welcome. However, the purpose behind learning assessments should be to evaluate the performance of schools, not of the children who study in them. If we begin with the assumption that all children can learn, then mechanisms for assessment should be designed to focus attention on the question of what schools can do differently to help children learn better. Only then will assessments translate into better learning.

In conclusion: Guaranteeing learning in the context of RTE

The present study has provided a close look at schools and classrooms, teachers and children. It is essential that we reflect on the realities of the world in which schools operate, teachers teach and children learn. A deeper understanding of these realities is the only way to build a system that will guarantee meaningful education for all.

The passing of the Right of Children to Free and Compulsory Education Act (2009) provides a new policy context and a new series of opportunities to organize schools differently. While further research is clearly needed – some possible directions have been outlined above – this study has provided a host of insights about influences on teaching and learning that can help align policy with what children need in order to learn well. As new provisions are put into place for teacher recruitment and training, student assessment and tracking, textbook content, and so on, we hope that these ideas will be debated vigorously and tested in practice.

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Appendix 1: Note on sample design

This study used a two stage sample design, with stratification in the first stage.

In the first stage, 60 government schools with primary grades were sampled in each district.[1] The sampling frame used was the latest available DISE list of government schools for the district. This included both primary schools (classes 1–4/5) and upper primary schools (classes 1–7/8). Since there was considerable variation in enrollment, sampling was done using probability proportional to size (PPS) on total enrollment in Grades 1–5.

In the second stage, 25 children were proposed to be sampled from the enrollment registers of grades 2 and 4 in each of the sampled schools, in order to give us a sample of 50 children per school and 3,000 children per district. The overall targeted sample for 15 districts was, therefore, 45,000 children. However, often smaller schools, especially in Himachal Pradesh, had fewer than 25 children enrolled in the targeted grades. When fewer than 25 children were enrolled in a given grade, investigators were asked to include all children enrolled in the concerned grade. The final sample turned out to be close to 30,000 children.

Testing of children was done in the school if they were present on the day(s) of the survey. If a sampled child was not present, field investigators were asked to locate the child in the village and test the child at home or in the community.

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1   States and districts were purposively selected by representatives from MHRD, UNICEF, UNESCO and ASER Centre. In some cases, state SSA officials also participated.

Appendix 2: Sample description

Table 1
Children

State	District	Schools	Households	All children					Std 2 children					Std 4 children				
				Boys	Girls	Total*	Tested in baseline	Tested in endline	Boys	Girls	Total*	Tested in baseline	Tested in endline	Boys	Girls	Total*	Tested in baseline	Tested in endline
Assam	Cachar	60	1360	1186	1123	2460	2460	1760	587	596	1261	1261	908	599	527	1199	1199	852
	Dhubri	60	1183	1355	1426	2801	2801	1451	709	724	1441	1441	808	646	702	1360	1360	643
	Dibrugarh	60	782	788	760	1618	1618	1293	400	374	813	813	652	388	386	805	805	641
	Total	**180**	**3325**	**3329**	**3309**	**6879**	**6879**	**4504**	**1696**	**1694**	**3515**	**3515**	**2368**	**1633**	**1615**	**3364**	**3364**	**2136**
Andhra Pradesh	Cuddapah	60	994	580	629	1210	630	882	296	310	606	606	444	284	319	604	24	438
	Medak	60	1636	956	1074	2073	2073	1685	483	518	1023	1023	813	473	556	1050	1050	872
	Prakasham	60	1234	841	974	1816	1816	1239	398	521	919	919	599	443	453	897	897	640
	Total	**180**	**3864**	**2377**	**2677**	**5099**	**5099**	**3806**	**1177**	**1349**	**2548**	**2548**	**1856**	**1200**	**1328**	**2551**	**2551**	**1950**
Himachal Pradesh	Chamba	60	1214	741	677	1426	1426	682	361	328	690	690	650	380	349	736	736	32
	Mandi	60	1148	711	627	1341	1341	1247	330	300	631	631	581	381	327	710	710	666
	Sirmaur	60	1302	785	780	1572	1572	1497	371	362	737	737	697	414	418	835	835	800
	Total	**180**	**3664**	**2237**	**2084**	**4339**	**4339**	**4072**	**1062**	**990**	**2058**	**2058**	**1928**	**1175**	**1094**	**2281**	**2281**	**2144**
Jharkhand	Deoghar	60	2000	1223	1149	2392	2392	2001	632	572	1215	1215	1058	591	577	1177	1177	943
	Giridih	60	2079	1169	1207	2380	2380	1549	616	627	1244	1244	819	553	580	1136	1136	730
	Ranchi	60	1827	1075	1166	2246	2246	1828	555	577	1136	1136	943	520	589	1110	1110	885
	Total	**180**	**5906**	**3467**	**3522**	**7018**	**7018**	**5378**	**1803**	**1776**	**3595**	**3595**	**2820**	**1664**	**1746**	**3423**	**3423**	**2558**
Rajasthan	Ajmer	60	1906	1204	1039	2286	2286	1982	646	578	1245	1245	1088	558	461	1041	1041	894
	Banswara	60	1575	1014	910	1934	1934	1514	542	496	1045	1045	809	472	414	889	889	705
	Jodhpur**	58	1269	897	814	1788	1788	1276	486	438	995	995	707	411	376	793	793	569
	Total	**178**	**4750**	**3115**	**2763**	**6008**	**6008**	**4772**	**1674**	**1512**	**3285**	**3285**	**2604**	**1441**	**1251**	**2723**	**2723**	**2168**
	Total	**898**	**21509**	**14525**	**14355**	**29343**	**29343**	**22532**	**7412**	**7321**	**15001**	**15001**	**11576**	**7113**	**7034**	**14342**	**14342**	**10956**

*Numbers do not always add to the total due to missing data.

** In Jodhpur district, 2 schools were closed during the baseline visit and were therefore dropped from the sample.

Table 2

Age distribution of sampled children, by state (%)

Std 2

State	Age (years)								Total
	5	6	7	8	9	10	11	12 +	
AP	0.9	28.7	56.5	10.0	3.9				100
AS	0.2	4.7	63.7	17.2	14.1				100
HP	0.0	30.4	55.5	10.3	3.9				100
JH	0.2	12.9	42.7	33.4	10.9				100
RJ	3.0	20.8	41.1	22.8	12.3				100
Total	**0.9**	**18.5**	**50.8**	**20.2**	**9.6**				**100**

Std 4

State	Age (years)								Total
	5	6	7	8	9	10	11	12 +	
AP	1.4			15.9	65.9	13.4	2.4	3.4	100
AS	6.8			7.2	57.2	26.5	1.6	2.4	100
HP	0.3			30.3	57.3	9.0	1.8	3.2	100
JH	1.0			5.4	26.8	41.1	17.9	25.9	100
RJ	4.0			20.2	38.5	21.4	9.3	16.0	100
Total	**2.6**			**15.4**	**47.7**	**23.2**	**7.2**	**11.1**	**100**

Table 3
Schools

State	District	Schools			Teachers appointed			Teachers tested
		Total*	Primary schools	Upper primary schools	Total*	Primary schools	Upper primary schools	
AS	Cachar	60	40	19	171	95	74	53
	Dhubri	60	53	6	193	172	21	88
	Dibrugarh	60	42	18	216	130	86	76
	Total	**180**	**135**	**43**	**580**	**397**	**181**	**217**
AP	Cuddapah	60	51	9	191	50	51	159
	Medak	60	45	15	277	155	122	167
	Prakasham	60	49	11	227	155	72	175
	Total	**180**	**145**	**35**	**695**	**360**	**245**	**501**
HP	Chamba	60	60	0	183	183	0	110
	Mandi	60	60	0	187	187	0	125
	Sirmaur	60	56	3	215	191	21	111
	Total	**180**	**176**	**3**	**585**	**561**	**21**	**346**
JH	Deoghar	60	30	30	265	78	187	151
	Giridih	60	24	35	238	52	184	126
	Ranchi	60	33	27	266	64	202	140
	Total	**180**	**87**	**92**	**769**	**194**	**573**	**417**
RJ	Ajmer	60	30	30	341	121	220	162
	Banswara	60	43	17	215	106	109	102
	Jodhpur**	58	35	22	202	83	118	85
	Total	**178**	**108**	**69**	**758**	**310**	**447**	**349**
Total		**898**	**651**	**242**	**3387**	**1822**	**1467**	**1830**

* Numbers do not always add to the total due to missing data.

** In Jodhpur district, 2 schools were closed during the baseline visit and were therefore dropped from the sample.

Table 4
School facilities (%)

State	District	No. of schools visited	1 classroom per teacher	Time table			Library books			MDM served	Toilets			Girls toilet			Drinking water			Boundary wall available
				Not available	Available but not followed	Available and being followed	Not available	Available but not usable	Available and usable		Not available	Available but not usable	Available and usable	Not available	Available and locked	Available and unlocked	Not available	Available but not usable	Available and usable	
AS	Cachar	60	75.0	73.3	0.0	26.7	75.9	14.8	9.3	68.6	41.5	26.4	32.1	52.7	29.1	18.2	52.6	21.1	26.3	11.9
	Dhubri	60	65.0	66.7	19.1	14.3	59.7	35.1	5.3	68.3	17.9	58.9	23.2	75.9	17.2	6.9	19.3	10.5	70.2	7.3
	Dibrugarh	60	66.7	43.6	12.8	43.6	32.8	53.5	13.8	57.1	20.3	18.6	61.0	55.9	22.0	22.0	5.0	3.3	91.7	10.2
	Total	**180**	**68.9**	**61.9**	**10.3**	**27.8**	**55.6**	**34.9**	**9.5**	**64.5**	**26.2**	**34.5**	**39.3**	**61.6**	**22.7**	**15.7**	**25.3**	**11.5**	**63.2**	**9.8**
AP	Cuddapah	60	85.0	48.0	20.0	32.0	5.5	23.6	70.9	98.3	36.5	32.7	30.8	67.9	12.5	19.6	30.4	25.0	44.6	37.3
	Medak	60	56.7	16.0	20.0	64.0	5.8	48.1	46.2	100.0	42.1	22.8	35.1	51.8	19.6	28.6	36.8	10.5	52.6	38.3
	Prakasham	60	71.7	20.0	2.2	77.8	20.3	10.2	69.5	98.3	16.7	28.3	55.0	32.2	42.4	25.4	27.1	11.9	61.0	25.4
	Total	**180**	**71.1**	**30.8**	**13.3**	**55.8**	**10.8**	**26.5**	**62.7**	**98.9**	**31.4**	**27.8**	**40.8**	**50.3**	**25.2**	**24.6**	**31.4**	**15.7**	**52.9**	**33.7**
HP	Chamba	60	83.3	84.6	3.9	11.5	21.1	54.4	24.6	98.3	36.2	8.6	55.2	75.9	13.8	10.3	21.7	3.3	75.0	20.7
	Mandi	60	85.0	59.2	6.1	34.7	3.6	87.5	8.9	100.0	52.5	6.8	40.7	62.1	12.1	25.9	13.3	0.0	86.7	15.0
	Sirmaur	60	86.7	61.7	12.8	25.5	10.5	54.4	35.1	98.3	20.7	10.3	69.0	41.4	13.8	44.8	23.7	1.7	74.6	25.4
	Total	**180**	**85.0**	**68.9**	**7.4**	**23.7**	**11.8**	**65.3**	**22.9**	**98.9**	**36.6**	**8.6**	**54.9**	**59.8**	**13.2**	**27.0**	**19.6**	**1.7**	**78.8**	**20.3**
JH	Deoghar	60	75.0	83.7	7.0	9.3	58.9	33.9	7.1	79.0	63.8	10.3	25.9	67.8	17.0	15.3	28.1	1.8	70.2	5.1
	Giridih	60	68.3	74.4	7.0	18.6	33.3	63.3	3.3	36.2	65.0	10.0	25.0	68.3	16.7	15.0	30.5	11.9	57.6	10.2
	Ranchi	60	76.7	75.0	9.1	15.9	26.7	73.3	0.0	88.1	29.8	24.6	45.6	33.3	26.3	40.4	19.0	6.9	74.1	18.3
	Total	**180**	**73.3**	**77.7**	**7.7**	**14.6**	**39.2**	**57.4**	**3.4**	**67.8**	**53.1**	**14.9**	**32.0**	**56.8**	**19.9**	**23.3**	**25.9**	**6.9**	**67.2**	**11.2**
RJ	Ajmer	60	80.0	54.4	8.7	37.0	22.4	60.3	17.2	100.0	20.7	6.9	72.4	32.2	30.5	37.3	19.6	3.6	76.8	78.3
	Banswara	60	90.0	65.2	8.7	26.1	58.3	28.3	13.3	91.4	27.1	8.5	64.4	58.6	20.7	20.7	11.9	3.4	84.8	25.0
	Jodhpur*	58	91.4	51.2	4.9	43.9	42.9	25.0	32.1	98.2	22.2	7.4	70.4	43.4	24.5	32.1	14.3	0.0	85.7	74.1
	Total	**178**	**87.1**	**57.1**	**7.5**	**35.3**	**41.4**	**37.9**	**20.7**	**96.5**	**23.4**	**7.6**	**69.0**	**44.7**	**25.3**	**30.0**	**15.2**	**2.4**	**82.3**	**59.0**
	Total	**898**	**77.1**	**60.0**	**9.1**	**30.9**	**31.9**	**44.6**	**23.5**	**86.1**	**34.3**	**18.5**	**47.2**	**54.7**	**21.2**	**24.1**	**23.5**	**7.7**	**68.8**	**26.9**

* In Jodhpur district, 2 schools were closed during the baseline visit and were therefore dropped from the sample.

Table 5

Households characteristics (%)

State	District	No. of households visited	Household size				Parents schooling		House material			Electricity connection	Water supply	Asset ownership				Program entitlements			
			1–3 members	4–6 members	7–9 members	10+ members	Mothers with no schooling	Fathers with no schooling	Pucca	Semi pucca	Kutcha			0 items	1 item	2 items	3+ items	BPL card	NREGA card	Ration card	None
AS	Cachar	1360	3.8	69.2	23.3	3.7	23.2	19.7	12.6	21.3	66.1	34.1	43.6	14.2	45.3	19.4	21.1	17.5	23.4	42.7	16.5
	Dhubri	1183	1.9	50.6	38.4	9.0	67.4	59.4	8.8	9.4	81.9	14.5	68.0	12.7	54.9	24.6	7.8	6.3	16.5	62.3	15.0
	Dibrugarh	782	5.9	64.9	23.4	5.8	32.7	18.5	19.4	11.2	69.4	42.0	82.4	12.2	48.9	20.6	18.3	11.1	15.5	46.7	26.7
	Total	**3325**	**3.5**	**60.9**	**29.4**	**6.3**	**41.2**	**34.1**	**12.8**	**14.6**	**72.7**	**28.9**	**61.4**	**13.2**	**49.3**	**21.4**	**16.1**	**12.0**	**19.1**	**50.6**	**18.4**
AP	Cuddapah	994	6.5	80.2	12.1	1.3	52.6	38.5	70.7	19.4	9.9	98.3	9.8	1.8	18.3	22.2	57.7	7.9	14.7	76.5	1.0
	Medak	1636	4.9	69.1	19.4	6.5	83.6	66.7	19.5	76.1	4.4	97.0	45.8	0.2	15.5	26.3	58.0	12.5	1.8	84.9	0.7
	Prakasham	1234	5.1	85.5	8.7	0.7	73.7	51.4	65.0	20.2	14.8	95.2	22.6	1.0	20.7	33.6	44.7	6.3	0.9	88.7	4.1
	Total	**3864**	**5.4**	**76.9**	**14.3**	**3.5**	**72.1**	**53.9**	**47.3**	**43.6**	**9.1**	**96.8**	**29.3**	**0.9**	**17.8**	**27.4**	**53.9**	**9.3**	**4.8**	**84.0**	**1.9**
HP	Chamba	1214	1.6	59.7	31.0	7.7	57.9	24.3	28.2	26.6	45.2	94.9	34.2	3.4	42.2	37.4	17.1	24.6	16.8	44.6	14.0
	Mandi	1148	2.1	64.4	24.7	8.8	30.5	11.3	26.3	10.7	63.1	96.0	71.0	5.1	43.3	39.1	12.5	7.6	25.4	58.7	8.3
	Sirmaur	1302	0.8	47.8	36.5	15.0	46.9	25.3	62.9	7.4	29.7	96.6	59.4	3.9	29.1	31.3	35.8	16.4	8.5	64.4	10.6
	Total	**3664**	**1.5**	**56.6**	**31.2**	**10.7**	**45.3**	**20.4**	**39.7**	**14.9**	**45.4**	**95.8**	**54.5**	**4.1**	**37.6**	**35.6**	**22.7**	**16.4**	**16.6**	**56.1**	**11.0**
JH	Deoghar	2000	1.0	40.2	39.2	19.5	70.6	36.1	10.7	22.1	67.2	66.9	16.5	2.6	58.3	21.2	18.0	10.1	28.4	36.7	24.9
	Giridih	2079	0.7	32.5	40.2	26.7	81.8	39.5	22.5	17.4	60.1	43.0	30.2	2.8	54.1	34.5	8.7	10.9	9.3	42.5	37.3
	Ranchi	1827	1.6	50.9	38.0	9.6	73.0	40.2	10.5	14.3	75.1	41.0	11.1	3.4	74.2	14.5	8.0	5.8	23.4	33.3	37.6
	Total	**5906**	**1.1**	**40.4**	**39.2**	**19.3**	**75.1**	**38.5**	**14.6**	**18.1**	**67.3**	**50.8**	**19.4**	**2.9**	**61.8**	**23.5**	**11.9**	**9.0**	**20.1**	**37.7**	**33.2**
RJ	Ajmer	1906	1.5	52.7	36.9	8.9	84.4	33.9	10.7	22.1	67.2	77.3	25.0	1.8	26.8	32.0	39.4	0.1	2.1	94.5	3.4
	Banswara	1575	2.4	61.5	32.3	3.9	92.5	62.1	22.5	17.4	60.1	19.7	3.6	10.8	70.8	13.8	4.7	0.1	27.9	69.0	3.0
	Jodhpur	1269	0.6	46.7	40.5	12.1	90.0	51.4	10.5	14.3	75.1	52.6	32.4	6.5	52.3	24.9	16.3	0.5	2.5	90.4	6.6
	Total	**4750**	**1.5**	**53.9**	**36.4**	**8.2**	**88.6**	**47.9**	**14.6**	**18.1**	**67.3**	**51.5**	**19.6**	**4.7**	**41.6**	**27.0**	**26.8**	**0.2**	**10.8**	**85.0**	**4.1**
Total		**21509**	**2.3**	**54.8**	**31.9**	**10.9**	**67.5**	**40.0**	**31.4**	**21.3**	**47.4**	**63.6**	**33.8**	**4.5**	**42.2**	**26.9**	**26.4**	**8.8**	**14.5**	**61.6**	**15.1**

Table 6

Villages characteristics (%)

State	District	Village information available	Electricity	Post office	STD booth	Bank	PDS shop	Primary health centre	Private health centre	Asha worker	Govt. primary school	Govt. middle school	Govt. secondary school	Private school	Anganwadi
AS	Cachar	48	70.8	47.9	25.0	10.9	59.6	23.9	30.4	80.9	87.2	36.2	13.0	29.8	87.0
	Dhubri	53	48.1	26.4	34.0	9.4	84.9	25.0	5.7	75.0	90.6	50.0	30.0	28.9	92.3
	Dibrugarh	40	73.7	25.6	12.5	12.5	80.0	23.7	10.3	79.5	95.0	33.3	18.0	36.8	80.0
	Total	**141**	**63.0**	**33.6**	**24.8**	**10.8**	**75.0**	**24.3**	**15.2**	**78.3**	**90.7**	**40.6**	**20.7**	**31.4**	**87.0**
AP*	Cuddapah	59	100.0	59.3	67.8	17.2	64.4	28.8	22.0	72.4	96.6	39.0	27.6	15.3	94.9
	Prakasham	60	98.3	72.9	94.9	24.1	89.8	37.3	62.7	89.5	98.3	46.4	49.1	37.3	93.1
	Total	**119**	**99.2**	**66.1**	**81.4**	**20.7**	**77.1**	**33.1**	**42.4**	**80.9**	**97.4**	**42.6**	**38.3**	**26.3**	**94.0**
HP	Chamba	61	95.1	18.0	11.5	4.9	16.4	8.2	6.6	13.1	44.3	19.7	13.1	4.9	40.0
	Mandi	60	100.0	13.6	28.8	8.5	38.3	21.7	10.0	8.6	70.0	33.9	22.8	15.3	80.0
	Sirmaur	60	98.3	25.0	35.0	10.0	40.0	35.0	26.7	22.0	86.7	44.8	20.3	18.6	94.9
	Total	**181**	**97.8**	**18.9**	**25.0**	**7.8**	**31.5**	**21.6**	**14.4**	**14.6**	**66.9**	**32.6**	**18.6**	**12.9**	**71.5**
JH	Deoghar	59	78.0	10.3	10.2	5.1	27.1	8.5	6.8	84.8	76.3	55.9	8.9	14.0	82.5
	Giridih	60	61.7	11.7	26.7	6.7	55.9	13.3	35.6	56.9	75.0	61.0	17.2	20.3	81.0
	Ranchi	59	57.6	32.2	33.9	22.0	57.6	22.0	35.6	74.6	74.6	45.8	14.0	26.3	89.5
	Total	**178**	**65.7**	**18.1**	**23.6**	**11.2**	**46.9**	**14.6**	**26.0**	**72.2**	**75.3**	**54.2**	**13.5**	**20.2**	**84.3**
RJ	Ajmer	59	98.3	48.3	48.3	25.4	51.7	44.8	37.9	72.4	80.7	59.7	38.6	38.9	77.2
	Banswara	60	71.7	15.3	23.7	8.5	37.3	33.3	16.7	66.7	95.0	57.6	17.2	22.0	78.3
	Jodhpur	55	81.8	47.3	49.1	10.9	70.9	65.5	24.1	75.9	94.4	68.5	37.0	52.7	85.5
	Total	**174**	**83.9**	**36.6**	**40.1**	**15.0**	**52.9**	**47.4**	**26.2**	**71.5**	**90.1**	**61.8**	**30.8**	**37.5**	**80.2**
Total		**793**	**81.6**	**32.3**	**36.4**	**12.6**	**54.2**	**27.9**	**23.9**	**61.2**	**82.6**	**46.8**	**23.5**	**25.2**	**82.4**

* *Data not available for Medak District, Andhra Pradesh.*