Public Participation, Teacher Accountability and School Outcomes in Three States

PRIYANKA PANDEY, SANGEETA GOYAL, VENKATESH SUNDARARAMAN

This paper presents findings from baseline surveys on student learning achievement, teacher effort and community participation in three states – Karnataka, Madhya Pradesh and Uttar Pradesh. The results indicate low teacher attendance and poor student learning. Parents and school committees are neither aware of their oversight roles nor do they participate in school management. However, there is substantial heterogeneity in outcomes across states. Karnataka has better student and teacher outcomes, as well as higher levels of community awareness and participation than the other two states. The authors find substantial variation in teacher effort within schools, but most observable teacher characteristics are not associated with teacher effort. One reason for low teacher effort may be a lack of accountability. However, the gains in test scores associated with higher rates of teacher attendance and engagement in teaching are estimated to be small in Madhya Pradesh and Uttar Pradesh, suggesting that teachers themselves may not be effective.

This work benefited from generous financial support from the Education Program Development Fund and from the Government of the Netherlands through the World Bank-Netherlands Partnership Program. We are also grateful to the Nike Foundation for financial support. The findings, interpretations, and conclusions expressed here are those of the authors, and do not necessarily represent the views of the World Bank, its executive directors, or the countries they represent. An earlier version of this work appeared as a working paper in the World Bank Policy Research series.

Priyanka Pandey, Sangeeta Goyal (*sgoyal2@worldbank.org*) and Venkatesh Sundararaman are at the World Bank.

Learning outcomes have gained increasing importance in the policy debate on basic education in developing countries. This is especially true for countries that have achieved progress in providing most children with access to schools but continue to face issues of low school quality. Findings from studies reveal that while more than 90% of children between the ages of 6 and 14 years are in school in countries such as India, learning achievements are low. The problem of poor outcomes is a more general one and is not limited to the education sector. Various public services across many countries suffer from poor quality (Transparency International 2005; World Bank 2004). Interventions that provide physical resources alone will not be enough to improve outcomes if workers delivering the service do not perform as expected.

Targeting resources efficiently to communities and getting public workers to perform their tasks have remained challenges for public services in developing countries. These challenges are likely due to weak mechanisms of accountability. Monitoring by the local community can play a key role in improving public service delivery (World Bank 2004). To increase service providers' accountability to the local community, a number of developing countries, including India, have decentralised control over local public services to local communities. The Sarva Shiksha Abhiyan, a nationwide government scheme initiated in 2001 to universalise quality education, envisaged increasing accountability of schools to the community through greater involvement of village education committees (VECs) and parent-teacher associations (PTAs). However, anecdotal reports and survey-based evidence indicate that parents and members of these committees and associations are often uninformed of what services they are entitled to and what state-mandated controls they have over these services (Comptroller and Auditor General of India 2001; Bardhan and Mookherjee 2005; Banerjee et al 2006).

This paper presents findings from a survey conducted in three states – Karnataka (KA), Madhya Pradesh (MP) and Uttar Pradesh (UP) in 2006.[1] The survey measured student learning achievement, teacher effort and community participation. Learning outcomes are presented in the context of the minimum level of learning determined by the government of India. We report on learning gains across grade cohorts, and the characteristics of schools and teachers that correlate with learning. We also examine the correlations between teacher effort and several teacher characteristics.

Overall results indicate low learning achievement and low rates of teacher attendance and engagement in teaching. Parents

and school committees are neither aware of their oversight roles and responsibilities nor participating in school oversight. However, there is substantial variation in outcomes across states. Karnataka has better student and teacher outcomes as well as higher levels of community awareness and participation than the other two states.

Section 1 describes the context and background for the study. Section 2 describes the methodology and Section 3 provides the results. Section 4 summarises and discusses the key findings.

1 Background and Context for the study

The 73rd Amendment to the Indian Constitution in 1992 made it mandatory for Indian states to devolve control over public services and associated finances to the local village government, the gram panchayat.[2] However it was left up to the states as to how much control to devolve. Various states in India have chosen to devolve control over services to different extents. We provide a brief description of the school committees for public schools and their roles and responsibilities in the three study states.

Madhya Pradesh: A PTA is mandatory in every school. The PTA has an executive committee consisting of 14 members which runs the PTA. However, all parents are supposed to participate in decision-making. The PTA chair and school headmaster jointly operate the school account. The school account receives annual grants for repair and maintenance, school development, teaching learning materials (TLM), school uniforms, civil works and mid-day meals. The PTA is supposed to monitor learning, and to manage and monitor funds coming to the school accounts. It verifies each teacher's attendance in order for his/her monthly salary to be released.

Karnataka: Every school has a mandatory school development and monitoring committee (SDMC). Members of the SDMC include the head teacher of the primary school, elected members of the village government, and parents. One of the parents is the chair of the SDMC. The SDMC chair and the head teacher jointly operate the school account. The types of funds received in the school account are similar to those in Madhya Pradesh. The SDMC is supposed to monitor learning and hold a parent meeting every three months to discuss learning. The SDMC does not have explicit control over teachers, but in all three states, these committees can inspect schools and register complaints with district/block education offices.

Uttar Pradesh: A VEC is mandatory in every gram panchayat. The VEC typically has five members, chaired by the elected head of the village government. Other members include the senior-most teacher and three parents. The VEC chair and the head teacher of the school jointly operate the school account. In addition, the gram panchayat account, which is cosigned by the VEC chair, receives stipend funds and mid-day meal funds. The VEC is to monitor learning, and to manage and monitor school funds coming to the school account and the gram panchayat account. The VEC selects contract teachers and decides annually whether to renew their contracts.

2 Methods

This is a study of 610 gram panchayats across the three states. In each state, four districts were chosen purposefully, matched across states by literacy rates. Within a district, 50 gram panchayats were selected from two randomly chosen blocks. A block is an administrative unit between a district and a village. This gives a total of 200 villages per state in MP and UP. In Karnataka, the sample size is 210 villages.

In each gram panchayat, one school was randomly selected from all public schools that had grades one to five. Teachers teaching these grades in the school are in the sample. In MP and UP, 45 randomly chosen students in a school, 15 each from grades two, three and four are included. In Karnataka, 30 randomly chosen students in a school, 15 each from grades four and five are in the sample. School enrolment registers were used for random selection of students. Sometimes a given grade had less than the required number of students, in which case all students were selected. The survey was administered between February and April 2006 in MP and UP and between August and September 2006 in Karnataka.

Outcome Indicators

- Four unannounced visits were made, one every two to three weeks, to record teacher attendance and activity. Activity is a measure of whether a teacher is actively engaged in teaching when the team arrives. It is coded as 1 if the teacher is teaching, writing on the board, supervising written work, teaching by rote or another method, and as 0 if the teacher is absent, chatting, sitting idle or standing outside the classroom, keeping order but not teaching, or doing non-teaching work. *Teacher attendance* and *activity* variables are constructed as averages over the four visits and interpreted as the fraction of visits a teacher was present (or engaged in teaching). Both variables take values between 0 and 1.
- Test scores of sample students based on a competency and curriculum-based language and maths test that lasted approximately 20 minutes per child were used. The language test was a test of reading and writing skills. The maths test was a test of number recognition, addition, subtraction, multiplication and division. The test score in each grade is constructed separately for language and maths tests as a percentage of correct answers. In MP and UP, tests took place at the end of school year, while in Karnataka, they were four months later at the beginning of school year. Consequently, the test given to grade four (three) students at the end of the school year in MP and UP was given to grade five (four) students at the beginning of the school year in Karnataka.
- Interviews were conducted with school committee members about their knowledge and participation in oversight.

3 Results from Baseline Surveys

Learning Achievement

What Is the Benchmark? We use the minimum level of learning (MLL) framework recognised by the government of India as a benchmark for the minimum that a child in a given grade should know. The competencies tested for each grade in the survey fall within or below the set of competencies listed by the MLL for the grade. As an example, the MLL for language specifies a child in grade two should be able to read short paragraphs and write dictated

sentences. In maths, a child in grade two should be able to recognise numbers up to 100, do two-digit addition with carryover and subtraction with borrowing. At least 80% of children are expected to be able to do at least 80% of the competencies for the grade.[3]

Total Score: Learning achievement measured by the percentage of correct responses is low in all three grades in MP and UP and relatively higher in Karnataka (Table 1).

Item-wise Performance: Tables 2-7 (pp 77, 78) present item-wise performance of children in language and maths in grades two through four in MP and UP and in grades four through five in Karnataka.

Table 1: Summary of Key Variables

Mean Student Variables	UP Mean	UP Standard Deviation	MP Mean	MP Standard Deviation	KA Mean	KA Standard Deviation
% Correct score						
Grade 4 – maths (class 5 for KA)	.23	.29	.29	.29	.69	.28
Grade 4- language (class 5 for KA)	.27	.35	.33	.34	.75	.29
Grade 3 – maths (grade 4 for KA)	.17	.28	.26	.30	.67	.31
Grade 3- language (grade 4 for KA)	.21	.32	.30	.35	.68	.31
Grade 2- maths	.13	.26	.25	.31	-	
Grade 2- language	.20	.29	.31	.33	-	
Age	8.72	1.61	8.95	1.57	10.08	.82
Gender (1 if male)	.49	.50	.51	.50	.52	.50
General caste (neither SC/ST, nor OBC)	.15	.36	.20	.40	.04	.19
OBC	.40	.49	.31	.46	.51	.5
SC	.44	.50	.15	.36	.33	.47
ST	-	-	.34	.47	.13	.34
Mother literate	.21	.40	.13	.33	.37	.48
Father literate	.60	.49	.46	.50	.56	.50
Land owned (in acres)	1.13	1.65	2.50	4.27	3.33	4.54
Mean school-level characteristics						
Enrolment	178	89	119	66	137	129
Pupil-teacher ratio	66	39	56	30	27	17
% of schools with toilet	.33	.47	.38	.49	.72	.45
% of schools with drinking water	.83	.38	.72	.45	.66	.48
% of schools with playground	.79	.41	.50	.50	.46	.50
% of schools with electricity	.01	.07	.07	.25	.59	.49
Number of blackboards§	3.75	1.77	3.32	1.84	5.84	3.81
Mean teacher-level characteristics						
Attendance (mean over four visits)	.64	.48	.67	.47	.88	.32
Activity (mean over four visits)	.25	.43	.30	.46	.68	.47
% of contract teachers	.41	.20	.15	.36	0	0
% of former contract teachers	-	-	.45	.50	-	-
Age (years)	38	14	39	9	39	8
Non-SC/ST	.80	.40	.69	.46	.76	.43
% male	.60	.49	.80	.40	.59	.49
% with class 12 degree	.42	.49	.48	.50	.72	.45
% with college degree	.32	.47	.30	.46	.26	.44
% with graduate degree	.26	.44	.23	.42	.03	.16
% with pre-service training	.59	.49	.36	.48	.93	.26
Distance to work (km)	6	10	9	12	10	11
Teaching experience (years)	10.9	13	13.8	10	12	8
% doing multi-grade teaching	.81	.39	.87	.34	.91	.29
Days of in-service training	5.83	8	10.95	12	8.57	8

SC stands for "scheduled caste"; ST stands for "scheduled tribe"; and OBC stands for "other backward classes". Non-SC/ST = OBCs and general castes.
Teacher attendance and activity as explained above.
§ Number of blackboards = the number of functional blackboards in all classrooms of the school.
Source: Authors' data.

There are two key points that come out of these tables. First, on all competencies including the most basic ones, such as recognising words, recognising numbers or solving addition or subtraction, children in MP and UP perform dismally and children in Karnataka do way better. As Table 2 shows, barely 22% in UP and 33% in MP can read a simple sentence after four years of schooling compared to 73% in Karnataka.

Second, as Figures 1-2 (p 78) and Tables 2-7 show, the learning gain across grade cohorts is small for MP and UP. The gain in Karnataka also seems small, although what is going on in Karnataka may be different. A large fraction of the sample children in Karnataka know the tested competencies (which are fairly basic for the grades) and so there may not be much room for an improvement.

Table 2: What Do Grade 4 Children Know in Language?

Percentage Children Correct	UP	MP	KA	Grade Level at Which the Competency is Specified in MLL framework
Can read at least three of five words (without matra)	46	54	92	1&2
Can read at least three of five words (with matra)	33	38	89	1&2
Can read simple sentence	22	33	73	2
Can write at least two of three words (without matra)	31	35	78	1
Can write at least two of three words (with matra)	16	22	68	1
Can write short sentence	13	19	47	2

Tests conducted at end of school year for grade four in MP/UP and start of school year for class five in KA.
Source: Authors' data.

Table 3: What Do Grade 4 Children Know in Maths?

Percentage Children Correct	Test Item	UP	MP	KA	Grade Level at Which the Competency is Specified in MLL Framework
Number recognition two-digit		31	46	93	1
Number recognition three-digit		16	19	84	3
Two-digit addition without carryover	62+35	53	64	91	2
Two-digit addition with carry over	85+46	26	42	80	3
Two-digit subtraction without borrowing	54-32	41	48	84	2
Two-digit subtraction with borrowing	84-39	18	20	63	2
Multiply two digit by one digit	43 x 8	15	25	59	3
Multiply two digit by two digit	35 x 24	10	14	40	4
Divide two digit by one digit	54 ÷ 6	14	19	60	3
Divide three digit by one digit	585 ÷ 9	8	11	41	4

Tests conducted at end of school year for grade four in MP/UP and start of school year for class five in KA.
Source: Authors' data.

Table 4: What Do Grade 3 Children Know in Language?

Percentage Children Correct	UP	MP	KA	Grade Level for the Competency as Specified in MLL
Can read at least three of five words without matra	38	47	86	1
Can read at least three of five words with matra	22	34	81	2
Can read sentence	14	26	61	1&2
Can write at least two out of three words without matra	31	36	76	1
Can write at least two out of three words with matra	13	21	60	1
Can write short sentence	10	18	40	1&2

Tests conducted at the end of the school year for grade three in MP/UP and the start of the school year for class four in KA.
Source: Authors' data.

Table 5: What Do Grade 3 Children Know in Maths?

Percentage Children Correct	Test item	UP	MP	KA	Grade Level for the Competency as Specified in MLL
Number recognition, 20-40		29	50	87	1
Number recognition, 40-99		20	35	83	1
Two-digit addition without carryover	62+35	35	51	87	2
Two-digit addition with carryover	53+39	15	26	69	2
Two-digit subtraction without borrow	45-23	28	35	77	2
Two-digit subtraction with borrow	54-36	9	11	50	2
Multiply one-digit by one-digit	6 x 8	12	20	66	2
Multiply two-digit by one-digit	42 x 5	10	14	50	3
Divide two-digit by one-digit	64 ÷ 8	9	11	54	3

*Tests conducted at the end of the school year for grade three in MP/UP and the start of the school year for class four in KA
Source: Authors' data.

Table 6: What Do Grade 2 Children Know in Language?

Percentage Children Correct	UP	MP	Grade Level for the Competency as Specified in MLL
Alphabet recognition	32	53	1
Can read at least three of five words without matra	22	31	1
Can read at least three of five words with matra	11	19	1
Can write at least two of three words without matra	21	28	1
Can write at least two of three words with matra	7	15	1

Source: Authors' data

Table 7: What Do Grade 2 Children Know in Maths?

Percentage Children Correct	Test Item	UP	MP	Grade Level for the Competency as Specified in MLL
Number recognition, 11-20		21	45	1
Number recognition, 21-40		14	29	1
Writing two-digit numbers, 21-40		14	31	1
One-digit addition	5+3	22	38	1
Two-addition without carryover	26+43	17	27	2
One-digit subtraction	8-5	12	21	1
Two-digit subtraction without borrowing	25-12	12	18	2
Multiply one-digit by one-digit	6 x 4	7	14	2
Which is largest of three two-digit numbers	56, 84, 69	8	16	1

Source: Authors' data.

If the sample of children is similar across grades, these gains will be close to the actual learning gains on the concepts tested as a child progresses through grades. The results present a fairly stark picture. Despite the approximate 220 days of schooling children are supposed to receive in a year, little learning is taking place in MP and UP. In these states, as Tables 2 and 4 show, as many as 74-86% of children at the end of grade three cannot read a simple sentence and this percentage continues to be 67-78 for children at the end of grade four.

Learning Decomposition

Are Student and Family Characteristics Correlated with Performance? Table 8 presents results from grade-wise linear regression, where the dependent variables are the percentage of correct scores on language and maths tests. School fixed effects control for observed and unobserved characteristics of the school and the village that are correlated with learning achievement. Student characteristics on the right hand side are age, gender, caste, education of parents and whether the land owned by the family is above the sample median.

Many observed student characteristics in UP, a few in MP and almost none in Karnataka are significantly correlated with test scores. In UP, the student's age, gender, caste, parents' education and family wealth are all significant and sizeable in the test score regressions (Table 8 and Figures 3-4, p 79). Boys score higher than girls. Students' belonging to the high castes (i e, the general caste which is neither OBC nor SC/ST) score higher and those with above median wealth score higher. Students with a literate mother as well as those with a literate father score higher.

Figure 1: Gain in Reading Across Grades
(Reading across grade cohorts, % children)

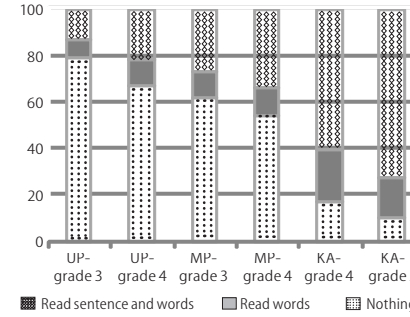
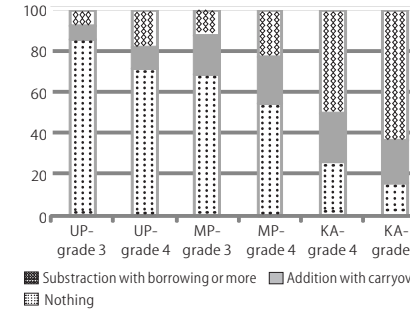


Figure 2: Gain in Mathematics Across Grades
(Selected math competencies across grade cohorts, % children)



In MP, the student's gender, caste and mother's education are significant in the test score regressions (Table 8 and Figures 3-4). Boys and high caste students do better. Those with literate mothers also have higher scores.

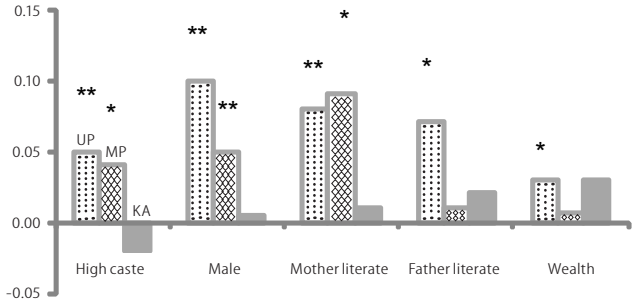
In contrast, in Karnataka, none of the observed student characteristics are significantly correlated with test scores. This may suggest that when schools are good, learning in school makes up for some of the household differences in learning and when

Table 8: Are Student Characteristics Correlated with Scores? (OLS)
Dependent variable is the percentage correct score (Grade four in UP/MP, Grade five in KA)

	UP		MP		KA	
	Hindi	Maths	Hindi	Maths	Kannada	Maths
Age	0.02	0.02	-0.02	-0.01	0.00	0.00
	(0.01)**	(0.00)**	(0.00)**	(0.13)	(0.94)	(0.83)
General caste	0.08	0.05	0.04	0.04	-	-
	(0.00)**	(0.00)**	0.12	(0.05)*	-	-
OBC	0.05	0.04	-0.02	-0.02	-0.02	-0.02
	(0.10)	(0.05)*	(0.39)	(0.36)	(0.13)	(0.22)
ST	-	-	-0.07	-0.04	-0.04	-0.02
			(0.02)*	(0.16)	(0.10)	(0.30)
Wealth	0.04	0.03	0.02	0.01	0.02	0.03
(1 if land above median)	(0.01)**	(0.01)**	(0.34)	(0.68)	(0.18)	(0.07)
Gender (1 if male)	0.06	0.10	0.05	0.05	-0.01	0.00
	(0.00)**	(0.00)**	(0.01)**	(0.00)**	(0.32)	(0.74)
Mother literate	0.10	0.08	0.12	0.09	0.02	0.01
	(0.00)**	(0.00)**	(0.00)**	(0.00)**	(0.17)	(0.31)
Father literate	0.08	0.07	0.02	0.01	0.00	0.02
	(0.00)**	(0.00)**	(0.18)	(0.24)	(0.86)	(0.08)
School/village fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
n	2,579	2,579	2,321	2,321	2,176	2,176
R-squared	0.28	0.27	0.34	0.43	.35	.44

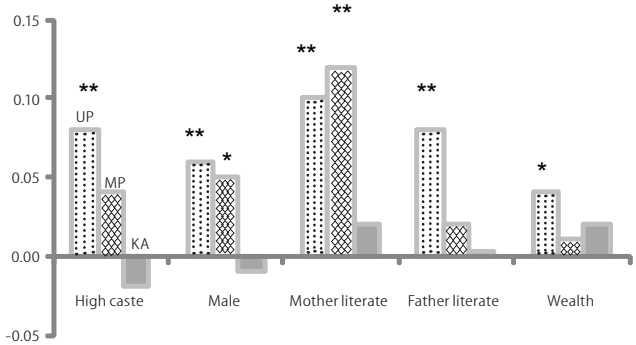
SC stands for "scheduled caste"; ST stands for "scheduled tribe"; and OBC stands for "other backward classes". Non-SC/ST = OBCs and general castes.
Robust p values in parentheses clustered at gram panchayat level, * significant at 5% level; ** significant at 1% level.

Figure 3: Adjusted Score Gap in Mathematics
(Grade 4, % point score gap)



** p value below 1%. * p value below 5%

Figure 4: Adjusted Score Gap in Language
(Grade 4, % point score gap)



** p value below 1%. * p value below 5%

students are not learning in school, family factors continue to matter more for learning outcomes. Overall, the results are similar for other grades.

Which of the School and Teacher Characteristics Are Correlated with Student Performance? To examine the correlation between test scores and school characteristics, test scores are regressed on student characteristics, school characteristics, and block level fixed effects. Student characteristics included are age, gender, caste, parental education and wealth. Since multigrade teaching is widespread in sample schools, it is difficult to identify one teacher to a class. Average teacher characteristics at the school level are used as independent variables in the regression along with other school characteristics. The latter include the teacher-pupil ratio, the index of school infrastructure (which is the sum of four indicator variables on whether school has water, toilet, playground, electricity and the total number of blackboards in school), the percentage of teachers with college degrees, percentage of teachers with graduate degrees, percentage of teachers with pre-service training, percentage of male teachers, percentage of general caste teachers, mean age of teachers, mean years of teaching experience, mean days of in-service training in last school year, mean teacher attendance, mean teacher activity and percentage of contract teachers. Table 9 presents the results from these regressions.

In UP, teacher-pupil ratio and teacher activity are positively and significantly correlated with language and maths test scores in all grades (Table 9).[4] In MP, teacher activity is positively and significantly correlated with language and maths test scores in all grades. In Karnataka, teacher attendance is the only variable significantly correlated with both language and maths test scores in all grades. Other school and teacher characteristics, including teacher training, are not correlated with test scores.

The one school characteristic that is consistently and significantly correlated with learning achievement is teacher engagement in teaching in MP and UP and teacher presence in Karnataka. In all three states, most other school and teacher characteristics are not correlated with test scores. In Karnataka, 88% of teachers are present and of those present, nearly 80% are actively engaged in teaching. Since most teachers present are teaching, this may explain why teacher attendance is significant in the score regressions and not teacher activity.

Based on the regression coefficients, we calculate that if about half the teachers were engaged in teaching in MP and UP, i e, if teaching activity roughly doubled in magnitude, scores would be higher by 17-31% in maths and language in the three grades. We would expect an increase in teacher activity of this proportion to be associated with a bigger increase in scores. One reason for a small effect is that teacher activity probably does not measure real teacher effort precisely. Another reason is that teachers may not be effective in classrooms in MP and UP. If average teacher attendance and engagement in teaching in MP and UP were to be the same as in Karnataka and assuming all other factors influencing learning stayed constant, the average scores in these two states would still be below 40%, far from the average of 70-75% in Karnataka.

Although we have reported test score correlations (not causations) based on a cross-section survey, our findings are consistent with international evidence on the impact of school and teacher

Table 9: Are School and Teacher Characteristics Correlated with Scores? (OLS)
(Dependent variable is percentage correct score, Grade four in UP/MP, Grade five in KA)

	UP		MP		KA	
	Hindi	Maths	Hindi	Maths	Kannada	Maths
Teacher-pupil ratio	5.0	4.9	0.96	0.14	-0.10	0.06
	(0.00)**	(0.00)**	(0.41)	(0.86)	(0.82)	(0.87)
Index of infrastructure	0.00	0.00	0.01	0.00	0.01	0.00
	(0.88)	(0.62)	(0.10)+	(0.67)	(0.03)*	(0.68)
% non-SC teachers	-0.03	-0.05	-0.05	-0.05	-0.01	0.04
	(0.56)	(0.15)	(0.18)	(0.16)	(0.78)	(0.33)
% male teachers	0.01	0.01	-0.03	-0.04	0.01	0.06
	(0.89)	(0.71)	(0.54)	(0.35)	(0.73)	(0.11)
% teachers with college degree	0.05	0.01	0.01	0.02	0.02	-0.02
	(0.29)	(0.83)	(0.79)	(0.55)	(0.57)	(0.50)
% teachers with graduate degree	0.05	0.02	0.04	0.04	0.21	0.10
	(0.25)	(0.57)	(0.51)	(0.35)	(0.05)*	(0.35)
Average years of service	0.00	0.00	0.00	0.00	0.00	-0.004
	(0.63)	(0.76)	(0.29)	(0.37)	(0.24)	(0.05)
Average days in service in last year	0.00	0.00	0.00	0.00	0.00	0.00
	(0.92)	(0.40)	(0.44)	(0.43)	(0.72)	(0.66)
% teachers with pre- service training	0.01	-0.02	-0.01	-0.03	0.03	0.04
	(0.80)	(0.64)	(0.72)	(0.26)	(0.51)	(0.33)
% teachers doing multi-grade teaching	-0.01	0.03	-0.09	-0.06	-0.05	-0.04
	(0.94)	(0.54)	(0.12)	(0.22)	(0.32)	(0.29)
% teachers actively engaged in teaching	0.15	0.17	0.19	0.20	-0.12	-0.13
	(0.05)*	(0.00)**	(0.01)**	(0.00)**	(0.16)	(0.10)
% teachers present in school	-0.02	-0.05	-0.09	-0.05	0.26	0.27
	(0.73)	(0.28)	(0.19)	(0.42)	(0.02)*	(0.02)*
Block fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
n	2,553	2,553	2,142	2,142	2,086	2,086

Robust p values in parentheses clustered at gram panchayat level, * significant at 5% level; ** significant at 1% level; + significant at 10%. Other controls include all student characteristics listed in Table 8 and block fixed effects.

characteristics on student test scores. A number of studies find no impact of class size on student performance (Hanushek 1998; Lazear 1999) consistent with our results from MP and KA. There is evidence that the impact of class size may depend on the absolute class size. Class size may matter when the average size is quite large, as we find in UP, where average class size is 70.

There is also fairly robust evidence that among the school-level variables which can be influenced by policy, factors to do with teachers and teaching are the most important influences on student learning. The broad consensus is that teacher quality is the single-most important school variable influencing student learning (Darling-Hammond 2000; Rockoff 2004; Rivkin, Hanushek and Kain 2005). But what it is about teachers that matters is not known. Researchers agree that many important aspects of teacher quality are not captured by commonly used quality indicators such as education, experience, and subject matter knowledge. Broadly parallel to these findings, our results show that teacher effort is positively correlated with student performance, unlike other attributes of teachers such as education, experience and training that have zero correlation with student performance.[5]

Teacher Effort

Since teacher effort is consistently correlated with student performance, unlike other school attributes, it is useful to examine which teachers work harder than others. While the data cannot shed light on why teacher effort varies across states or why some teachers are more motivated than others, it captures the variation in effort due to observed teacher characteristics commonly used by policymakers and school administrators as indicators of teacher quality. Mean teacher attendance and engagement in teaching are low in both MP and UP, and much higher in Karnataka (Table 1).

Which Characteristics Are Correlated with Teacher Presence and Engagement at Work? To examine which teacher attributes are associated with teacher effort, we regress teacher attendance and activity on teacher characteristics and school fixed effects. Teacher characteristics included on the right hand side are age, gender, caste, education, whether the teacher has pre-service training, number of years of service, number of days of in-service training in the last school year and whether the teacher's appointment is on a contract basis. Table 10 presents the results.

In UP, teachers more likely to be present are teachers on contract, and those without a college degree or a graduate degree. Teachers more likely to be engaged in teaching are teachers on contract, those without a college or a graduate degree, younger and female teachers. Contract teachers' attendance is higher by 10 percentage points and activity is higher by 7 percentage points compared to regular teachers. Both these differences are significant at p values below 5%. Pre-service and in-service training are not significantly correlated with effort.

In MP, teachers younger in age are more likely to be present. Teachers more likely to be active are those on contract, younger, without a college degree and with fewer years of experience. Pre-service and in-service trainings are not correlated with teacher

Table 10: Village Fixed Effects Regression of Teacher Effort (OLS)
(Dependent variable includes indicator variables for attendance and activity)

	UP		MP		KA	
	Attendance	Activity	Attendance	Activity	Attendance	Activity
Whether teacher is a contract teacher (*shiksha mitra*)	0.10 (0.05)*	0.07 (0.04)*	-	-	-	-
Whether teacher is a *samvida shikshak* (contract teacher)	-	-	0.08 (0.14)	0.10 (0.03)*	-	-
Whether teacher is a *shiksha karmi* (former contract teachers)	-	-	0.02 (0.62)	0.05 (0.16)	-	-
Age	-0.004 (0.11)	-0.004 (0.05)*	-0.01 (0.04)*	-0.01 (0.01)**	0.00 (0.13)	0.004 (0.05)*
Caste (1 if non-SC)	-0.03 (0.31)	0.01 (0.63)	-0.01 (0.66)	0.02 (0.16)	-0.01 (0.60)	-0.01 (0.27)
Gender (1 if male)	-0.02 (0.57)	-0.09 (0.00)**	0.05 (0.15)	-0.01 (0.66)	-0.04 (0.01)**	-0.06 (0.01)*
College-educated	-0.07 (0.04)*	-0.04 (0.13)	-0.05 (0.14)	-0.06 (0.05)*	0.03 (0.10)	0.07 (0.01)**
Graduate degree	-0.13 (0.00)**	-0.07 (0.01)*	-0.03 (0.45)	-0.04 (0.23)	-0.04 (0.39)	-0.15 (0.03)*
Pre-service training	-0.04 (0.39)	-0.01 (0.88)	-0.03 (0.35)	-0.03 (0.38)	-0.01 (0.84)	0.02 (0.61)
Years of service	0.00 (0.22)	0.00 (0.69)	0.00 (0.68)	-0.01 (0.04)*	0.00 (0.22)	0.00 (0.50)
Days of in-service training	0.00 (0.90)	0.00 (0.63)	0.00 (0.55)	0.00 (0.23)	0.002 (0.03)*	0.00 (0.30)
Village/school fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	.18	.23	.23	.22	.15	.14
Observations	2,416	2,415	1,792	1,792	3,374	3,374

SC stands for "scheduled caste"; ST stands for "scheduled tribe"; and OBC stands for "other backward classes". Non-SC/ST = OBCs and general castes.

Table 11: VEC Members' Knowledge and Participation in UP

Percentage Members That Say Yes or Give the Correct Response	Headmaster	Pradhan	Parents
Do you know if you are a member of the VEC?	91	86	85
Have you received any training on roles/responsibilities of the VEC?	11	3	2
Has the VEC met in this school year?	78	49	30
Has the VEC inspected the school in this school year?	62	62	38
Do you know who operates the school account?	78	68	28
Do you know which account the scholarships comes to?	75	57	28
Do you know which account mid-day meal money comes to?	67	54	17
How many other VEC members can you name (on average, a VEC has 5 members) – number of members named correctly	3	2	1

Source: Authors' data.

Table 12: Can VEC Members List Their Roles/Responsibilities in UP?

Percentage Members That List Each Item	Headmaster	Pradhan	Parents
Inspect schools	49	38	21
Manage civil works	43	16	12
Prepare schemes/plans for school improvement	25	13	7
Manage school accounts, decide how to spend funds in school accounts	9	6	2
Select shiksha mitra	5	5	2
Ensure teachers come regularly and on time	37	29	15
Ensure teachers teach satisfactorily	42	27	21
Complain to higher authorities if teachers' performance/attendance is unsatisfactory	21	21	11
Ensure distribution of textbooks	14	11	4
Ensure distribution of scholarships	24	16	11
Ensure preparation and distribution of quality mid-day meals	34	35	26
Ensure distribution of uniforms	10	10	6

Source: Authors' data.

Figure 5: UP Village Education Committee Members' Responses (%)

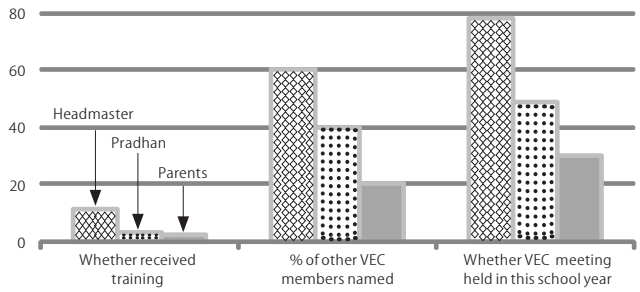


Figure 6: MP: PTA Committee Members' Responses (%)

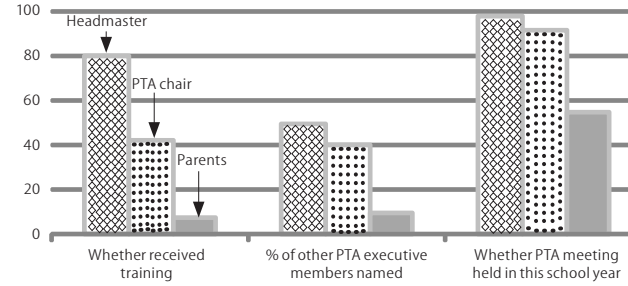
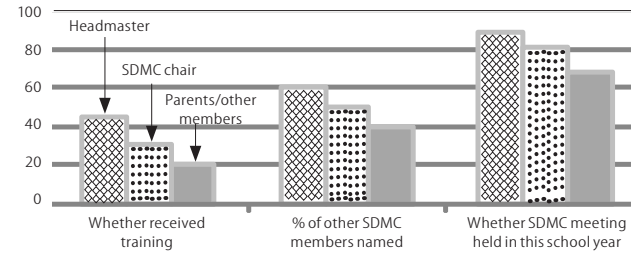


Figure 7: KA: SDMC Members' Responses (%)



effort. Contract teachers' activity is 10 percentage points higher compared to regular teachers with a *p* value below 5%.

In Karnataka, female teachers are more likely to be present. Teachers more likely to be actively engaged in teaching are female, older and with a college degree. Teachers with post-graduate degrees are less likely to be engaged in teaching compared to those with high school degrees.

There are three main themes here. The first is that teachers who are more qualified in terms of measurable characteristics, for example, those with more education or experience, are likely to put in less effort, particularly in MP and UP. This may have to do with the more qualified teachers having an elite status in the community. The second theme is that most of the variation in teacher effort is within schools. The percentage of variation in teacher activity that is explained by differences between schools and villages is 21 in MP, 17 in UP and 13 in KA. The third point is that in all of the states, observed teacher characteristics explain less than 6% of the variation in teacher effort within schools. These observations are consistent with other studies, although mainly from developed countries that find substantial variation in teacher quality within schools and that observed teacher characteristics explain very little of teacher quality (Rockoff 2004; Rivkin Hanushek and Kain 2005; Aaronson Barrow and Sander 2007).

Table 13: PTA Members' Knowledge and Participation in MP

Percentage Members That Say Yes or Give the Correct response	Headmaster	PTA Chair	Parents
Do you know if you are a member of the PTA executive committee?	98	97	70
Have you received any training on roles/ responsibilities of the PTA?	80	42	8
Has the PTA met in this school year?	98	92	55
Has the PTA inspected the school in this school year?	89	87	34
Do you know who operates the school account?	93	73	19
Do you know which account the scholarships come to?	74	18	8
Do you know which account the mid-day meal money comes to?	94	74	24
How many other PTA members can you name? (on average, the PTA has 10-13 members) – number of members named correctly	5	4	1

Source: Authors' data.

Table 14: Can PTA Members List Their Roles/Responsibilities in MP?

Percentage Members That List Each Item	Headmaster	PTA Chair	Parents
Inspect schools	59	52	16
Manage civil works	46	21	5
Prepare schemes/plans for school improvement	26	5	2
Manage school accounts, decide how to spend funds in school accounts	17	4	1
Verify and sign on teachers' salary slips/attendance registers each month	14	6	1
Ensure teachers come regularly and ontime	42	47	20
Ensure teachers teach satisfactorily	35	49	21
Recommend reducing/stopping teachers' salary if teachers' performance/attendance is unsatisfactory	6	3	1
Ensure distribution of textbooks	18	5	1
Ensure distribution of scholarships	15	4	1
Ensure preparation and distribution of quality mid-day meals	73	70	28
Ensure distribution of uniforms	23	12	3

Source: Authors' data.

Local Community Role

Last, we discuss an important strand of the survey that measures community participation in school oversight. In line with the variation in teacher effort, there is parallel variation in community participation across the three states.

Committees with Oversight Responsibilities: Tables 11-16 present the awareness and participation of VEC, PTA and SDMC members in school oversight. A large proportion of committee members in all three states had not received any training on their roles and responsibilities. Parent members of these committees had the least positive responses. About 20% of parent members reported receiving training in Karnataka, compared to 8% in MP and 2% in UP. In all states, headmasters seem to be the most informed about the roles and responsibilities of the school committee. Parent members seem to be the least informed and seem to participate the least.

In UP, when asked to list the roles and responsibilities of VEC, 52% of the parent members could not list a single one. On average, parent members could correctly name only one out of five VEC members (Tables 11-12, p 80, Figure 5).

In MP, 58% of parent members of the PTA executive committee could not list a single role or responsibility. On average, parent members could correctly name only one PTA member out of 10-13 (Tables 13-14, Figure 6).

Table 15: SDMC Members' Knowledge and Participation in KA

Percentage Members That Say Yes or Give the Correct Response	Headmaster	SDMC Chair	Parent/Other Members
Do you know if you are a member of the SDMC?	88	92	96
Have you received any training on roles/ responsibilities of the SDMC?	45	31	20
Has the SDMC met in this school year?	89	81	69
Has the SDMC inspected the school in this school year?	82	80	63
How many other SDMC members can you name (on average, the SDMC has 10 members)? Number of members named correctly	6	5	4
Do you know who operates the school account?	79	76	67
Do you know which account the scholarships come to?	88	77	67
Do you know which account the mid-day meal money comes to?	92	92	95

Source: Authors' data

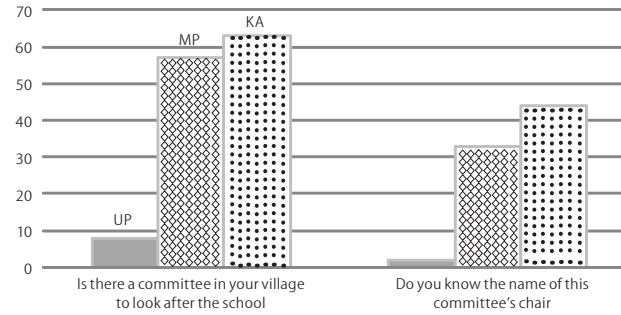
Table 16: Can SDMC Members List Their Roles/Responsibilities in KA?

Percentage Members That List Each Item	Headmaster	Chair	Parents
Inspect schools	79	79	62
Manage civil works	75	68	49
Prepare schemes/plans for school improvement	63	58	41
Manage school accounts, decide how to spend funds in school accounts	48	46	31
Ensure teachers come regularly and on-time	50	51	30
Ensure teachers teach satisfactorily	34	41	28
Complain to higher authorities if teachers' performance/attendance is unsatisfactory	27	35	27
Ensure distribution of textbooks	42	46	33
Ensure distribution of scholarships	37	37	33
Ensure preparation and distribution of quality mid-day meals	46	45	43
Ensure distribution of uniforms	39	33	25

Source: Authors' data.

Parent members of the SDMCs in Karnataka seem to be more informed about their roles and report greater participation in meetings and school inspections relative to their counterparts in MP and UP (Tables 15-16). Parent members could correctly name four out of 10 committee members on average (Figure 7, p 81).

Figure 8: Parents' Awareness of School Committees (Parents response, % saying yes)



Are Parents Aware of School Oversight Committees? Barely 8% of parents in the sample were aware of the VEC in UP. On the other hand, in MP and Karnataka, 57% and 63% of parents were aware of the respective committees. Parents were asked to name the chair of the school committee. The percentage of parents correctly able to name the chair was the highest in Karnataka, followed by MP and UP, where barely 2% of parents responded correctly (Figure 8).

4 Conclusions

Our survey indicates low levels of learning achievement on all competencies in the states of MP and UP, and relatively higher achievement in Karnataka. The competencies tested fall within the set of competencies identified in the MLL framework recognised by the government of India. Learning gains across grade cohorts are

low on all competencies, particularly in MP and UP. The norm of about 220 days in an additional school year is associated with fairly small increases of 8-10 percentage points in the proportion of children who can read or write simple text or solve basic maths. If the goal is that every child should master at least the grade-appropriate MLL, then 220 additional days of learning should lead to nearly all children being able to read or write simple text or solve basic maths. The actual gain in MP and UP is only about 9% of the educational gain that should be taking place in a school year. Roughly, we calculate this to be worth only about 20 school days a year instead of the 220 that teachers should be teaching.

The pattern of teacher attendance and the fraction of teachers observed to be engaged in teaching-related activity mirrors the difference in scores across states. Karnataka has a much higher fraction of teachers present and engaged in teaching compared to MP and UP. In regressions of student test scores on school characteristics, with the exception of teacher effort, most school inputs (including teacher qualification) are not correlated with scores. Teacher engagement in teaching in MP and UP and teacher attendance in Karnataka are consistently associated with higher scores. When we looked at characteristics that may predict which teachers work harder than others, we found most observed teacher characteristics such as education, experience and training are not positively correlated with teacher effort. Furthermore, teachers on contract have higher effort compared to permanent teachers, suggesting policies which reward teachers on the basis of traditional credentials such as education, experience and training may not be effective in raising teacher effort. Instead, policy may need to focus on improving teacher accountability.

Teacher accountability is low in part because communities are unable to hold them to account. A large proportion of school committee members had not received any training regarding their roles and responsibilities. Parent members of school committees in MP and UP are not participating in their oversight functions and have very low levels of awareness regarding their roles and responsibilities. Headmasters seem to be executing most of the functions of these committees. The communities at large are not aware of the existence of these committees. On the other hand, in Karnataka, school committee members are aware and participating to a greater extent. They report frequent committee meetings and school visits as well as greater knowledge of their oversight roles. Since the Sarva Shiksha Abhiyan provides resources to states for training school committees, at the minimum, the states can ensure that adequate training regarding oversight roles and responsibilities reaches them.[6]

NOTES

1 This work is part of a larger research programme that includes an experimental evaluation of campaigns to provide information to communities about their oversight roles and responsibilities in school management.

2 To remind the reader, a gram panchayat is the lowest administrative unit consisting of two to three revenue villages on average. The elected village government (gram panchayat council with the gram pradhan as its head) is formed at the gram panchayat level.

3 The framework can be found at www.education.nic.in/cd50years/r/2S/Book2S.htm.

4 In Table 9, we only report results for grade four in MP/UP and grade five in KA. Results for other grades are available with the author.

5 Two recent studies find that teacher attendance has a positive impact on test scores (Duflo, Hanna and Ryan 2007; Miller, Murnane and Willet 2007).

6 The evaluation being undertaken as part of this research programme will provide evidence on the impact on teacher effort when communities are better informed of their oversight roles.

REFERENCES

Aaronson, D, L Barrow and W Sander (2007): "Teachers and Student Achievement in the Chicago Public High Schools", *Journal of Labour Economics*, 25(1): 95-135.

Banerjee, A, R Banerji, E Duflo, R Glennerster and S Khemani (2006): "Can Information Campaigns Spark Local Participation and Improve Outcomes? A Study of Primary Education in Uttar Pradesh, India", World Bank Policy Research Working Paper 3967, Washington DC.

Bardhan, P and D Mookherjee (2005): "Decentralising Antipoverty Program Delivery in Developing Countries", *Journal of Public Economics*, 89(4): 675-704.

Comptroller and Auditor General of India (2001): "Report of the Comptroller and Auditor General of India on the Union Government". Accessed 1 October 2009: http://cag.gov.in/html/reports/civil/2001_book3/index.htm

Darling-Hammond, L (2000): "Teacher Quality and Student Achievement", *Education Policy Analysis Archives*, 8(1). Accessed 15 October 2009: http://epaa.asu.edu/epaa/v8n1.html

Duflo, E, R Hanna and S Ryan (2007): "Monitoring Works: Getting Teachers to Come to School", Department of Economics Working Paper, Massachusetts Institute of Technology.

Lazear, E (1999):"Educational Production", National Bureau of Economic Research Working Paper, Cambridge, Massachusetts.

Hanushek, E (1998): "The Evidence on Class Size", W Allen Wallis Institute of Political Economy Occasional Paper, University of Rochester.

Miller, R, R Murnane and J Willett (2007): "Do Teacher Absences Impact Student Achievement? Longitudinal Evidence from One Urban School District", National Bureau of Economic Research Working Paper, Cambridge, Massachusetts.

Rivkin, S, E Hanushek and J Kain (2005): "Teachers, Schools and Academic Achievement", *Econometrica*, 73(2): 417-58.

Rockoff, J (2004):"The Impact of Individual Teachers on Student Achievement: Evidence from Panel Data", *American Economic Review*, 94(2): 247-52.

Transparency International (2005): *Global Corruption Report 2006: Corruption and Health* (London: Pluto Press). Accessed 1 October 2009: http://www.transparency.org/publications/gcr/download_gcr_2006

World Bank (2004): *World Development Report: Making Services Work for Poor People* (New York: Oxford University Press).