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# Middle Schools in India: Access and Quality

## Endline Report

**ASER Centre, New Delhi**

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# Table of Contents

# List of Tables

# List of Figures

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# I. Introduction

## Background & objectives of the study[1]

On the brink of adulthood, adolescence is a distinct period marked by issues of personal identity coupled with expectations from the society. It is also a crucial period where important decisions related to education, career and life begin taking shape.

But is our educational policy equipped to cope with the realities of adolescent children and their context? For over a decade, the primary thrust of education policy in India has been on achieving universal access and retention at the elementary level. According to the Annual Status of Education Report (ASER 2014), the percentage of in-school children in the age group of 6-14 is over 96 percent. Further, under the Right of Children to Free and Compulsory Education Act, 2009 (RTE), all children in this age group are now guaranteed education until grade 8.

However, important questions remain regarding access to as well as quality and relevance of the education children receive at the post primary level. The available evidence on learning outcomes indicates that while school enrollment has expanded and retention has been ensured at the elementary level, learning levels remain poor. According to ASER 2014, the proportion of children in rural India in Std 5 who can read a Std 2 level text is 48.1 percent and 26.1 percent can solve a 3-digit by 1-digit division problem. In other words, half our children entering middle schools cannot read a Std 2 level text and only one out of four children can solve an arithmetic sum usually taught in Std 3-4. Other data on learning achievement, from Education Initiatives (EI) or Government of India's own assessments (using different methodologies and indicators) also demonstrate that learning outcomes at the primary stage are far from satisfactory.[2]

[1] This chapter is an updated version of the introduction to the baseline report for this study (2014).
[2] 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

Moving on to provisioning and retention at the secondary level we see that according to available government statistics on schools in the country, provisioning of post primary education seems to be grossly inadequate. As per DISE[3], at the all India level in 2012-2013, 83 percent schools in the country offered schooling in Std 1-5 and above, 40 percent schools offered schooling in Std 6-8 and above only 11 percent and 6 percent offered schooling in Std 9-10 and Std 11-12 respectively. According, the pilot study conducted in 2012 in 3 blocks (Sursa – Hardoi, Uttar Pradesh, Rajgir – Nalanda, Bihar and Satara – Satara, Maharashtra) we found that educational provisioning decreases at higher levels of schooling and it is increasingly reliant on the private sector at higher levels of schooling especially in case of Satara and Sursa. Low provisioning has serious implications for equity, particularly on how children from disadvantaged households access secondary education. According to the 64th Round of NSS (2007-2008), 33 percent of rural households did not have any secondary school within a distance of 3 km and there was also likely to be greater disparity in access for the poorest households in the country.[4]

The fact that a significant proportion of children may be entering secondary school without the expected competency levels and there is inadequate provisioning of schools offering post primary education, suggests that there is a need to understand the current situation related to transition and school choice, highlight challenges and suggest measures for planning to ensure the successful transition and retention of children into secondary education and learn well.

## About the study

The objective of this research study was to generate new evidence regarding access to and the quality of post primary education in India. As India moves towards guaranteeing quality elementary and secondary education for all children, it is important that policy making and planning be informed by an in-depth stock taking exercise that reviews where we are today and

[3] DISE Analytical Tables (Elementary) 2012-2013, Table 1.1, available at http://dise.in/Downloads/Publications/Documents/Analytical%20Table-12-13.pdf
[4] NSS 64th Round, Education in India: 2007-08 Participation and Expenditure, available at http://www.educationforallinindia.com/participation_and_expenditure_nsso_education.pdf, accessed on 18th July 2014

identifies key challenges that need to be addressed if quality secondary education for all is to be achieved. In particular, special attention needs to be paid to the issue of providing post primary educational opportunities to girls.

The study was thus designed to generate evidence (measures, methods and data) that can inform policy and planning in India. In addition to a desk review of available literature, project activities included a field study of upper primary and secondary schools to examine key indicators related to classroom dynamics, school organization and functioning, with special focus on the challenges faced by girls. The field study focused on a representative sample of rural children in Std 6-8 and on their educational trajectories in 2 selected states. One district was included in each state: Satara district in Maharashtra (industrial and educationally advanced state where women's status is considered to be relatively high) and Nalanda in Bihar (agricultural and educationally backward state).

The study followed a two stage sample design to get a representative sample of children by gender in grades 6, 7 and 8. In the first stage, 60 villages were sampled from the Census village list[5] using PPS (Probability Proportional to Size).[6] In the second stage, a house-listing was done in the sampled villages to create the frame for the target population and 10 children were sampled from this frame for each of the 6 groups. Data collection activities comprised of:

I. *Learning assessment*: To assess learning and skill levels of sampled children, two learning assessments were administered, to assess learning gains between baseline and endline.
II. *Household survey:* To collect background information on sampled children and their families. Detailed household information including a household roster, socioeconomic data, and indicators of the 'home literacy environment' was collected. Additional data on individual sampled students, such as aspirations, was also collected.
III. *School survey:* In each village, the school where the most sampled children were enrolled was also visited. The school survey included background information about facilities, teachers, enrollments, etc.; classroom observations that aim to capture patterns in

[5] The 2011 Census list was not available in the public domain at the time of sampling.
[6] Since villages are of different sizes, PPS in the first stage ensures equal probability of selection of the final units.

attendance, classroom organization, teaching methods, and teacher-student interactions; and assessments of teacher capability.

IV. *Child tracking:* An important part of the study was to track sampled children into the next academic year in order to understand patterns in dropout and retention.

This report summarizes preliminary findings from final round of data collection which included the end line learning assessment of sampled students.

# II. What do we know about post- primary schooling? A review of the literature

## 2.1 Introduction

What allows some children to thrive in school while others struggle to stay afloat? What factors enable some students to successfully enter middle school while others drop out during primary school? How can we account for the fact that some parents provide certain children with all the support needed to succeed in school while putting their siblings to work? How do returns to education and a child's aspirations influence enrollment decisions and academic performance? Invariably, each child's situation is unique. However, we can attempt to answer these types of questions by studying aggregate trends. In this chapter, we will review the relevant literature in order to provide a context within which to study India's post-primary education system and which helped to guide our research on the status of middle school education in rural India. Specifically, we are interested in the determinants of entry to and completion of middle school. In this literature review, we attempt to identify the most salient determinants of enrollment, dropout, and performance, devoting particular attention to children of middle school age. While the focus is on India, we also take into consideration other relevant literature not specific to middle/ secondary education or to India but which helps towards building an overall perspective on issues facing disadvantaged communities across the world in gaining access to quality school education.

In recent years, India has devoted much attention to its primary education sector. Although there is a fair amount of criticism surrounding the specifics of the law, India's 2009 Right of Children to Free and Compulsory Education Act (RTE) was nonetheless a sign of the government's firm commitment to equitable primary education. India boasts over 87.41 percent net enrollment at the primary level (State Report Card, 2014-15; U-DISE).

In stark contrast, the Indian government had paid disappointingly little attention to secondary education. Perhaps unsurprisingly, with 60 percent net enrollment in secondary

school, India lags far behind its global competitors in East Asia and Latin America, with 70 percent and 82 percent respectively (World Bank, 2009).

Public underinvestment in post-primary education coupled with growing demand has led to a vast expansion of private schools. This is unlikely to provide a sustainable solution to problems of access, given that the cost of education is a huge barrier for many families. Aware of these problems, the government of India launched Rashtriya Madhyamik Shiksha Abhiyan (RMSA) in 2009 which aims to achieve universal access to high-quality secondary education (RMSA, MHRD).

### 2.2 Household level determinants of school enrollment, dropping out and student performance

Parents or guardians arguably play the most important role in a child's educational attainment. Except in rare circumstances, young children are not free to make their own decisions, and those who are generally do not have the wherewithal to exercise sound judgment. Parents' choices regarding their children's education are shaped by numerous factors, some of which include parents' own educational attainment, a family's socioeconomic status, place of residence, cultural norms and personal preferences regarding education, accessibility and condition of school facilities, and the opportunity costs of their children's time.
Once children are enrolled in school, what factors enable them to continue within the education system? India, like many other developing countries, faces a huge problem of attrition from primary to post-primary school. Given the gravity of this problem, a number of researchers have conducted studies in different contexts to explore the reasons behind dropping out. For many children, there might not be a single event that triggers the decision to leave school. Instead, this phenomenon should be understood as a series of events and situations that ultimately leads to the decision to drop out.

In this section, we review the relevant literature to explore these themes and see which hold up best to empirical evidence. Although our focus is on India, many of the studies most pertinent to these topics are from abroad, which raises the question of external validity – in other

words, it may be naïve to assume the same result that held in another country would be true in India. It is nonetheless important to take stock of this literature to help inform research investigation into the status of post-primary education in India – specifically in an attempt to understand the predominant drivers behind dropping out so that we are better equipped to identify at-risk children and intervene where possible.

### *Family- parents*

A number of studies have attempted to explore the link between parents' and children's education. Using the Second Malaysian Family Life Survey, Lillard and Willis (1994) examined educational attainment data from 1910 to 1980, which spanned as many as four generations within a family. They found that on average, children of parents with higher levels of educational attainment received more schooling than their peers. The effect was particularly strong when disaggregated – mothers' education positively influenced that of their daughters', as did fathers' with sons' (Lillard & Willis, 1994: p. 1164). Dostie and Jayaraman (2006) found that this trend held in Uttar Pradesh and Bihar, India[7] where "school enrollment generally increases with parental education and wealth, as well as with school quality" (Dostie & Jayaraman, 2006: p. 407) and moreover, maternal education was once again a stronger predictor of girls' enrollment decisions than paternal education. A number of authors' findings concur, including Al Samarrai and Peasgood in a 1998 study in Tanzania and Brown and Park in a 2002 study in China. The latter authors calculated that for each additional year of a father's education, the probability of his child dropping out of school decreased by 12 to 14 percent. Specific to the Indian context, Usha Jayachandran (1997) as well as Dreze and Kingdon's review of the Public Report on Basic Education (PROBE) survey of Bihar, Madhya Pradesh, Rajasthan, and Uttar Pradesh (Dreze & Kingdon, 1999: p. 17) drew similar conclusions.

[7] Dostie & Jayaraman analyzed data from the 1997-1998 UP-Bihar Survey of Living Conditions. Surveyors interviewed 14,493 individuals from 2,250 households selected from 120 villages. These villages were drawn from a sample of 25 districts in south and eastern U.P. and north and central Bihar. Available from the World Bank at: http://www.worldbank.org/lsms/country/india/upbhhome.html

### *Family- size and birth order*

Booth and Key analyzed the British Household Panel Survey to investigate whether family size and birth order influence children's educational attainment. They determined that children from smaller families "achieve higher educational qualifications" (Booth & Key, 2007: p. 394) and furthermore, that younger children receive a smaller proportion of the family's education resources compared to their older siblings. Lloyd and Brandon's 1994 study of fertility and schooling in Ghana reached the same conclusion; the probability of dropping out for girls increased by 16 percentage points when comparing only children to girls with one to four siblings.

Similarly, in his sample of 701 children from 'educationally backward' administrative blocks in U.P., Gaurav Siddhu found that students from households with more school age children were less likely to transition to secondary school than peers from smaller families (Siddhu, 2011: p. 398). This problem was especially acute for families in the lowest asset index quintile, as on average, they had one more child than other families in the sample. Additionally, Siddhu found that children of older parents were less likely to transition (Siddhu, 2011: p. 298). Siddhu did not find a clear relationship between child's birth rank and transition to secondary school, except when girls were evaluated separately. In that case, younger girls were less likely to attend secondary school than their older sisters (Siddhu, 2011: p. 399).
In the Malaysian context, Lillard and Willis determined that siblings of the same sex are rivals for parent's limited resources and therefore a girl's years of schooling are reduced the more sisters she has and the same for boys and number of brothers (Lillard & Willis, 1994: p. 1164).

### *Socioeconomic factors- family financial status and parental employment*

Many other household level characteristics seem to help account for differences in enrollment patterns among children. Household wealth, generally measured using asset proxies, is commonly found to have a positive relationship with school enrollment. Dostie and Jayaraman's data revealed that number of rooms in a house had a "significant positive effect on girls' enrollment in both [age] cohorts and on boys in the older age group". Land ownership

encouraged enrollment among the younger cohorts of boys and girls while the number of bicycles was only a positive factor for boys. Conversely, livestock ownership appeared to reduce the probability that older girls were in school, which seems logical as the onus of caring for livestock often falls on girls (Dostie & Jayaraman, 2006: p. 413). Dreze and Kingdon (1999) also found that household wealth enhanced school participation and that the ownership of domestic animals significantly reduced the likelihood of girls' enrollment. Dissimilar to the former authors, land ownership did not appear to be a useful predictor for girls' enrollment.

A number of studies highlight the relationship between poverty and dropping out of school (Boyle et al., 2002; Brown & Park, 2002; Cardoso & Verner, 2007; Colclough et al., 2000, Dachi & Garrett, 2003; Hunter & May, 2003; Porteus et al., 2000). For instance, Cardoso and Verner's 2007 study of school abandonment in urban Brazil suggests that poverty, and in particular inability to pay for school, was the main reason for dropout. Additionally, many poor parents sent their children to work, which compromised their ability to attend school.

In a study on interactions between poverty, schooling, and gender in Ethiopia and Guinea, Colclough et al. (2000) found while many poor families were aware of the benefits of schooling, on average they still had lower enrollment and higher dropout rates than wealthier families because they could not afford the costs. According to Dachi and Garret (2003), in Tanzania the main barrier to sending children to school also was inability to pay. Rose and Al Samarrai (2001) reached a similar conclusion in Ethiopia – as school fees were due before the harvest season, poor agricultural families faced an added financial constraint, which lead to under enrollment and dropping out.

Father's income is particularly relevant to a child's enrollment status. Chugh's 2004 study in India's urban slums highlights the plight of underprivileged children. Her data showed that a child's retention in or withdrawal from school was linked to his or her father's income and moreover, a majority of dropout children's fathers were unemployed. In this case, parents called upon children to supplement family income by obtaining a job or taking responsibility for household chores in order to allow other family members to pursue outside work. In G. Siddhu's (2011) study on determinants that enable or restrict transition of children in rural India to

secondary schooling, more than twice as many girls dropout of schools after completing upper primary schooling (grade 8) in families where main source of income is unskilled manual labor as compared to families where main source of income is either skilled labor or farming. In addition, the study found that number of children dropping out increasing as wealth decreases. Thirty-three percent of children in the lowest wealth quintile dropped out after grade 8, while the proportion is only 3 percent for those in the highest quintile.

Arunatilake (2005) in her analysis of Sri Lanka Integrated Survey (SLIS) data found that the type of employment, and hence the income, of the head of the household was statistically significant in explaining the schooling of children. Living in a community where the main livelihood was agriculture or fishing increased the likelihood of children being out of school compared to communities where the main livelihood was employment in services. She suggested that, as agricultural communities provide more opportunities for employment, the opportunity costs of staying in school are increased for children from agricultural households.

### *Caste*

Children belonging to 'scheduled castes and scheduled tribes' and 'other backward castes' in the PROBE survey were less likely to attend school than their counterparts in the general castes– even when the authors controlled for a number of other characteristics. This was particularly relevant for girls both in terms of initial enrollment and grade attainment (Dreze & Kingdon, 1999: p. 17 & 24).

Dostie and Jayaraman, however, found mixed results regarding caste and enrollment. In their study, caste affiliation had "no significant effect on enrollment" when accounting for village-level caste composition (Dostie & Jayaraman, 2006: p. 413). However, boys aged 11-14 were more likely to be enrolled in villages with a larger proportion of high castes. In Bihar, higher caste fractionalization was "associated with a higher probability of school enrollment among members of the older cohort of both genders". Yet, this was not the case for U.P. (Dostie & Jayaraman, 2006: p. 415). Interestingly, when the authors omitted the measures of village caste composition from their analysis, belonging to a scheduled caste significantly reduced the probability that young girls were enrolled in school. As this finding is at odds with much of the

literature, Dostie and Jayaraman posit that "village caste relations, rather than individual caste identity viewed in isolation, may be more central to school enrollment" (Dostie & Jayaraman, 2006: p. 415).

In his study on the transition to secondary schooling in rural India, Gaurav Siddhu found that membership in a scheduled caste had "virtually no relationship with transition to secondary schooling" (Siddhu, 2011: p. 397). Nonetheless, when disaggregating by gender, 22 percent of scheduled caste girls in the sample dropped out versus only 14 percent of scheduled caste boys. However, as he explains, "in India only around 50% of children ever make it to grade 8, meaning that a large proportion of the disadvantaged will have already exited the system, leaving only the more motivated and/or privileged to consider whether or not to continue into secondary schooling" (Siddhu, 2011: p. 397).

### *Health, nutrition and death of family members*

Protein-energy malnutrition, hunger, and insufficient micronutrients due to an unbalanced diet have great potential to undermine a child's capability to learn (Pridmore, 2007). As a consequence, studies suggest that children suffering from these circumstances frequently miss school, struggle to pay attention, lack motivation, and are more likely to underperform, repeat grades, and drop out prematurely (Pollitt, 1990; Grantham-McGregor & Walker, 1998; Rosso & Marek, 1996).

A child's own health status, however, is just one variable that influences his or her enrollment and performance. Death or sickness among family members, and in particular parents, often puts a child at increased risk of non-enrollment, delayed enrollment, slow progress, and dropping out (Case et al., 2004; Evans& Miguel, 2004; Gertler et al., 2003; Bicego et al., 2003; Lloyd & Blanc, 1996). For many, this stems from the fact that it falls upon children to care for sick relatives or to work in their stead – be it domestic or paid.

Orphaned children are particularly vulnerable given that death is often accompanied by an unexpected shock to family income. Especially in poor households, this magnifies the risk

that a child enters the labor market and/or drops out of school (Hunt, 2008; Bennell et al., 2002). Following the death of a family member, some studies have found that subsequent access to schooling is affected by who died, with whom a child lived, the age of the child, and the child's level of education (Case & Ardington, 2004; Guarcello et al., 2004). For instance, Case and Ardington's 2004 quantitative research in South Africa highlighted differences between maternal and paternal death. Children whose mothers had died were less likely to be enrolled in school and completed fewer years of education on average than those with living mothers – these results did not hold in the case of a father's death. Similarly, a study that aimed to improve policy responses to AIDS orphans in Burundi by Guarcello et al. (2004) concluded that children who became orphans were 11 percentage points less likely to attend school full-time than non-orphans and that the death of one parent increased the chances that a child worked in an economic activity by six percentage points.

### *Gender*

On average, girls in developing and emerging market countries face greater barriers to education than boys due to customs or perceptions regarding ability, safety, and returns to education. A lot of evidence points to a son preference in many contexts. Consequently, when parents are forced to choose which child to send to school due to financial constraints, they often select male children over female (Chugh, 2011: p. 23). This may account for why some studies have determined that the price elasticity of demand for girls' education is higher than for boys' education (Glewwe & Kremer, 2005: p. 27).

Numerous studies have explored how some gendered practices in the household may influence the link between marriage and parents' investment in education (Boyle et al., 2002; Chowdhury, 1994; Colclough et al., 2000; Rose & Al Samarrai, 2001; Sengupta & Guha, 2002). Many people view girls' education as a poor investment in places where early marriage is common practice and particularly in settings such as India where women become absorbed into their husband's family after the couple weds (Sengupta & Guha, 2002: p. 1622). In such a scenario, some parents may choose not to invest in their daughters' education because they won't reap any return on investment – instead any benefits will accrue to the husband's family.

Another reason cited in the literature is that parents express concern about not finding partners for educated daughters. Colclough et al. (2000) explain that some parents in Ethiopia worried that educating daughters would reduce their capacity to perform housework and consequently compromise their chances of finding husbands. According to Chowdhury (1994), sometimes parents perceive that education changes girls' behavior, once again making marriage prospects difficult.

Furthermore, Colclough et al. (2000) – who observed married girls as young as eight years old in their sample of Ethiopian children – reported that among the married or divorced girls interviewed, almost half never had enrolled and one third had dropped out. Early marriage is especially problematic given that for many, it becomes difficult to return to school afterward (Chugh, 2011).

Teenage pregnancy is another major hindrance to school completion (Brock & Cammish, 1997; Boyle et al., 2002). For example, in Uganda, pregnancy is the second most prevalent reason for dropping out, following inability to pay (Boyle et al., 2002).

Parents commonly cite safety as a reason for keeping girls out of school. According to Alderman and King, "there is evidence that distance to schools is a more important factor for girls than boys, perhaps because parents fear exposing their daughters to moral or physical peril" (Alderman & King, 1998: p. 458). Additionally, in many societies, it is socially undesirable for girls to travel unaccompanied, particularly as they reach puberty (Siddhu, 2011: p. 397). Finally, Colclough et al. explain that gender roles in society shape the incentives for girls and boys to attend school. For example, girls may lack aspirations and motivation in settings where women have limited access to leadership positions. As a result, evidence shows that girls tend to attend less and underperform when compared to boys (Colclough et al., 2000: p. 4).

### 2.3 Provisioning: school availability and access

A number of studies have shown that distance to school is a barrier for many children and adversely affects attendance (Colclough et al., 2000; Ainsworth et al., 2005). In studies in Guinea and Ethiopia, children who lived farther away from a school were less likely to attend than those who lived close.

Many children who terminate primary education do so involuntarily because secondary schools are not available in their village. Distance is an even bigger impediment for many girls, given both their increased safety risks and their parent's perception of safety risks (Chugh, 2011). Chugh's data on dropout in secondary education living in slum areas of Delhi reveal that three percent of the families felt it was unsafe to send their children to a far-away school, seven percent of teenagers reported that they dropped out from school for fear of sexual assault during their commute, and around 40 percent of girls mentioned they were scared of walking alone when they got out of school. Alderman & King (1998) suggests that in the case of equal distances for boys and girls, there may still be a gender gap in enrollment of girls. Siddhu (2011) in his study on transition of children to secondary schooling in rural areas of Uttar Pradesh found that additional distance[8] is negatively and significantly related to transition of children from upper primary (grade 8) to lower secondary (grade 9), thus highlighting that any increase in distance that a child must travel in order to access secondary schooling is associated with a decreased chance of transition this association remains constant across models, and even across economic levels. The association is stronger for girls; though it is also negatively significant for boys.

### 2.4 Role of school (school resources, facilities, teacher absenteeism, language of instruction)

Factors within schools like resources, facilities, teaching quality, processes, and practices influence access to education. For instance, the absence of functional toilets and separate lavatory facilities for girls in some cases has contributed to children dropping out of school

[8] In G. Siddhu's (2011) study, 'additional distance' is calculated by subtracting distance to upper primary school that the child was attending from distance to the nearest secondary school.

(Chugh, 2011). Moreover, in schools with a dearth of female teachers in Ethiopia and Guinea, Colclough detected that girls stopped attending when they started menstruating. Colclough attributes this to a lack of suitable guidance and counseling from male teachers (Colclough, 2000: p. 21).

Pedagogy inside the classrooms can influence retention of students (Smith, 2003). Various studies have analyzed teacher absenteeism as a factor affecting children's academic performance (Miller et al., 2007; Finlayson, 2009), however they provide little insight into what if any contribution this makes to children dropping out. Teachers' use of corporal punishment can have extremely adverse effects on students. Boyle et al. (2002) suggest that beatings and any other form of intimidation directly reduce students' desires to attend school.

Additionally, students whose native tongue is different than the language of instruction are more prone to dropping out as they often have trouble following the teacher, which contributes to low learning levels and performance (Lynch, 2001; Jackson, 2000). Jackson's research on access to education in Burundi finds that repetition rates rose from 28 percent to 40 percent two years after French was established as the language of instruction.

Finally, Colcough et al. point out that low-quality education is associated with poor student performance, higher levels of repetition, and increased dropout rates (Colcough et al., 2000: p. 20). In particular, when parents are aware their child's school is underperforming, they may prefer to send him or her into the workforce or keep their child at home, as there will be little return on investment (Croft, 2002: 91).

In a paper titled "Schools, Teachers, and Educational Outcomes in Developing Countries", Glewwe and Kremer review a wide number of retrospective studies measuring the impact of school and teacher characteristics on learning.[9] The authors cite multiple econometric problems with these studies, which could potentially bias the studies' findings. Glewwe and Kremer find more promise in a number of more recent natural experiments and randomized

[9] Includes: Glewwe & Jacoby 1994 on Ghana; Glewwe *et.al* 1995 on Jamaica; Kingdon 1996 on India; Tan, Lane, & Coustere 1997 on the Philippines.

control trials. According to the authors, while these natural experiments and randomized trials are beginning to build a database of results that are less likely to suffer from the estimation problems that plague retrospective studies, a much larger set of results is needed before general conclusions can be drawn for policymakers. However, one interpretation of these results is that in many developing countries, the most effective means of improving school quality may be through addressing the problem of weak teaching (Glewwe & Kremer, p. 40).

### 2.5 Opportunity cost of school

The opportunity cost of school, which includes both remunerated work and non-paid activities such as housework and working in a family farm or business, is a major consideration for many children from poor families and increases with the age of a child (Hunt, 2008). The need to earn money may be particularly acute for children of deceased parents. Furthermore, many children from agricultural families face the additional constraint of the school terms clashing with agricultural cycles, contributing to prolonged absence and dropping out (Brock & Cammish, 1997: p. 71).

According to Sengupta & Guha (2002), in many circumstances, girls face higher opportunity costs than boys given societal norms that females should undertake domestic chores including caring for siblings and helping with housework. For example, in Brock and Cammish's 1997 study of the factors affecting female participation in education in Vanuatu – where girls' enrolment in primary school is below 50 percent – girls frequently were pulled out of school to take care of younger siblings.

Some researchers have suggested that a buoyant job market, which bolsters the possibility to earn good money by working, drives up the opportunity cost of school, sending children prematurely into the workforce (Dachi & Garrett, 2003; Duryea, 2003). Moreover, many children, particularly in developing countries, find jobs in the informal sector where employers do not necessarily follow laws and regulations regarding the nature of appropriate child work (Chugh, 2011).

## 2.6 Children's motivation and ability

Children face many stressors that demotivate them and compromise their ability to succeed in school. These include lack of hope for the future, financial constraints, inhospitable school environments with insufficient bathroom facilities, inadequate teachers, the view that schooling has limited economic returns, peers with low aspirations, poor nutrition and health, a dearth of role models in the community, and poor parenting (Chugh, 2011).

Underperformance and sentiments of failure increase the probability that a student will abandon his or her studies. Many students with weak academic performance who do not receive remedial attention during primary school continue to struggle as they progress to the secondary level. Therefore, poor comprehension may lead to disinterest in studies and further drop out (Municipal Corporation of Mumbai, 1990 cited in Pryor & Ampiah, 2003). Additionally, repeating a grade can be embarrassing, leading a child to feel isolated from school and miss classes frequently until finally he or she prefers to drop out. In Siddhu's study (2011), children who were overage for grade eight by at least one year were much less likely to transition than those who were of the official age. This was particularly relevant for girls – 55 percent of overage girls dropped out versus only 34 percent of overage boys. Siddhu found a significant correlation between a child's IQ test scores – as measured by a Raven test for mathematics and Hindi – and transition to secondary school. When disaggregated, the results were no longer significant for boys, but remained so for girls (Siddhu, 2011: p. 397).

## 2.7 Aspirations

Aspirations are the outcomes a person desires in absence of constraints or resource limitations (Hauser & Anderson, 1991). They are distinct from expectations, which refer to outcomes foreseen in the presence of a wide array of "environmental constraints" (Hanson, 1994). A number of researchers have identified children's aspirations as an important predictor of educational attainment (Astin, 1977; Carter, 2001; Pascarella & Terenzini, 2005). In other words, children's aspirations and the social constraints on such aspirations are both considered fundamental components of a student's expected educational attainment (Kao & Tienda, 1998).

Understanding how children form their aspirations is, therefore, paramount to fostering access to and completion of middle school in India.

### *Conceptualizing educational aspirations*

The literature on educational aspirations fits into two general theoretical approaches: the "status-attainment" and the "blocked-opportunities" frameworks. The status-attainment school attempts to explain the variation in educational aspirations on the basis of individual differences and disaggregated socioeconomic status. Within this framework, several authors have found that aspirations motivate youth to strive for academic success and hence to seek the completion of their studies (Caplan, Marcella & Whitmore, 1992). This literature emphasizes the importance of role models in the direct and indirect transmission of children's expectations and aspirations by "significant others"[10], showing that parental influence is crucial to their children's formation of aspirations (Sewell & Shah, 1968; Sewell et al., 1969, 1970; Campbell, 1983).

The blocked-opportunities school focuses on minority and non-minority differences in educational outcomes, showing how structural barriers to social resources, in addition to cultural beliefs and norms, diversify educational aspirations. Findings are not consistent and their interpretation varies accordingly. Some authors show that certain groups can overcompensate for the disadvantages of their minority group status by overachieving scholastically (Sue & Okazaki, 1990). Other authors claim that blocked opportunities can lead to educational underperformance if the group in question becomes skeptical about the value of educational success as a means to upward mobility (Fordham & Ogbu, 1986; Gibson & Ogbu, 1991).

As a side note, most of the studies on children's aspirations within the blocked-opportunities framework have focused on racial differences within the United States, without looking at other rich and diverse social contexts such as the one India presents. Additionally, much of the existing literature on educational aspirations does not address how gender

[10] "Significant others" refers to anyone who influences a child's aspirations either directly or indirectly. This could be a relative or another individual with a close relationship to the child.

differences affect socioeconomic aspirations, although there is hard evidence of persisting gender differences in scholastic and occupational attainment (Alexander & Eckland, 1974).

### *Measuring aspirations*

The first step in measuring aspirations correctly is to distinguish between two kinds of attitudes regarding educational aspirations. On the one hand, abstract attitudes are popularly held beliefs about education, including the promise of education as a means of socioeconomic mobility. These attitudes can be easily measured through open-ended general questions that will reflect the local "discourse" or social perception of education. On the other hand, concrete attitudes reflect actual experiences of a particular group and take into account obstacles to employment (Mickelson, 1990).

Children recalibrate their attitudes as they accumulate concrete scholastic experiences. For example, in sixth grade aspirations may contain mainly abstract elements given that graduation is far in the future. In middle school, some children may still be optimistic about their eventual attainment. By twelfth grade, students are probably much more realistic about their own likelihood of completing their education and hence it is more appropriate to ask about aspirations through concrete attitudes questions (Museus et al., 2010).

The mechanisms that produce high or low educational aspirations are affected by several factors. The concreteness of student aspirations may differ by race and ethnicity (Kao & Tienda, 1998). In the Indian context, we would expect that children from lower castes find it more difficult to be assertive regarding concrete attitudes questions. In this sense, as John Ogbu's 1978 study showed, existing levels of social stratification between high school students from different races in the U.S. enhanced the perceived structural limitations of less privileged youth, constituting a major barrier to their academic achievement and educational attainment.

Most of the literature on the educational aspirations and expectations of students focuses on three different types of predictors: demographic, academic, and social. Demographic factors, including socioeconomic status, race, gender, and family are sound predictors of educational

expectations and hence important determinants of educational attainment in post elementary education (Carter, 2001; Kao & Tienda, 1998; Perna & Titus, 2005; Trusty, 2002). In Kao & Tienda's 1998 economic model, both gender and socioeconomic status have significant effects on students' aspirations; students from higher socioeconomic backgrounds (higher levels of parents' educational attainment, higher levels of parent income) tended to have higher aspirations for both black and white students.

Several academic factors, including academic preparation, academic rank and test scores positively affect the formation of students' educational aspirations and expectations (Hossler & Stage, 1992; Kandel & Lesser, 1979; Trusty, 2002). In his 2002 study on African American educational expectations, Jerry Trusty found that the effects of early academic performance variables were the strongest predictors on the level of education that the participants aspire to achieve. Even variables such as hours per week spent talking with a teacher outside of class or "tutoring" other students held positive relationships to degree aspirations across different racial groups. In other words, both African American and white students take into consideration previous understanding of their academic skills and their own performance when setting aspirations (Trusty, 2002).

Regarding social predictors, there are three important actors in the construction of students' educational aspirations: teachers, parents, and peers; each of these actors can foster or hinder aspiration formation and hence alter educational attainment expectations (Qian & Blair, 1999; Sewell & Hauser, 1993). Sewell & Hauser's 1993 study supports previous cultural capital research by finding that students with high ratings of "emotional well-being" – measured through an index that takes into account parents and teacher rapport – have higher educational aspirations.

### 2.8 Returns to education

Aslam et al. (2010) used two comparative surveys of more than 1,000 households in India and Pakistan to examine the role of education in occupational attainment, the role of education in raising earnings conditional on occupation, the role of cognitive skills (literacy and numeracy) in

both occupational attainment and earnings determination, and the role of English language skills in determining earnings.

They describe large premiums to education and skill development and find evidence that this is the result of both the fact that education promotes a person's entry into more lucrative occupations and that education raises earnings within any given occupation (Aslam et al., 2010). The study also finds dramatic differences in returns to education between surveyed urban and rural areas. In rural areas, the likelihood of being an unpaid family worker or being out of the labor force actually increased with education suggesting unavailability of suitable jobs for better educated in rural areas. Female work participation – most often in agriculture or domestic work – was high. For rural women, education increased the likelihood of withdrawal from the labor force. In urban areas, the educated population accessed regular work more easily. Work participation among females, however, was low and varied little with education (Aslam et al., 2010).

The issue of gender differences in returns to education indicates that girls are at a disadvantage. In Pakistan, Aslam (2007) uncovered sizeable gender asymmetry in economic returns to education with employers exhibiting differential treatment, favoring male employees. This suggests that parents may have a rational investment motive in allocating more resources to boys than to girls within households. Kingdon's work in India also suggests that girls face overall market discrimination and lower economic incentives to invest in schooling than boys, because their education ultimately yields lower economic returns (Kingdon, 1998).

In examining returns to schooling in different occupations, Aslam et al. (2010) found that women reap significantly larger gains to education in terms of wage work compared to men. This, in part, reflects a scarcity premium since far fewer women than men are educated. The authors also uncovered especially large returns to self-employment and that education plays a productivity-enhancing and poverty reducing role in wage employment and faster growing non-farm sectors.

Employers rewarded years of schooling to a greater extent than literacy and numeracy

skills. Thus, in terms of entry into the labor market, it appears children have much to gain from education regardless of whether they are actually learning (Aslam et al. 2010). The authors calculated that the returns to education increased disproportionately at higher levels. Given that past education and labor market policies in India have tended to assume that returns to education are greatest at lower levels of education, this finding may be policy relevant. The authors also found that those who reached tertiary education had vastly increased earning potential and that the gender gaps in earnings diminished at higher levels of education.

### 2.9 Role of vocational training

Vocational training facilitates the school to work transition and delivers wage returns comparable to or greater than those of education (Riboud et al., 2006). The World Bank's 2003 report "Skill Development in India – The Vocational Education and Training System" describes India's vocational education stream as undeveloped, enrolling less than three percent of students at the upper secondary level. It also casts doubt on the value of vocational training given that graduates still find it difficult to secure employment. Majumdar (2005) also finds widespread unemployment among technical education program graduates. She elaborates that the deficiencies in Indian vocational training stem from institutional, instructional, and administrative weaknesses. According to the World Bank, "international experience suggests that employers mostly want young workers with strong basic academic skills, and not necessarily vocational skills" (World Bank, 2003; p.ii). This suggests that vocational training is most effective for older children following acquisition of basic academic abilities.

### 2.10 Conclusion

Quality secondary education has the potential to deliver enormous benefits. Beyond the direct impact of improving the employment prospects of individuals, post primary education can also produce huge gains at the societal level. In addition to improving economic growth and reducing poverty, there exist a raft of positive externalities that come with educational attainment including improved health, lower maternal and child mortality, lower population growth, and increased gender equality (World Bank, 2009).

Policy should be informed by an in-depth stock taking exercise that identifies key challenges to be addressed if quality secondary education for all is to be achieved. A review of existing literature is a first step in this process as it provides a context to guide research into the status of middle school education in rural India. One clear gap that emerges from this literature review is the absence of any research on learning outcomes of children in the middle school going age group. This research study was designed to address this important gap in the literature. Further, since learning assessments were administered at the beginning and end of the study period, it allows us to measure the extent to which a year of schooling makes a difference to children's learning levels.

In addition, through the large scale household and school survey which formed part of the empirical data collection, information has been collected on a range of factors that have emerged from the literature as having a bearing on post- primary schooling outcomes. Since the literature identified dropping out of school from primary to post- primary schooling, separate questionnaires were designed for children who are currently enrolled, drop outs and never enrolled. Additionally, since children could drop out between two academic years (that is, the baseline year of the survey- 2013 and end line year of the survey- 2014), a tracking visit was undertaken between July 2014- September 2014 to record the enrolment status of sampled children. Third, the household survey focuses on issues pertaining to access of middle schooling (with a special attention to girls' access to schooling), parental background including their education, occupation, home language, caste and economic status, sibling order, parental investment in education, child's (educational and occupational) motivation and aspirations as well as of her parents and the child's perceived return to her education. To capture the picture pertaining to the supply side, the study also conducted a school survey. The focus here is on infrastructure facilities both in the school and classroom, teaching practices as well as teachers' perceptions and attitudes.

In the baseline report (December 2013), we presented detailed findings from the household survey. Subsequent chapters present the findings from the 2014 survey. Beginning with sample details (Chapter III), we take an in- depth look into learning outcomes (Chapter IV)

and on middle schools (Chapter V). Chapter VI brings the learning outcomes, household and school side factors together in a regression framework. The analysis presented here provides an overview of the salient findings emerging from the study. The data collected is rich, and offers scope for further nuanced analysis.

# III. Sample Description

## 3.1 Data collection

As indicated in the baseline report, the first round of data collection (October 2013 – February 2014) gathered information on household, school experiences, and educational and occupational aspirations of sampled children (between grades 6 to 8 and in the age group 11- 16 years) and their parents. A total of 6,197 households were surveyed with 3,338 and 2,859 households in Nalanda and Satara respectively.[11] Learning levels of children were assessed via an ASER like floor test followed by grade appropriate tests in four subjects- state vernacular, math, science and English for children who qualified the floor tests.

Following the first round of data collection (end 2013 - early 2014), we carried out two further rounds of data collection (see Table 3.1). Children surveyed in 2013 were tracked between July and September 2014. The objective was to capture enrolment status and current grade of the sampled child. An end-line assessment was carried out between October 2014 and February 2015, in which children were assessed using exactly the same assessment tools as in the baseline assessment so as to allow for a one to one mapping of change in learning levels over a one-year period. Here too children were tested first on a qualifier floor tests. Children who cleared the floor tests were subsequently assessed on grade appropriate tests in state vernacular, math, science and English.

Furthermore, to get a holistic picture of the various factors that affect a child's learning, schools too were surveyed. In each village, the school which was attended by the most sampled children was selected for the survey. In each of these purposively selected schools, data was collected on infrastructure, classroom processes and activities and teachers- their background, teaching methods adopted by them; their attitudes and perceptions.

[11] Survey was conducted in 60 randomly sampled villages each in both the districts. The baseline report mentions 6,189 households; post data cleaning the number of sampled households is 6197.

**Table 3.1: Time-frame of various visits**

| Time-frame | Activity | Questionnaire/Test Administered |
|---|---|---|
| October 2013 – February 2014 | Household survey | Household roster and questionnaire for currently enrolled/ dropout/ never enrolled parent and child |
| | Baseline assessment | 1. Floor test in language and math<br>2. Pen and paper test in state vernacular, math, science, English |
| July 2014-September 2014 | Mid- line visit | Tracking visit |
| October 2014 – February 2015 | End-line assessment | 1. Floor test in language and math<br>2. Pen and paper test in state vernacular, math, science, English |
| March 2015-June 2015 | School visit | 1.School infrastructure<br>2.Classroom organisation<br>3.Teacher background, classroom activities, perceptions and attitudes |

## 3.2 Sample description

In the first round of survey, conducted in 2013, a total of 6,197 children were surveyed with 3,338 and 2,859 children in Nalanda and Satara respectively. Of the total 3,338 children surveyed in Nalanda in 2013, 2933 (87.89 percent) children were enrolled in school and 404 (12.11 percent) children were out of school.[12] In Satara, out of the 2859 children surveyed, 2819 (98.64 percent) children were enrolled in schools and only 39 (1.36 percent) children were out of school. Of the total 6197 children surveyed in 2013, 5921 (95.55 percent) children were tracked in subsequent rounds in 2014.

Only the children for whom information on enrolment status is available in the first round of survey (2013) have been considered for further analysis. This information is available for 6194[13] children with a total of 3,336 children in Nalanda and 2858 children in Satara.

[12] Out of school includes drop-out and never enrolled children.
[13] For 3 sampled children- 2 in Nalanda and 1 in Satara, we have no information pertaining to their enrolment status.

**Table 3.2: Sample description- visit 1 (2013) and visit 2 (2014)**

| Status in 2013 | Nalanda | | | Satara | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|
| | Surveyed in 2013 | Tracked in 2014 | % tracked in 2014 | Surveyed in 2013 | Tracked in 2014 | % tracked in 2014 | Surveyed in 2013 | Tracked in 2014 | % tracked in 2014 |
| Grade 6 | 940 | 912 | 97.02 | 901 | 888 | 98.56 | 1841 | 1800 | 97.77 |
| Grade 7 | 1043 | 1021 | 97.89 | 941 | 923 | 98.09 | 1984 | 1944 | 97.98 |
| Grade 8 | 949 | 919 | 96.84 | 977 | 959 | 98.16 | 1926 | 1878 | 97.51 |
| All enrolled | 2932 | 2852 | 97.27 | 2819 | 2770 | 98.26 | 5751 | 5622 | 97.76 |
| Out of school | 404 | 270 | 66.83 | 39 | 28 | 71.79 | 443 | 298 | 67.27 |
| Total | 3,336 | 3,122 | 93.59 | 2,858 | 2,798 | 97.90 | 6,194 | 5,920 | 95.58 |

The proportion of children tracked in 2014 in Nalanda and Satara was 93.6 percent and 97.9 percent respectively. Majority of enrolled children surveyed in 2013 were tracked in 2014. However, only small proportion of out-of-school children was tracked in 2014. Of the 404 out-of-school children surveyed in 2013 in Nalanda, 67 percent could be tracked in Nalanda; the percentage is 71 for Satara. Surveyors were asked to mention the reason in case they were not able to track the children. The primary reasons thus mentioned were that children have migrated either to other villages or another state. In Bihar, surveyors reported drop-out children moving out to work in nearby brick-kilns.

## 3.3 Transition through grades

The transition table (Table 3.3) gives a comprehensive picture of sampled children who have transitioned to appropriate grades (we would expect that children after a year would have moved a grade higher), children who have not transitioned to appropriate grades (they are either repeating a grade or have reported either a lower or higher lower than what is appropriate) and children who have dropped out of school.

**Table 3.3: Transition table**

| Grade | Surveyed in 2013 | Attrition in 2014 survey (%) | Transitioned to appropriate grade in 2014 (%) | Transitioned to lower or same grade in 2014 (%) | Transitioned to higher grade in 2014 (%) | Dropout in 2014 (%) |
|---|---|---|---|---|---|---|
| Nalanda | | | | | | |
| 6 | 940 | 2.98 | 87.45 | 3.4 | 3.3 | 2.87 |
| 7 | 1043 | 2.11 | 88.97 | 2.21 | 3.55 | 3.16 |
| 8 | 949 | 3.16 | 88.72 | 2.74 | 0 | 5.37 |
| Satara | | | | | | |
| 6 | 901 | 1.44 | 96.78 | 0.11 | 1.11 | 0.55 |
| 7 | 941 | 1.91 | 97.24 | 0.32 | 0.11 | 0.43 |
| 8 | 977 | 1.84 | 95.8 | 0.92 | 0 | 1.43 |

Table 3.3 indicates that approximately 88 percent of enrolled children surveyed in 2013 in Nalanda have transitioned to the appropriate grade; i.e., grade 6 children in 2013 have transitioned to grade 7 in 2014, grade 7 to grade 8 and grade 8 to grade 9. A small percent of sampled children have jumped two grades higher, continue to be in same grade, or have descended to lower grades. With no detention policy in place, where it is mandatory to promote all children to next grade, it is quite surprising to see children staying in the same grade or moving to lower grades. Observation from field indicate that even though children are promoted to next grade, they themselves choose to remain in same grade or move to lower grade as they find it difficult to cope with the competencies demanded by the next grade. Children have dropped out too. In Nalanda, the percentage of children who dropped out of school is higher for grade 8 (5.4 percent) as compared to grades 6 (2.8 percent) and 7 (3.2 percent). One of the reasons for dropout can be few schools have integrated upper primary and secondary sections in Nalanda (see Chapter V) and grade 8 is the transition class at the upper primary level. In Satara, by contrast, most children have transitioned to appropriate grade. The proportion of children dropping out or moving to higher or lower grades than what is expected is minimal.

## 3.4 Conclusion

This chapter summarized children's trajectories in terms of educational status in the year between baseline and endline visits. The data show that children have mostly transitioned to the expected grades (in other words, one grade higher). This is not surprising given India's no detention policy through grade 8. In subsequent chapters, we will be exploring whether transition in terms of grades correspond to better learning outcomes.

# IV. Learning Outcomes

## 4.1 Overview

Learning assessments of sampled children in the study were assessed at end line following exactly the same procedure as at baseline survey. All sampled children were first tested on a screener similar to ASER tests. Sampled children who cleared the floor tests were further administered a pen and paper based learning assessments in state vernacular (Hindi in Bihar and Marathi in Maharashtra), math, English and science. In this chapter, we present results from the assessment tests for currently enrolled children who made the grade appropriate transitions- that is, those who graduated from Grade 6 to Grade 7 (N= 1,694), Grade 7 to Grade 8 (N= 1,843) and Grade 8 to Grade 9 (N= 1,778). We begin this chapter by describing the assessment tools and process. We then discuss the results in the floor tests administered to the sampled children and the results in the pen and paper assessment tests. Finally, the chapter discusses the learning assessment results of children who did not make the grade appropriate transitions (N=173) between baseline and end line and children who dropped out of school at end line (N=134). Table 4.1 below summarizes the distribution of sampled children by their transition patterns between baseline and end line.

**Table 4.1: Transition table**

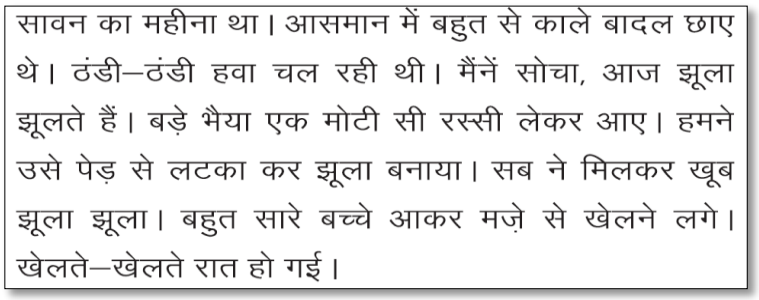
| Grade at baseline | District | N at baseline (2013) | Sampled children who transitioned to appropriate grade at end line (2014) | Sampled children who did not make grade appropriate transition at end line (2014) | Drop outs at end line (2014) | Attrition |
|---|---|---|---|---|---|---|
| 6 | Nalanda | 940 | 822 | 63 | 27 | 28 |
| | Satara | 901 | 872 | 11 | 5 | 13 |
| 7 | Nalanda | 1043 | 928 | 60 | 33 | 22 |
| | Satara | 941 | 915 | 4 | 4 | 18 |
| 8 | Nalanda | 949 | 842 | 26 | 51 | 30 |
| | Satara | 977 | 936 | 9 | 14 | 18 |
| All Grades | Nalanda | 2932 | 2592 | 149 | 111 | 80 |
| | Satara | 2819 | 2723 | 24 | 23 | 49 |

## 4.2 Assessment tools and process

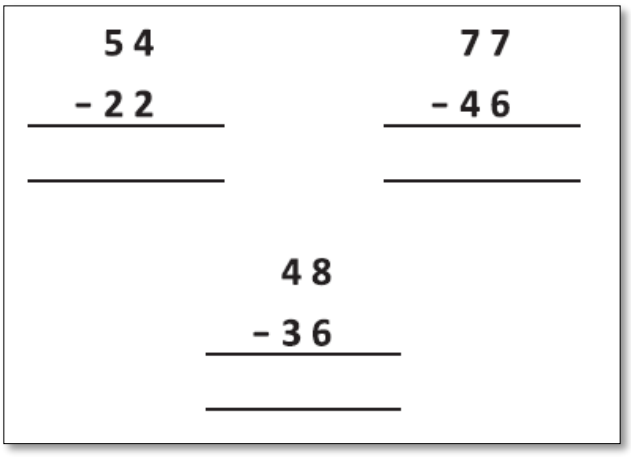
### *Floor tests in language and math*

The floor tests were closely mapped to the tools used to assess basic reading and arithmetic levels across India in the Annual Status of Education Report (ASER) surveys. The floor test in language consists of 5 levels- beginner, letters, words, paragraph that corresponds to material typically seen in Grade 1 level textbooks, and story that corresponds to a Grade 2 level text. Children were marked at their highest level at which they could read comfortably. Thus, children were categorized as "beginner (or not able to read)", "(able to read only) letters, (able to read only) words, (able to read only) paragraph, "(able to) read (story) haltingly" and "(able to) read (story) fluently". This basic test was used as a screener and only children who were able to read a story, haltingly or fluently, were further tested on basic comprehension of the story. These children- those who were able to read a story haltingly or fluently, and answered both the comprehensions questions based on the story qualified for further test in language (Hindi in Bihar and Marathi in Maharashtra), science and English.

Sample 1-Story


सावन का महीना था। आसमान में बहुत से काले बादल छाए थे। ठंडी–ठंडी हवा चल रही थी। मैंनें सोचा, आज झूला झूलते हैं। बड़े भैया एक मोटी सी रस्सी लेकर आए। हमने उसे पेड़ से लटका कर झूला बनाया। सब ने मिलकर खूब झूला झूला। बहुत सारे बच्चे आकर मज़े से खेलने लगे। खेलते–खेलते रात हो गई।

Sample 2- Subtraction problems




Children were also given a floor test in math that consisted of single-digit number recognition from 1 through 9, double-digit number recognition from 11 through 99 and two digit subtractions without borrowing. Thus, children were categorized as "nothing or (does not know any math)", "able to recognize numbers 1 through 9", "able to recognize numbers 11 through 99" and finally, "able to correctly solve subtraction problems". Children who were able to solve subtraction problems qualified for assessment in math.

Children who passed both the language and the math tests were assessed in all subjects. Table 4.2 explains the process by which the decision to administer pen and paper tests were taken, depending upon which floor test the sampled child qualified.

**Table 4.2: Representation of eligibility criteria for pen and paper assessment tests**

| Child qualified floor tests in | Paper and pen test administered in |
|---|---|
| Only language | Language, Science, English |
| Only math | Math |
| Both language and math | Language, Science, English, Math |
| None | No pen and paper tests administered |

### *Pen and paper assessments*

The pen and paper test assessed children on competencies that are covered in grades 4 to 7. So as to be able to map the change in learning level of the children over a one- year academic period, assessment tools were not changed between the baseline and end line assessments.

### *Language*

The pen and paper language assessment was designed to assess competencies in the following broad areas:

a) **Reading comprehension:** This comprised of a reading comprehension of a fictional text and a semi fictional text. Both these texts corresponded to chapters commonly found in grade 4. The former was a narrative text and the latter was informative text but in the form of a story (hence making it slightly more difficult). Both these texts had questions based on them. The questions for the first text ranged from direct retrieval to reflective and evaluative and within each from easy to difficult. The second one had questions directed at the cognitive domain of direct fact retrieval and interpretation and within each there were easy and intermediate difficulty- level questions.

b) **Vocabulary:** Vocabulary of grades 3, 4 and 5 was assessed. Within vocabulary, receptive vocabulary was assessed through a task based on matching idioms to their correct meanings and expressive vocabulary through asking the child to write antonyms of some words.

c) **Grammar and Spelling:** Grammar was assessed by tasks on punctuation, conjunction and spellings related tasks.

### *Math*

The competencies tested in the math assessment were from grades 3-7. The assessment forms consisted of items including fill in the blanks, short response and constructed response.

The cognitive domains of items were- knowing, applying and reasoning. The math assessment focused on the following competencies:

a) **Number sense**: Items in this competency included tasks of number comprehension, comparison, operations and place value and conversion from one form to another (decimal to fractions etc.). The items aligned to grades 4, 5, 6 and 7.

b) **LCM, Ratio and Proportion**: The items in this competency included computing and solving word problems.

c) **Geometry**: The items in this competency included identification, comparison and computations based on properties of angles and triangles.

d) **Mensuration and Measurement**: The items in this competency included conversion and solving word problems.

e) **Algebra**: The items in this competency included formulating equations and solving word problem.

### *Science*

The science assessment was aimed at assessing formal knowledge aligned to the curriculum and scientific thinking. Consistent themes and topics in science curriculum that occur across grades 4-7 were selected for the assessments. The rationale for having all items in the test as multiple choice items and performance tasks was that majority of children have limited writing skills and abilities. Also, performance task were aimed at assessing scientific abilities like observation, inference and integration. The topics and themes chosen for assessments were:

- Plants, animals and the living word
- Food
- Water
- Natural resources and phenomenon

Science content knowledge on the selected themes appropriate for grades 4-7 was assessed. Each topic or theme had equal number of items aligned to the various cognitive skills. Assessment items were aligned to the following cognitive domains.

| Level 1 – Knowing | Level 2- Applying | Level 3- Reasoning |
|---|---|---|
| Recall/Recognize<br>Define<br>Describe<br>Illustrate with Examples | Compare/Contrast/Classify<br>Use Models<br>Relate<br>Interpret<br>Information<br>Find Solutions<br>Explain | Analyze<br>Integrate/Synthesize<br>Hypothesize/Predict<br>Design<br>Draw<br>Conclusions |

### *English*

English is generally introduced slightly late in the school years; therefore the design of items was different as compared to other subject assessments. The aim for having a new item design that included elementary competencies was to provide ample opportunities to children to showcase their abilities in second language acquisition. The English language assessments focused on the following competencies:

a) **Alphabet and Word:** Knowledge of alphabets and easy words were assessed through a dictation task.

b) **Reading comprehension:** A narrative text with graphic stimulus was included to test their comprehension skills. This text corresponded to grade 2-3 level. The items based on this text aligned to cognitive levels- retrieve, interpret and assess and integrate.

c) **Vocabulary:** The receptive vocabulary was tested by comprehending meaning of a word from the text.

d) **Writing and Grammar:** Sentence construction with correct grammar was tested by a task which involved writing sentences describing a picture.

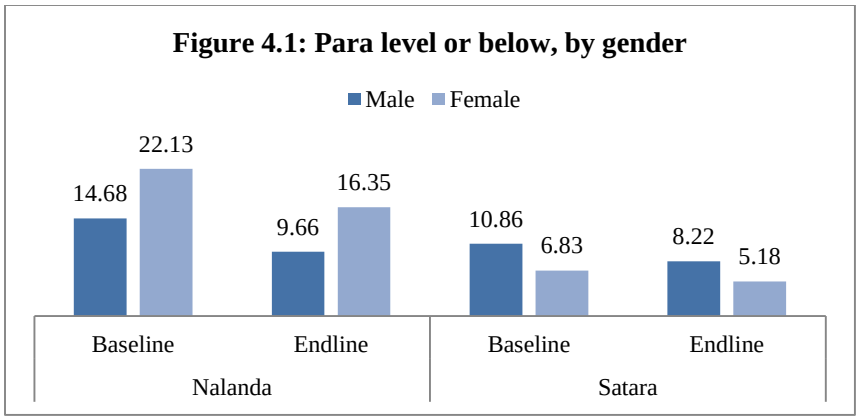
### 4.3 Performance in floor tests in language and math

The discussion on performance of children in floor tests is presented in two sections. The present section (Section 4.3) discusses performance of sampled children who made grade appropriate transitions in floor tests at end line and makes overall comparisons with baseline. This is followed by Section 4.4 below which presents a comparative assessment of the performance of children at end line floor test vis-à-vis their performance at baseline floor test.

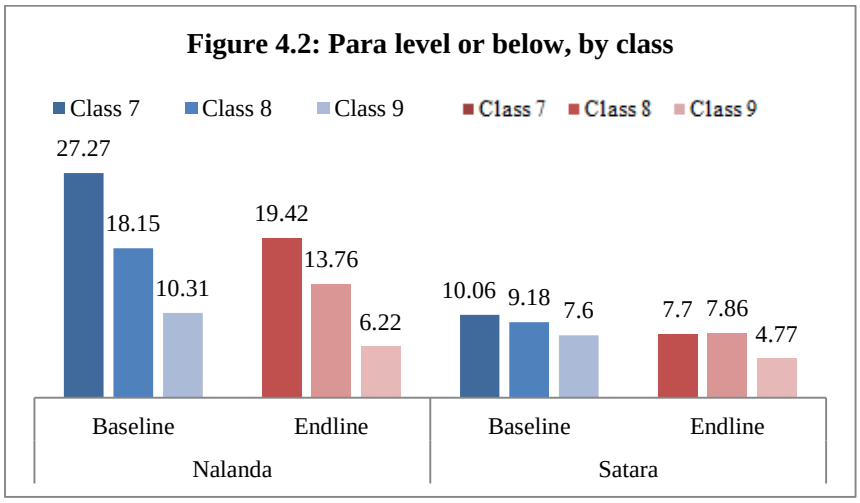
#### *Language*

Figures 4.1 and 4.2 below illustrate basic language proficiency of sampled enrolled children at baseline and at end line by gender and grade respectively. Around 18.5 percent in Nalanda and 8.9 percent in Satara, who made grade appropriate transitions, were at paragraph level and below at baseline. The corresponding percentages at end line are 13.1 percent for Nalanda and 6.8 percent for Satara. This means that even at the upper primary level there are children who despite lacking foundational reading skills, continue to move smoothly through the school system.

In Nalanda, the percentage of girls at ‘paragraph level or below’ is higher than boys at both baseline and end line assessments. Although the percentage of children at “paragraph level or below” is lower in the end line than at baseline, the gender gap persists (a 5.02 and 5.78 percentage point difference at baseline and end line respectively). In Satara, on the other hand, fewer girls than boys are at ‘paragraph level and below’ in baseline and end-line assessment.




The class-wise distribution of children at 'para level or below' (Figure 4.2) shows a sharper decline for Nalanda than Satara at baseline and end line (for example, there is a 7.9 percentage point decline in the proportion of children at 'number recognition or below' who were in Class 6 at baseline and have graduated to Class 7 at end line; the corresponding percentage for Satara is about 2.36 percentage points).

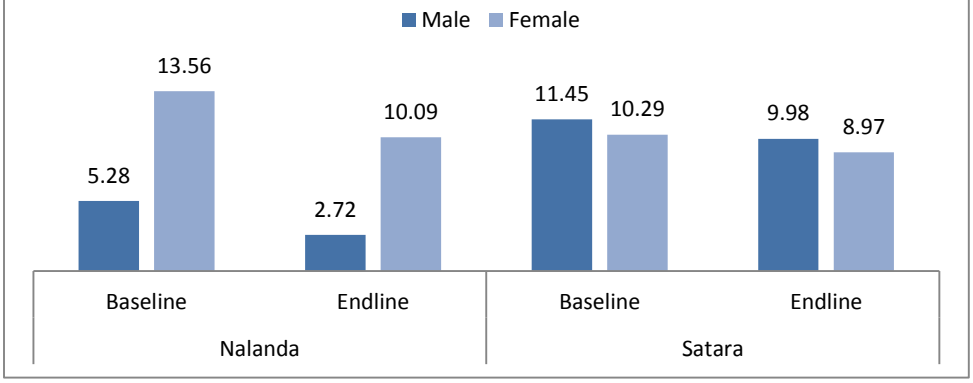



### *Math*

About 9.5 percent of children in Nalanda and 10.9 percent in Satara were at 'number recognition level or below' at the baseline. The corresponding percentages are 6.5 for Nalanda and 9.5 for Satara at end line. Figures 4.3 and 4.4 below illustrate children who are at 'number recognition or below' by gender and current class respectively for the study districts.

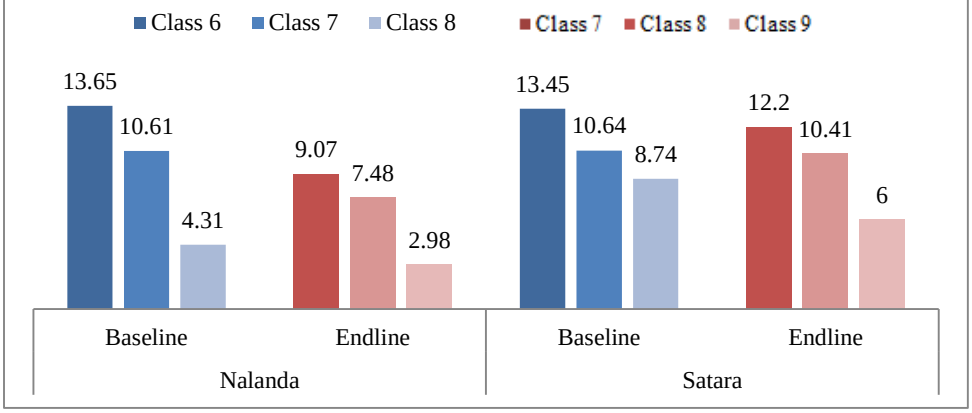
In Nalanda, a higher proportion of girls than boys are at ‘number recognition level or below’. The percentage declines in the end line- about 2.6 percentage points for girls and 3.5 percentage points for boys. In Satara, girls are at par with boys in the math screener test.

**Figure 4.3: Number recognition or below, by gender**




The class-wise distribution of children at ‘number recognition level or below’ (Figure 4.4) shows a sharper decline for Nalanda than Satara at baseline and end line (for example, there is about 4.58 percentage points decline in the proportion of children at ‘number recognition or below’ who were in Class 6 at baseline and have graduated to Class 7 at end line; the corresponding percentage for Satara is about 1.35 percentage points) partly because the percentage of children who did not qualify math floor test was more in Nalanda as compared to Satara at baseline. However, at end line, proportion of children who did not qualify Math floor test was higher for Satara than Nalanda. Nevertheless, despite the fact that the percentage of children at number recognition level is quite low, the fact that there exist children at upper primary level who cannot do simple subtraction is rather appalling.

**Figure 4.4: Number recognition or below, by class**




Overall, fewer children failed to qualify the screener at end line than at baseline. Additionally, drawing from both the assessments, the children in Nalanda have performed better in math floor test as compared to language floor test. In contrast in Satara, children seem to be proficient in language than math.

## 4.4 Performance of children at end line floor test vis-a-vis their performance at baseline floor test

### *Language*

The table below compares the performance of children at end line floor test with their performance at baseline. Of the children who did not qualify the language floor test in baseline (N= 505 for Nalanda and N=209 for Satara), majority (49.9 percent in Nalanda and 61.7 percent in Satara) did not qualify the end-line language floor test. Nearly all children who qualified baseline floor test also qualified the end line except for 3.8 percent children in Nalanda and 1.7 percent in Satara who did not qualify the end-line floor test.

Similarly, Table 4.4 compares the performance of children at end line math floor test with their performance at the baseline floor test. In Nalanda, of children who did not qualify the baseline floor test (N=218), 57 percent qualified the end-line floor test and 44 percent failed to qualify the end-line floor test. The corresponding percentages for Satara are 40.8 percent and

59.2 percent respectively (N=245). On a positive note, most of the children who qualified baseline floor test also qualified end-line floor test (97 percent in Nalanda and 96.2 percent in Satara).

The 'no-detention' policy as per RTE guidelines allows children to transition to next grade irrespective of their performance in the current grade. However, for children who do not even have foundational skills, learning deficits are bound to accumulate. In this respect, the learning gaps seem to be more persistent in Satara than in Nalanda – while Satara had fewer children who were unable to clear the screener test, a larger proportion of these were unable to acquire these foundational skills a year later.

**Table 4.3: Performance in language floor test- Baseline and End-line**

| Particulars | Nalanda | | | Satara | | |
|---|---|---|---|---|---|---|
| | Did not qualify *end-line* floor test | Qualified *end-line* floor test | Total | Did not qualify *end-line* floor test | Qualified *end-line* floor test | Total |
| Did not qualify *baseline* floor test | 49.90 (252) | 50.10 (253) | 100 (505) | 61.72 (129) | 38.28 (80) | 100 (209) |
| Qualified *baseline* floor test | 3.75 (66) | 96.25 (1695) | 100 (1761) | 1.69 (37) | 98.31 (2148) | 100 (2185) |
| Total | 14.03 (318) | 85.97 (1948) | 100 (2266) | 6.93 (166) | 93.07 (2228) | 100 (2394) |

**Table 4.4: Performance in math floor test- Baseline and End-line**

| Particulars | Nalanda | | | Satara | | |
|---|---|---|---|---|---|---|
| | Did not qualify *end-line* floor test | Qualified *end-line* floor test | Total | Did not qualify *end-line* floor test | Qualified *end-line* floor test | Total |
| Did not qualify *baseline* floor test | 44.04 (96) | 56.96 (122) | 100 (218) | 59.18 (145) | 40.82 (100) | 100 (245) |
| Qualified *baseline* floor test | 3.03 (62) | 96.97 (1,986) | 100 (2,048) | 3.82 (82) | 96.18 (2,067) | 100 (2,149) |
| Total | 6.97 (158) | 93.03 (2,108) | 100 (2,266) | 9.48 (227) | 90.52 (2,167) | 100 (2,394) |

### *Gender and class wise performance in floor tests*

Figures 4.5 and 4.6 gives a comparative picture of gender and class wise performance in floor tests in both the study districts. The gender gap in basic language and math proficiency that we observed in Nalanda is reflected in that fewer girls than boys have qualified both the language and math floor tests. In Satara, the percentage of girls not qualifying any of the tests is lower as compared to boys. This trend holds for both baseline and end line floor tests. The percentage of children qualifying both language and math floor tests increases with grade and the percentage of children qualifying only math or none of the tests declines with the grade (Figure 4.6). Partly because Nalanda had a larger number of children who had not qualified the floor tests, district wise comparisons indicate that the increase in percentage of children qualifying both language and math floor test is modest in Satara than Nalanda (about 8.7 percentage points increase in Nalanda and 3 percentage points increase in Satara).

**Figure 4.5: Gender-wise performance in floor test: Baseline and End line**

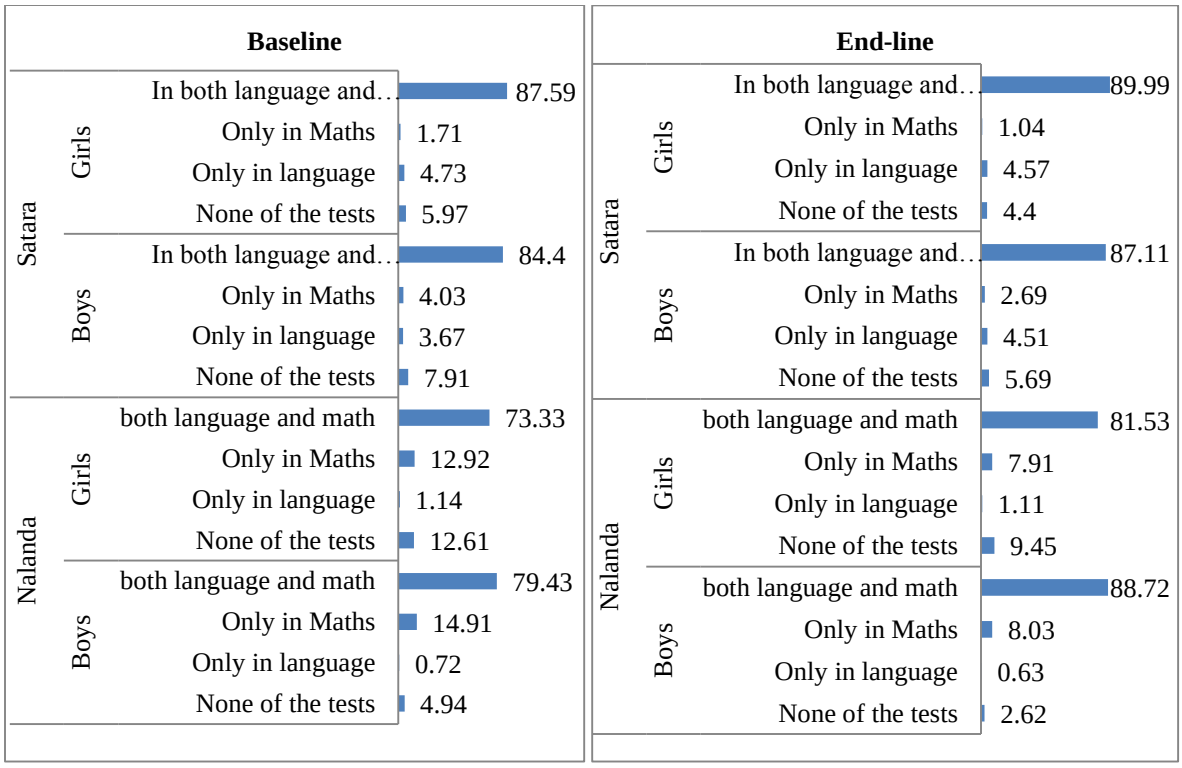
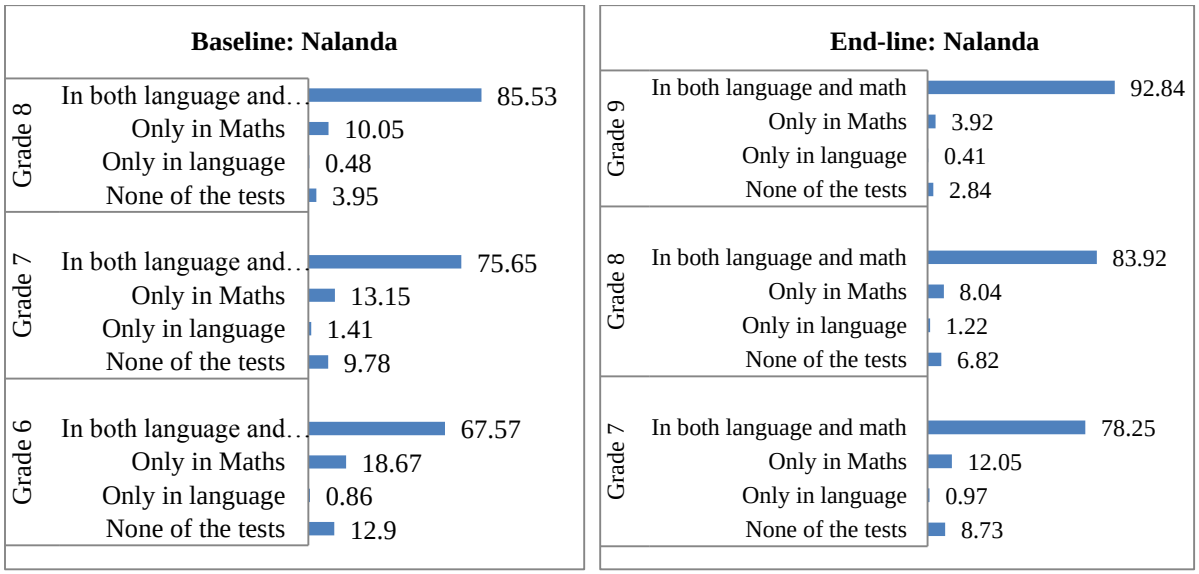
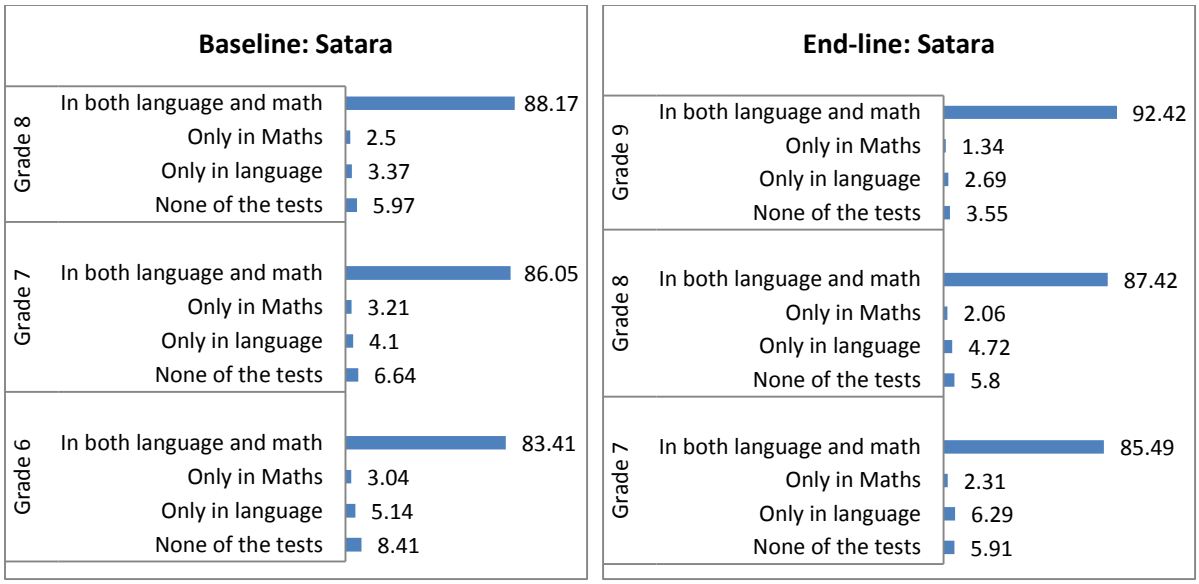



**Figure 4.6: Class-wise performance in floor test: Baseline and End line**






### 4.5 Sample details of children who qualified for the pen and paper tests

Table 4.5 below gives details of total sampled children who should have taken the test, total children who cleared the floor tests in language and math and hence, were eligible for the pen and paper tests, and the number who actually appeared for the tests. As the table illustrates not all children eligible for a particular test appeared for it. This is due to two main reasons. First, pen and paper tests were voluntary and not all children turned up for the tests in spite of best efforts of field investigators. Tests were usually administered on a weekend and as a result few children were not in the village when they were administered. Second, the order of the tests matters too. For example, language tests were typically administered first on the first of two-days of tests. Children often left after giving the language tests and did not stay back for the subsequent English test. Similarly, for math and science test on the second day.

**Table 4.5: Sample description of children who qualified and appeared for the test**

| Particulars | Baseline | | | | End-line | | |
|---|---|---|---|---|---|---|---|
| | Children who should have taken the test | Appeared for qualifier | Number of children who qualified floor test | Number of students who appeared for test | Appeared for qualifier | Number of children who qualified floor test | Number of students who appeared for test |
| Language, By District | | | | | | | |
| Nalanda | 2,592 | 2,568 | 1,985 | 1,816 | 2,282 | 1,961 | 1,872 |
| Satara | 2,723 | 2,680 | 2,415 | 2,057 | 2,424 | 2,255 | 2,123 |
| Language, By Class | | | | | | | |
| Class 6 | 1,694 | 1,669 | 1,315 | 1,196 | 1,500 | 1,287 | 1,245 |
| Class 7 | 1,843 | 1,824 | 1,523 | 1,337 | 1,648 | 1,461 | 1,379 |
| Class 8 | 1,778 | 1,755 | 1,562 | 1,340 | 1,558 | 1,468 | 1,371 |
| Math, By District | | | | | | | |
| Nalanda | 2,592 | 2,562 | 2,318 | 2,126 | 2,271 | 2,123 | 2,008 |
| Satara | 2,723 | 2,672 | 2,381 | 2,171 | 2,421 | 2,191 | 2,063 |
| Math, By Class | | | | | | | |
| Class 6 | 1,694 | 1,668 | 1,442 | 1,350 | 1,496 | 1,336 | 1,281 |
| Class 7 | 1,843 | 1,816 | 1,623 | 1,485 | 1,642 | 1,495 | 1,409 |
| Class 8 | 1,778 | 1,750 | 1,634 | 1,462 | 1,554 | 1,483 | 1,381 |
| Science, By District | | | | | | | |
| Nalanda | 2,592 | 2,568 | 1,985 | 1,793 | 2,282 | 1,961 | 1,830 |
| Satara | 2,723 | 2,680 | 2,415 | 2,081 | 2,424 | 2,255 | 2,064 |
| Science, By Class | | | | | | | |
| Class 6 | 1,694 | 1,669 | 1,315 | 1,190 | 1,500 | 1,287 | 1,210 |
| Class 7 | 1,843 | 1,824 | 1,523 | 1,341 | 1,648 | 1,461 | 1,356 |
| Class 8 | 1,778 | 1,755 | 1,562 | 1,343 | 1,558 | 1,468 | 1,328 |
| English, By District | | | | | | | |
| Nalanda | 2,592 | 2,568 | 1,985 | 1,798 | 2,282 | 1,961 | 1,772 |
| Satara | 2,723 | 2,680 | 2,415 | 2,014 | 2,424 | 2,255 | 2,074 |
| English, By Class | | | | | | | |
| Class 6 | 1,694 | 1,669 | 1,315 | 1,164 | 1,500 | 1,287 | 1,197 |
| Class 7 | 1,843 | 1,824 | 1,523 | 1,322 | 1,648 | 1,461 | 1,335 |
| Class 8 | 1,778 | 1,755 | 1,562 | 1,326 | 1,558 | 1,468 | 1,314 |

The table also illustrates a difference in the number of children who should have appeared for the qualifier in the baseline and end line. Fewer children appeared for the qualifier at end line than at baseline. This was due to a couple of reasons. First was general attrition –

some children had moved away between the baseline and the end line. Second, during the baseline, the investigators spent a lot more time in the household and village (about a week) administering the household, parents and child surveys. As a result, they were able to administer the one-on-one screener even to children who were not present when they first started the survey, but who were asked to come home later. At the end line, because of limited time, it is possible that some children could not be located.

Fewer children appeared for the English and math pen and paper test at the end line in Nalanda and for science and math pen and paper test at end line in Satara. Here again, we have general attrition. In addition, the voluntary nature of the assessment coupled with the way it was administered resulted in some children not showing up for the assessment or leaving before completing both subjects. However, note that the number of children taking language and science pen and paper test at the end line is higher compared to the baseline in Nalanda. In Satara, number of children taking language and English pen and paper test at the end line is higher than the corresponding numbers at the baseline.

## 4.6 Performance in pen and paper tests

### *Language*

Table 4.6 illustrates district and class wise mean and median percentage scores in language. The distribution of the scores are depicted in Figure 4.7a-4.7c. The salient points that emerge are as follows:

1. Children do learn as they proceed to higher grades. This can be seen by the rightward shift of the score distributions as well as the higher means. However, while the differences are significant for the mean, they are not so for the median.
2. While children in Satara did better than those in Nalanda in both the baseline and the endline and across all grades, the relative improvement in their scores was not as much.
3. Even though, the language pen and paper test had items from grades 4 to grade 7, half the children in grade 8 had a score less than 67 percent in Satara and 60 percent in Nalanda.

**Table 4.6: Summary distribution of language scores, by enrolled class and district**

| Language | | | | |
|---|---|---|---|---|
| Particulars | Nalanda | | Satara | |
| | Baseline | End line | Baseline | End line |
| Baseline Grade 6, End line Grade 7 | | | | |
| N | 518 | 557 | 678 | 688 |
| Mean | 39.02 | 48.93*** | 44.33 | 52.74*** |
| Median | 36.67 | 50.00 | 43.33 | 53.33 |
| Baseline Grade 7, End line Grade 8 | | | | |
| N | 655 | 670 | 682 | 709 |
| Mean | 44.99 | 54.40*** | 50.37 | 58.40*** |
| Median | 43.33 | 56.67 | 53.33 | 63.33 |
| Baseline Grade 8, End line Grade 9 | | | | |
| N | 643 | 645 | 697 | 726 |
| Mean | 48.81 | 56.21*** | 53.42 | 61.62*** |
| Median | 50.00 | 60.00 | 53.33 | 66.67 |
| All grades | | | | |
| N | 1816 | 1872 | 2057 | 2123 |
| Mean | 44.64 | 53.40*** | 49.41 | 57.66*** |
| Median | 43.33 | 53.33 | 50.00 | 60.00 |

*** p < 0.01, ** p < 0.05, * p < 0.10; two- tailed test, mean score (End-line)> mean score (Baseline)

**Figure 4.7a: Language score: Kernel distribution plot (Baseline: Grade 6 and End-line: Grade 7)**

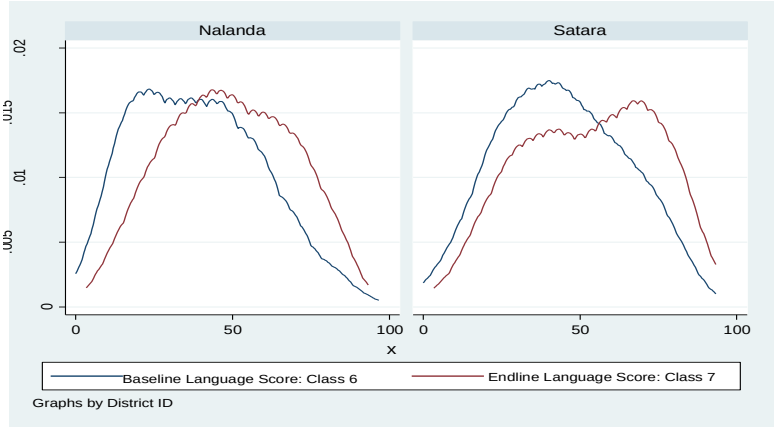


**Figure 4.7b: Language score: Kernel distribution plot (Baseline: Grade 7 and End-line: Grade 8)**

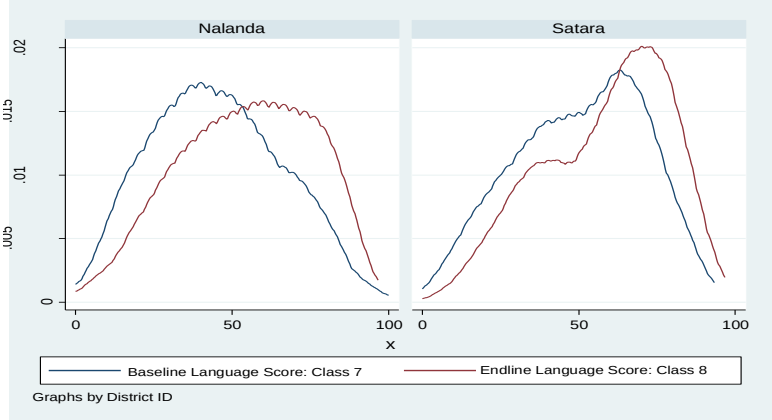
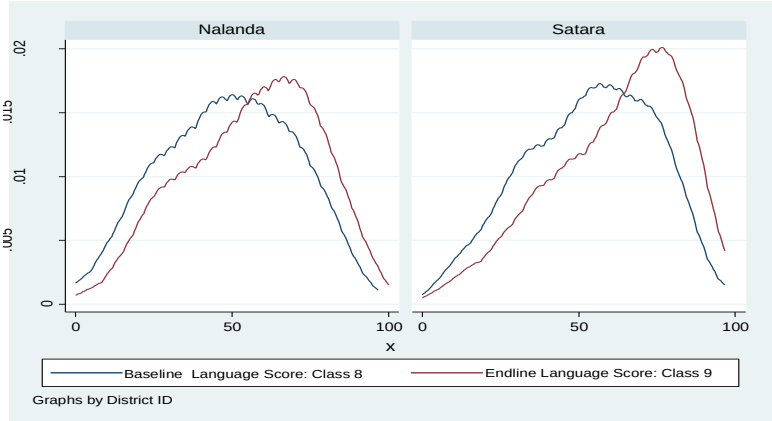



**Figure 4.7c: Language score: Kernel distribution plot (Baseline: Grade 8 and End-line: Grade 9)**



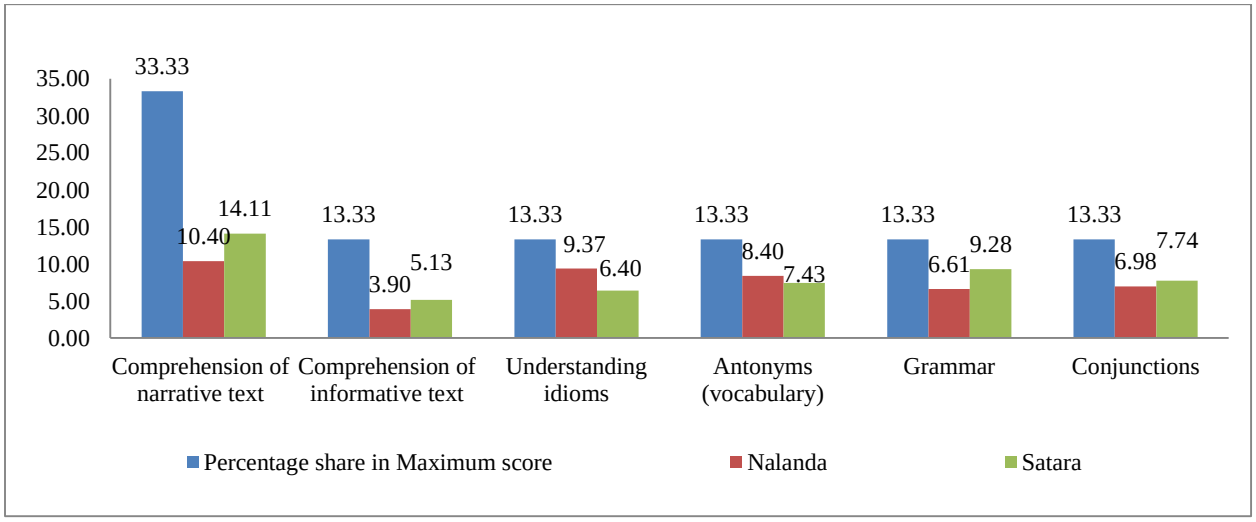

To try to identify where the gaps are we decompose the language score into the various competencies that it is comprised of – comprehension of narrative text, comprehension of informative text, understanding of idioms, vocabulary, grammar and conjunctions (Figure 3.8 below). The blue bar in the figure gives the weightage of each competency in the total score, while the burgundy and green bars respectively provide the *actual* share of each competency categories in the mean percentage scores in each of the districts. The sum of the blue bars is 100, and the sum of the burgundy and green bars is the mean score in Nalanda and Satara, respectively. So, for example, if a student scored a 100 percent, her score bars would coincide with the blue bars. However, if she scored say a 50 percent, this 50 percent could be distributed in a variety of different ways. For example, it is possible to a get a 50 percent score by getting all the antonym, grammar and conjunction items correct and 75 percent of the idiom items correct. In that case, she would have not scored anything items correct in the comprehension

sections and her decomposed score would clearly show that. Therefore, the distance between the blue and the other bars indicate how the students fared in each of the competencies.[14]

**Figure 4.8: Competency-wise share in the mean scores in language**

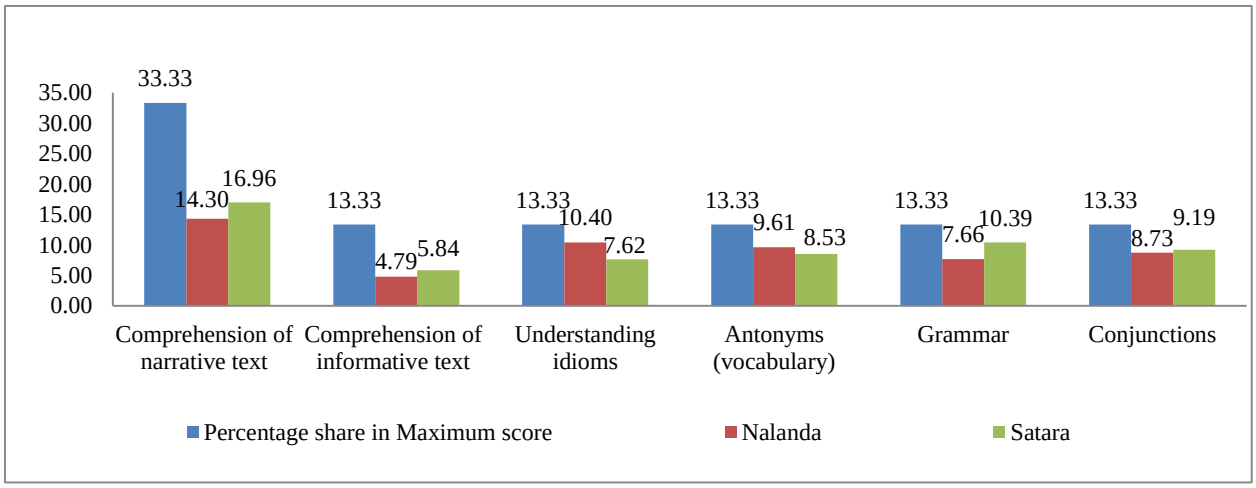
Baseline: Language

Mean percentage baseline language score: Nalanda- 45.67and Satara- 50.10




End line: Language

Mean percentage end line language Score: Nalanda- 55.48 and Satara- 58.53




[14] The sample for competency-wise share in mean percentage score comprises of grade appropriate children who attempted particular competencies at both baseline and end line assessments.

Figure 4.8 indicates children have done well in understanding of idioms, vocabulary, grammar and conjunctions, but not so well in competencies that required comprehension whether narrative or informative text. The overall language mean score has increased in the end-line test as children transitioned from grade 6 to grade 7, grade 7 to grade 8 and grade 8 to grade 9. Hence, we observe increase in competency-wise share in the end-line language mean score. However, the composition of competencies in overall mean score remains the same in both the districts across baseline and end line. This implies that certain concepts which are unclear to a child in the current grade remain unclear even if the child transitions to next grade.

### *Math*

Table 4.7 indicates that overall math mean score has increased significantly in Nalanda from 44.1 percent at baseline to 56.1 percent at end line- a difference of about 12 percentage points. Likewise, there is an increase in overall mean score in Satara as well- from 39.6 percent at baseline to 47 percent at end line, a difference of 7.4 percentage points. There is significant increase in end line scores as compared to baseline score in both the districts across all the grades. This improvement is clearly visible in the math score distribution plots in Figures 4.9a-4.9c where the end line distribution has shifted to the right in both districts and across all grades. Students in Nalanda have performed better than Satara across all grades in both baseline and end line assessment. Indeed, in Satara the median does not touch 50 percent at both the assessment points. The difference in overall percentage mean score between Nalanda and Satara further increases at end line. At the time of the baseline assessment, the difference in overall mean percentage scores between Nalanda and Satara was 4.5 percentage points. At the time of end line assessment, the difference increased to 9.2 percentage points.

**Table 4.7: Summary distribution of math scores, by enrolled class and district**

| Particulars | Nalanda | | Satara | |
|---|---|---|---|---|
| | Baseline | End line | Baseline | End line |
| Baseline Grade 6, End line Grade 7 | | | | |
| N | 644 | 627 | 706 | 654 |
| Mean | 38.27 | 50.59*** | 35.79 | 43.16*** |
| Median | 38.46 | 52.31 | 33.85 | 41.54 |
| Baseline Grade 7, End line Grade 8 | | | | |
| N | 752 | 718 | 733 | 691 |
| Mean | 44.20 | 56.77*** | 40.57 | 46.82*** |
| Median | 44.62 | 56.92 | 38.46 | 44.62 |
| Baseline Grade 8, End line Grade 9 | | | | |
| N | 730 | 663 | 732 | 718 |
| Mean | 49.20 | 60.72*** | 42.32 | 50.57*** |
| Median | 49.23 | 61.54 | 41.54 | 49.23 |
| All grades | | | | |
| N | 2126 | 2008 | 2171 | 2063 |
| Mean | 44.12 | 56.14*** | 39.61 | 46.97*** |
| Median | 43.08 | 56.92 | 36.92 | 44.62 |

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$; two- tailed test, mean score (End-line)> mean score (Baseline)

**Figure 4.9a: Math Score: Kernel distribution plot (Baseline: Grade 6 and End-line: Grade 7)**

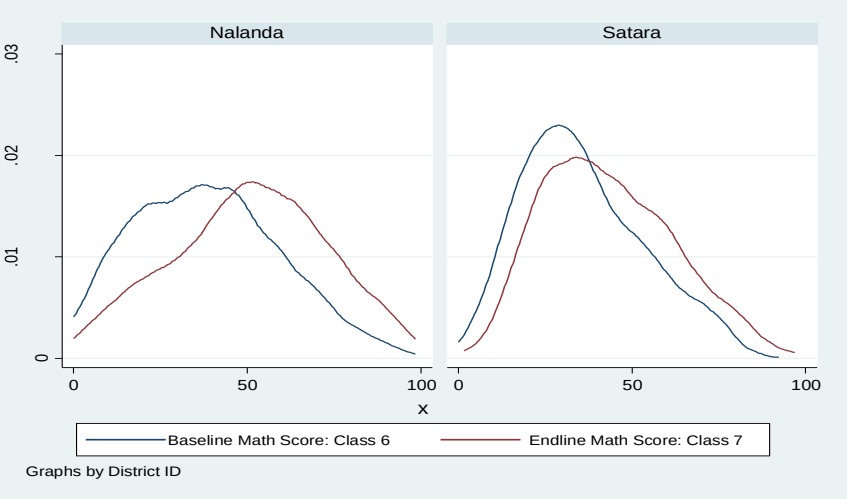



**Figure 4.9b: Math Score: Kernel distribution plot (Baseline: Grade 7 and End-line: Grade 8)**

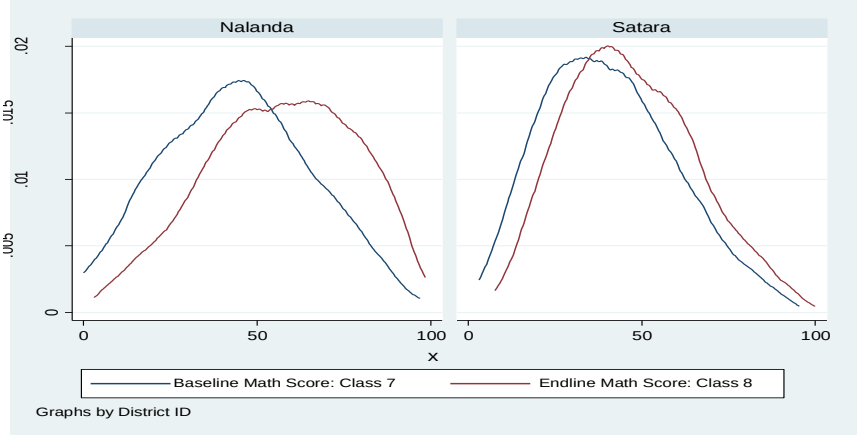
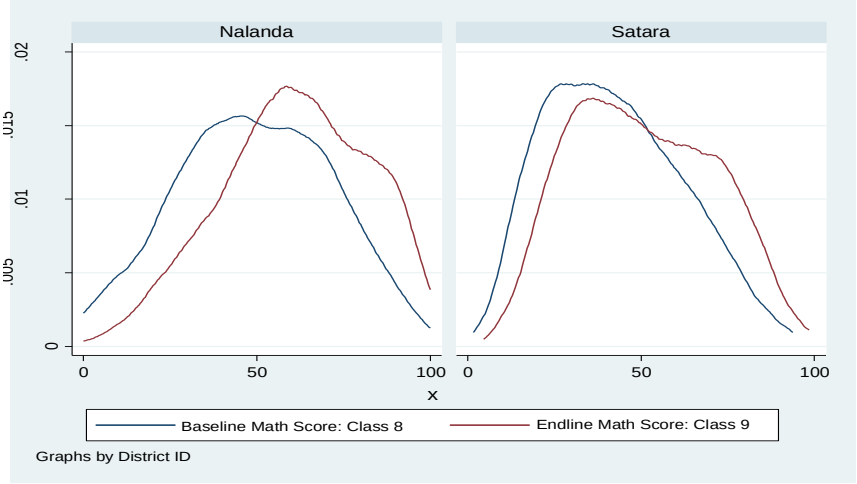



**Figure 4.9c: Math Score: Kernel distribution plot (Baseline: Grade 8 and End-line: Grade 9)**



As in the case of language, we decompose the math score to check which competencies children are lagging behind in. Table 4.8 below provides decomposition of scores by competency categories in math, which include basic competencies such as understanding numbers or number sense, ability to do basic mathematical operations as well as advanced math skills such as solving algebra problems.

The increase in the overall math score between the baseline and endline is distributed across all competencies in both Nalanda and Satara. However, while children seem to grasp the basic principles, there are large gaps in their understanding of more advanced competencies like fractions, ratios and algebra. Further, as observed in the case of language, the percentage share of various competency categories in overall scores remain the same at both baseline and end line indicating that children transition across grades with limited gains in understanding concepts that they found difficult in the first place.

**Table 4.8: Competency-wise share in the mean scores in math**

| Competency | Max. score | Weights | Percentage share in Mean score | | | |
|---|---|---|---|---|---|---|
| | | | Nalanda | | Satara | |
| | | | Baseline | Endline | Baseline | Endline |
| Numbers | 7 | 10.77 | 7.00 | 7.89 | 7.58 | 8.22 |
| Basic mathematical operations | 7 | 10.77 | 5.19 | 6.24 | 4.26 | 4.96 |
| Basic mathematical operations (Word Problems) | 3 | 4.62 | 2.13 | 2.64 | 2.15 | 2.52 |
| LCM | 1 | 1.54 | 0.97 | 1.08 | 0.19 | 0.19 |
| Number pattern recognition | 3 | 4.62 | 2.63 | 3.31 | 2.53 | 3.03 |
| Number system (Fractions and decimals) | 10 | 15.38 | 6.64 | 8.38 | 6.33 | 7.67 |
| Mathematical operations (Fractions and decimals) | 6 | 9.23 | 4.24 | 5.22 | 2.79 | 3.14 |
| Geometry | 12 | 18.46 | 8.69 | 11.28 | 8.83 | 10.50 |
| Measurement units | 3 | 4.62 | 3.32 | 3.87 | 2.54 | 2.90 |
| Mensuration | 3 | 4.62 | 1.12 | 1.71 | 0.69 | 1.03 |
| Ration and percentages | 5 | 7.69 | 1.82 | 2.92 | 1.18 | 1.73 |
| Algebra | 5 | 7.69 | 1.91 | 3.13 | 1.58 | 2.13 |
| Total | 65 | 100.00 | 45.66 | 57.68 | 40.65 | 48.01 |

### *Science*

In science assessment, children in Nalanda have a mean score of less than 50 percent at both baseline (41.7 percent) and end line (46.1 percent). In Satara, children have performed better with a mean score of 48.8 percent in baseline and 53.8 percent in end line. This improvement in mean score is seen across all grades in both districts, with the increase being statistically significant (Table 4.9). It is also reflected in the rightward shift in the score distributions (Figure 4.10a-4.10c). The Nalanda, score distribution is slightly skewed to the right for all the grades, with mean greater than the median. More than half of the children in Nalanda scored below 42 percent in baseline and 46 percent in end line assessment. Satara, on the other hand, has a close to normal distribution of science scores.

**Table 4.9: Summary distribution of science scores, by enrolled class and district**

| Particulars | Nalanda | | Satara | |
|---|---|---|---|---|
| | Baseline | End line | Baseline | End line |
| Baseline Grade 6, End line Grade 7 | | | | |
| N | 507 | 545 | 683 | 665 |
| Mean | 37.42 | 42.93*** | 43.84 | 49.68*** |
| Median | 35.29 | 41.18 | 42.65 | 50.00 |
| Baseline Grade 7, End line Grade 8 | | | | |
| N | 644 | 659 | 697 | 697 |
| Mean | 41.98 | 46.93*** | 49.09 | 54.36*** |
| Median | 39.71 | 45.59 | 48.53 | 54.41 |
| Baseline Grade 8, End line Grade 9 | | | | |
| N | 642 | 626 | 701 | 702 |
| Mean | 44.77 | 48.02*** | 53.35 | 57.19*** |
| Median | 42.65 | 47.06 | 52.94 | 58.82 |
| All grades | | | | |
| N | 1793 | 1830 | 2081 | 2064 |
| Mean | 41.69 | 46.11*** | 48.80 | 53.81*** |
| Median | 39.71 | 45.59 | 48.53 | 53.68 |

*** p < 0.01, ** p < 0.05, * p < 0.10; two- tailed test, mean score (End-line)> mean score (Baseline)

**Figure 4.10a: Science Scores: Kernel distribution plot (Baseline: Grade 6 and End-line: Grade 7)**

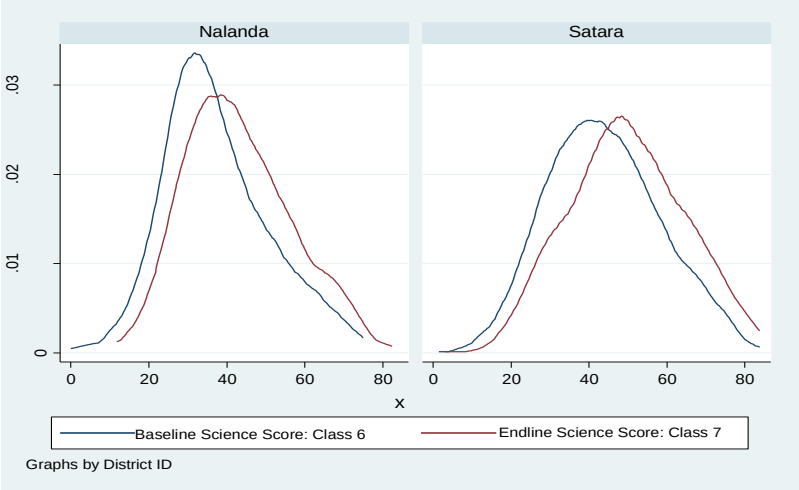



**Figure 4.10b: Science Scores: Kernel distribution plot (Baseline: Grade 7 and End-line: Grade 8)**

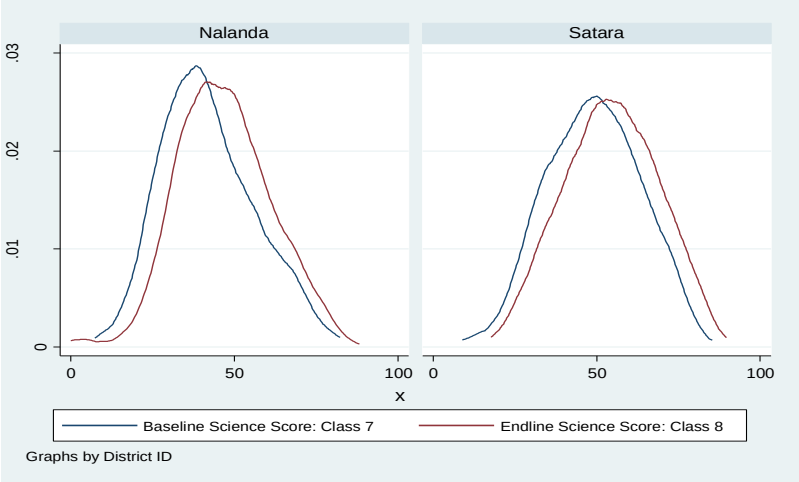
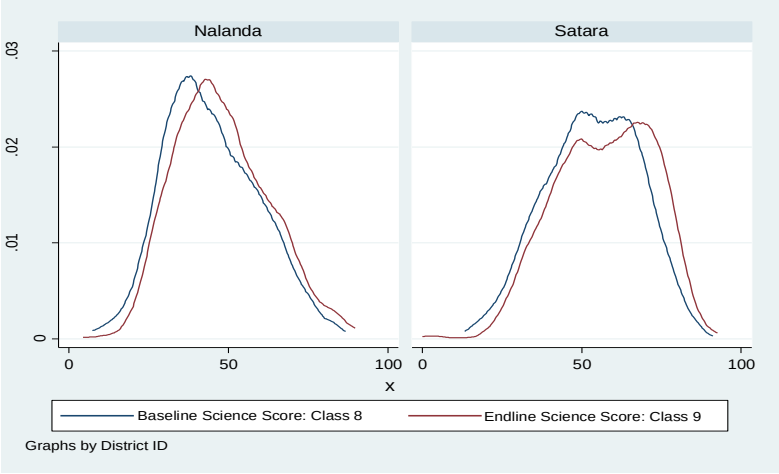



**Figure 4.10c: Science Scores: Kernel distribution plot (Baseline: Grade 8 and Endline: Grade 9)**



Two samples were administered in science.[15] The science assessment tested children on the following competencies: natural resources and phenomenon, plant/ animals and living world, food and water. The percentage share of the different competencies varies across the samples. With overall low scores for all classes, Table 4.10 illustrates that there are no competency categories in which sampled children did well in either Nalanda or Satara at both baseline and end line.

**Table 4.10: Competency-wise share in the mean scores in science**

| Science Mean Score (Sample 1) | Percentage share in max. marks | Nalanda | | Satara | |
|---|---|---|---|---|---|
| | | Baseline | Endline | Baseline | Endline |
| Natural Resources and Phenomenon | 29.41 | 11.78 | 13.58 | 15.09 | 16.89 |
| Plant/Animals and Living World | 35.29 | 14.96 | 16.96 | 16.23 | 18.25 |
| Food | 19.12 | 6.89 | 7.83 | 9.45 | 10.53 |
| Water | 16.18 | 6.12 | 6.72 | 6.85 | 7.69 |
| Total | 100.00 | 39.75 | 45.09 | 47.62 | 53.35 |

| Science Mean Score (Sample 2) | Percentage share in max. marks | Nalanda | | Satara | |
|---|---|---|---|---|---|
| | | Baseline | Endline | Baseline | Endline |
| Natural Resources and Phenomenon | 23.53 | 10.92 | 12.14 | 12.96 | 14.69 |
| Plant/Animals and Living World | 26.47 | 12.70 | 14.30 | 13.68 | 14.69 |
| Food | 26.47 | 10.90 | 12.54 | 13.93 | 15.25 |
| Water | 23.53 | 8.69 | 9.62 | 9.39 | 10.38 |
| Total | 100.00 | 43.20 | 48.59 | 49.96 | 54.99 |

[15] Sample 1 and Sample 2 administered in science had different performance tasks. Performance task presents situation that calls for learners to apply their learning in a context. Sample 1 had performance task pertaining to natural resources and plant/animal and sample 2 had performance tasks pertaining to food and water. The reason for putting in different performance task in 2 samples was to include all the important content domains prescribed in the curriculum for middle grades. In this case- food, plant/ animals, natural resources and water. The reason for different number of sub-questions within each performance task is attributed to the multiple assessable concepts within that topic. The sub-questions within these task also have variable cognitive complexities.

### *English*

The mean score in Nalanda across all the grades and in both the assessments is below 50 percent. In Satara, barring end line grade 8 and grade 9 mean score, the mean score remains below 50 percent. Though the mean score increases with the grade and between baseline and end line (with the difference being significant), it is still not an impressive score. More than half of the sampled children in Nalanda and Satara score below 50 percent or barely touch it, irrespective of grade and timing of assessment.

**Table 4.11: Summary distribution of English scores, by enrolled class and district**

| Particulars | Nalanda | | Satara | |
|---|---|---|---|---|
| | Baseline | End line | Baseline | End line |
| Baseline Grade 6, End line Grade 7 | | | | |
| N | 507 | 529 | 657 | 668 |
| Mean | 36.27 | 45.74*** | 37.08 | 45.37*** |
| Median | 33.90 | 45.76 | 33.90 | 44.07 |
| Baseline Grade 7, End line Grade 8 | | | | |
| N | 647 | 632 | 675 | 703 |
| Mean | 40.60 | 50.51*** | 43.72 | 50.61*** |
| Median | 37.29 | 50.85 | 42.37 | 49.15 |
| Baseline Grade 8, End line Grade 9 | | | | |
| N | 644 | 611 | 682 | 703 |
| Mean | 44.09 | 49.94*** | 45.78 | 52.81*** |
| Median | 42.37 | 49.15 | 44.07 | 52.54 |
| All grades | | | | |
| N | 1798 | 1772 | 2014 | 2074 |
| Mean | 40.63 | 48.89*** | 42.25 | 49.67*** |
| Median | 37.29 | 49.15 | 40.68 | 49.15 |

*** p < 0.01, ** p < 0.05, * p < 0.10; two- tailed test, mean score (End-line)> mean score (Baseline)

It can be seen from the Figure 4.11a-4.11c that the distribution of English scores in the baseline assessment in both districts, Nalanda and Satara, is positively skewed. The overall distribution of end line test scores in Nalanda is normal for grade 7, grade 8 and grade 9. In Satara, the distribution of end line score is slightly positively skewed for grade 7 and 8 and normal for grade 9. As with language, math and science, the kernel distribution of end-line English scores shifts rightwards as compared to the baseline distribution for all grades and in both the districts.

**Figure 4.11a: English scores: Kernel distribution plot (Baseline: Grade 6 and End-line Grade 7)**

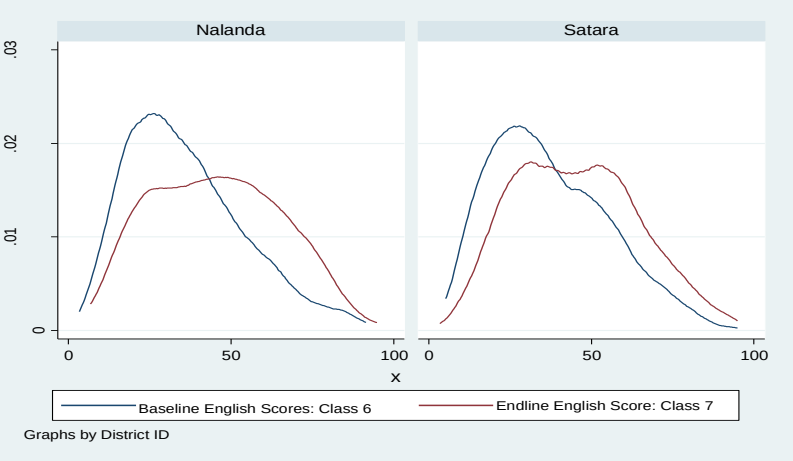



**Figure 4.11b: English scores: Kernel distribution plot (Baseline: Grade 7 and End-line Grade 8)**

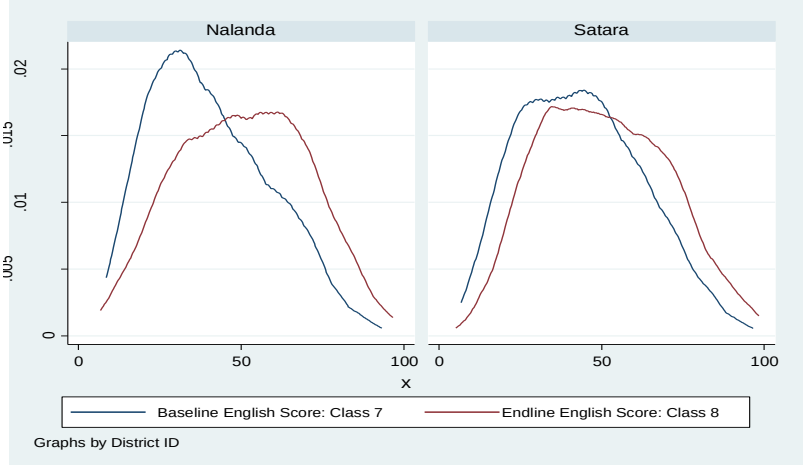
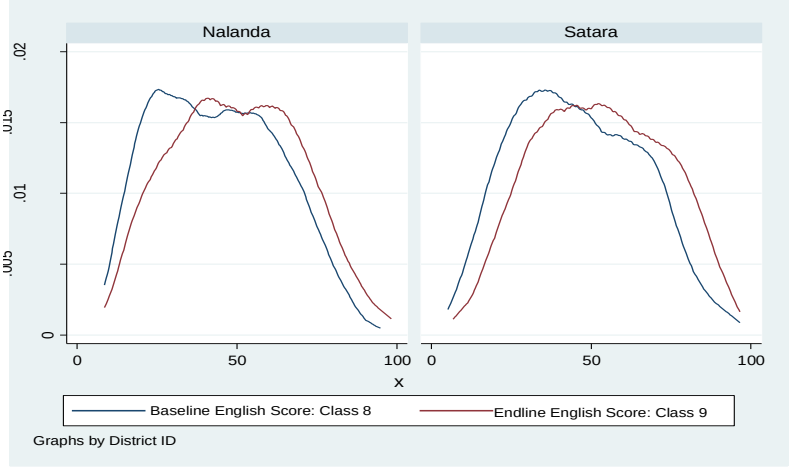


**Figure 4.11c: English scores: Kernel distribution plot (Baseline: Grade 8 and End-line Grade 9)**

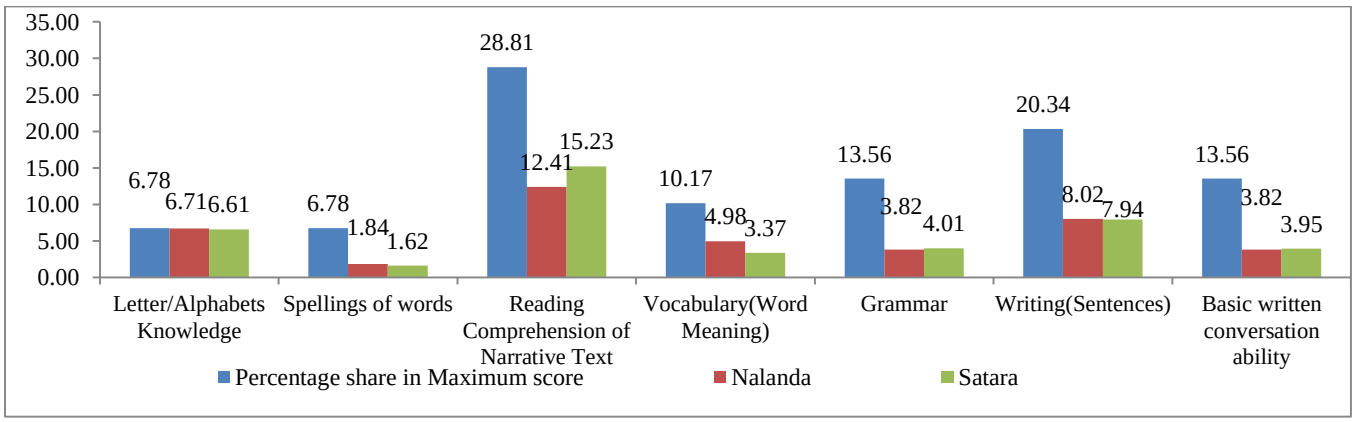



The English assessment included competencies related to knowledge of letter/ alphabets, spellings, reading comprehension of narrative text, vocabulary, grammar, writing sentences and basic written conversation ability. Sampled children in both the districts have done well in knowledge of letters/ alphabets scoring almost full points in that section (Figure 4.12). However, children have performed poorly in all the other competencies in both the districts and in both the baseline and end line assessments. That is, consistent with what we have observed for other subjects, there is no drastic improvement in average scores across competency categories between end line and baseline.

**Figure 4.12: Competency-wise share in the mean scores in English**

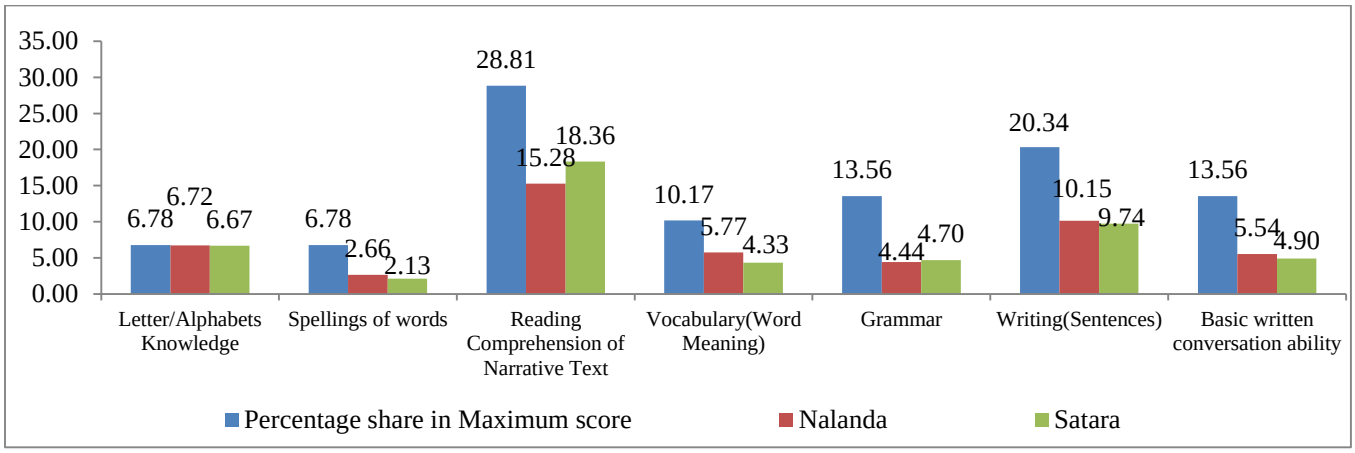
Baseline: English

Mean percentage baseline English score: Nalanda- 41.60 and Satara-42.74



End line: English

Mean percentage end line English score: Nalanda- 50.55 and Satara-50.82




## 4.7 Learning outcomes of children making grade-appropriate transitions versus non-grade appropriate transitions

Majority (92.41 percent) of the sampled children transitioned to the appropriate or expected grade i.e. children enrolled in grade 6, 7 and 8 in 2013 moved to grade 7, 8 and 9 respectively in 2014. However, a small proportion of children deviated from this expected pattern. A few children were found in a lower class; some stayed in the same grade; and others jumped a grade (N= 173). In this section, we compare the average scores of the children who transitioned to the appropriate grade with those who did not follow the expected grade transition pattern and test if there is any significant difference in their mean scores between baseline and end line assessment.

**Table 4.12: Mean percentage scores of children for grade transition categories, by subject**

| Average Percentage score | Grade appropriate students | Non-grade appropriate student |
|---|---|---|
| | Language | |
| Baseline | 47.17 (3873) | 43.39** (129) |
| Endline | 55.67 (3995) | 54.70 (112) |
| | Math | |
| Baseline | 41.84 (4297) | 42.58 (140) |
| Endline | 51.49 (4071) | 54.02 (121) |
| | Science | |
| Baseline | 45.51 (3874) | 42.93** (125) |
| Endline | 50.19 (3894) | 46.45*** (115) |
| | English | |
| Baseline | 41.48 (3812) | 41.48 (125) |
| Endline | 49.31 (3846) | 47.70 (110) |

*** p < 0.01, ** p < 0.05, * p < 0.10; one- tailed test

The table above represents the subject-wise average percentage scores of children who made grade appropriate transitions and those who did not make such transitions. We employ welch t-test[16] to check if there is significant difference between the scores of children who have transitioned to appropriate or expected grade and children who have transitioned to lower grade or remained in same grade or jumped to grade higher than the expected grade. The table indicates that barring science where there is a significant difference in scores at both baseline and end line, the difference in scores between grade appropriate and not- appropriate transitions is not significant. This possibly suggests that sampled children make non- appropriate grade transitions for reasons other than academic.

[16] Welch t-test is used in the case of unequal sample sizes. The test assumes that both groups of data are sampled from Gaussian populations, but does not assume those two populations have the same standard deviation.

## 4.8 Learning levels of drop-out children

Table 4.13 below gives the characteristics of drop out children in terms of gender, socio-economic background and learning levels. As indicated by the table, more children have dropped out in Nalanda than Satara. Girls are more likely to drop out as are children from households where the mother is not literate. On the other hand, there does not seem to be any particular trend by caste or affluence- that is, children from "lower" caste or poor households are not particularly likely to drop out. Children who dropped out were less likely to clear both the language and math qualifier test. But there does not appear to be a huge difference in average mean scores in pen and paper tests between drop out and children who continued with their schooling post the baseline survey.

**Table 4.13: Characteristics of drop out and currently enrolled children**

| | Drop out children | Currently enrolled children |
|---|---|---|
| District | | |
| Nalanda | 3.89 | 96.11 |
| Satara | 0.83 | 99.17 |
| Gender | | |
| Girls | 58.96 | 49.40 |
| Economic status | | |
| Bottom 25 percent | 17.29 | 19.40 |
| Caste | | |
| General caste | 15.04 | 29.62 |
| Scheduled caste | 13.53 | 11.96 |
| Other backward Caste | 29.32 | 22.96 |
| Extremely backward caste | 18.05 | 17.26 |
| Mother's education | | |
| Illiterate | 69.05 | 41.50 |
| Qualifier floor test at baseline | | |
| Qualified in both language and math test | 55.38 | 81.25 |
| Percent mean scores in pen and paper test at baseline | | |
| State vernacular | 41.62 | 47.05 |
| Math | 38.55 | 41.86 |
| Science | 44.12 | 45.43 |
| English | 39.55 | 41.48 |

## 4.9 Conclusions

To conclude, learning outcomes do not seem to have improved much between the baseline and end line. Indeed, it can be said that the sampled children are stuck in a "low learning trap", with close to 8 percent children transitioning to the next class without even foundational language and math proficiency. The end line pen and paper assessments similarly reveal that while average scores have increased (though even then it hovered at about 50 percent or thereabouts), break-up of the scores by competency categories indicate that children have not done particularly well in categories that they were weak in at base line assessments. Some children also made non- grade appropriate transitions- that is, they moved to lower or upper grades or remained in the same grades. But a comparison of their performance in pen and paper tests indicate that they did so for reasons other than academic. Subject wise comparisons of results children in Nalanda have done the best in math, followed state vernacular, English and science while children in Satara have done the best in state vernacular, followed by science, English and math.

# V. A Look at the Supply Side: School Infrastructure, Classroom Processes and Teachers

## 5.1 Overview

As part of the study, we visited the schools of the sampled children to observe classroom practices, school infrastructure, and teachers. Since the study employed a village sample (first stage) and then a sample of target population children in the sampled villages, we had to link children to schools, generate a list of all possible schools that the sampled children attended and then sample schools from that list. There were two challenges in this process:

1. Unlike primary grades, where most children go to the school in the village, middle school students often go to schools located outside the village. One reason for this is access – according to ASER 2014, while 96.1 percent villages had a primary school located in it, only 55.1 percent had a middle school. The other reason could be a shift to private school in higher grades, which are often located outside the village.

   The sampling strategy that we followed allows us to address both these issues: first, schools visited by sampled children in Visit 1 in each of the 60 surveyed villages in both the districts were listed. Second, one school, with maximum number of sampled children enrolled, in every surveyed village of the study districts was identified. Thus, we had a total of 60 schools in each study district with maximum number of sampled children enrolled for the purpose of undertaking school survey. Irrespective of the location or the management type of the school, this sampling strategy allows us to link maximum number of children to our school survey.

2. Even though we were able to record the name of the school the children attended in Visit 1, by the time the school visit came about children had transitioned to the next class. This created a problem for children in Std. 8 in Nalanda who had shifted to different secondary school in Std. 9. For Maharashtra, this transition happens in Std. 7. For logistical purposes, it was decided to visit the school the children were enrolled in Visit 1.

Of the 60 selected schools in Nalanda and Satara, 59 schools in Nalanda and 54 schools in Satara were surveyed.[17] The school survey was conducted between March and June 2015 in

[17] Of the 60 randomly sampled schools in Nalanda, one school served as a police camp for a fair which was going on in Nalanda and hence remained shut throughout the survey period.

Bihar and Maharashtra. The survey was slightly delayed in Bihar because of an ongoing strike of para- teachers. A team of two surveyors collected information on school related indicators. The school survey consisted of three formats which focused on:

A. School Infrastructure

B. Classroom Organization, Activities and Processes[18]

C. Teachers' background, classroom activities and attitudes

These three formats capture what schools and classrooms look like and what happens inside the classrooms.

The chapter is organized as follows: the first part focuses on school infrastructure, the second part on classroom organization and the final part on teachers- their background, classroom activities and attitudes.

## 5.2 Background information

The school observation format was designed to capture availability, arrangement and utility of infrastructure. Some information like type of road leading to the school, availability of facilities in the school and its infrastructure, organization of classrooms, student attendance, teacher attendance etc. was collected based on observation by the surveyor; and some other information was collected based on responses by the HM/senior teacher and/or by looking at registers.

### *Schooling structure*

Integrated upper primary and secondary schools enable smooth transition of children from VIII grade (final upper primary grade) to IX grade (lowest secondary grade) increasing their retention at secondary level. In Nalanda, only 3.4 percent of schools have integrated primary, upper primary and secondary. Around 95 percent of schools have an integrated primary and upper primary, but not beyond upper primary grades. Upgrading upper primary schools to secondary level is necessary for reducing the drop-out rates amongst children post VIII grade. In

[18] In Maharashtra, classroom observations could not be carried out in all the schools because in some schools final examinations were being held.

Satara, on the other hand, 61 percent of schools have integrated upper primary and secondary sections and about 18 per cent of schools have grades from primary to higher secondary in same school.

Government schools are predominant in Nalanda- 98 percent of schools surveyed are government schools. On the other hand, 80 percent of schools in Satara are government aided schools and 17.5 percent are private unaided schools.

**Table 5.1: School level, by district**

| School Level | Nalanda | Satara |
|---|---|---|
| Primary + Upper Primary | 94.8 | 0 |
| Only Upper Primary | 1.7 | 0 |
| Only Secondary | 0 | 16.67 |
| Upper Primary + Secondary | 0 | 61.11 |
| Primary + Upper Primary + Secondary | 3.4 | 0 |
| Primary + Upper Primary + Secondary + Higher Secondary | 0 | 1.85 |
| Secondary + Higher Secondary | 0 | 1.85 |
| Upper Primary + Secondary + Higher Secondary | 0 | 18.52 |
| Total | 58[19] | 54 |

### *Accessibility of schools*

To understand whether schools are accessible to children, surveyors were asked to observe the type of road leading to school. Except for one school in Nalanda, other schools are accessible by some type of road. Most of the schools in Nalanda (71 percent) and Satara (94.4 percent) have tar/concrete road leading to school.

[19] One missing observation.

**Table 5.2: Type of road leading to school, by district**

| Type of road leading to school | Nalanda | Satara |
|---|---|---|
| Tar/ Concrete | 71.19 | 94.44 |
| Brick sealing | 10.17 | 0 |
| Mud | 16.95 | 5.56 |
| No road | 1.69 | 0 |
| Total | 100 | 100 |

### *Enrolment, attendance and headcount*

Information pertaining to enrolment, attendance and headcount was noted in the surveyed schools. Since the focus of the survey was middle school, we noted total enrolment of children in grades VI, VII and VIII in each surveyed school. In addition to this, total attendance on the day of survey and a day before the survey was recorded for these three grades from the attendance register. Surveyors were also asked to record attendance in these grades by taking a headcount of children present on the day of survey.[20] This allows us to see whether children who have enrolled are attending school and whether there is a discrepancy between recorded and observed attendance.

Table 5.3 indicates attendance is higher in Satara as compared to Nalanda – this is true across all grades. Average attendance as a percent of average enrolment on the survey day is 68 percent in grade 6. Percent of average headcount to average enrolment dips lower to only 60 per cent of children. Similar are the figures for VII and VIII. Satara has a better record attendance wise. On the day of survey, on an average 92 percent of enrolled children in grade 6 were present and 88 percent were present as per the headcount done by the surveyor.

In all cases observed attendance is systematically lower than that recorded in registers. This is important and similar observations have been made by other studies as well (for example Inside Primary School, SchoolTells). This systematic downward bias could reflect two things:

[20] The school survey did not focus on the sampled child for logistical reasons. Instead the focus was to gather information on upper primary grades.

First, that children don't attend school for the entire day[21], and/or schools inflate attendance numbers in order to get higher entitlements that are based on attendance, like mid-day meal.

**Table 5.3: Enrolment and attendance, by district**

| Enrolment | Nalanda | | Satara | |
|---|---|---|---|---|
| | Avg. enrolment | Attendance as % of enrolment | Avg. enrolment | Attendance as % of enrolment |
| Total average enrolment per school | 513 | | 417 | |
| | Class 6 | | | |
| Average enrolment per school: Std 6 | 94 | | 63 | |
| Average attendance as % of average enrolment on the survey day (from attendance register) | 64 | 68.09 | 58 | 92.06 |
| Average attendance as % of average enrolment on the survey day (from head count) | 57 | 60.64 | 56 | 88.89 |
| | Class 7 | | | |
| Average enrolment per school: Std 7 | 94 | | 63 | |
| Average attendance as % of average enrolment on the survey day (from attendance register) | 64 | 68.09 | 57 | 90.48 |
| Average attendance as % of average enrolment on the survey day (from head count) | 58 | 61.70 | 54 | 85.71 |
| | Class 8 | | | |
| Average enrolment per school: Std 8 | 84 | | 78 | |
| Average attendance as % of average enrolment on the survey day (from attendance register) | 56 | 66.67 | 69 | 88.46 |
| Average attendance as % of average enrolment on the survey day (from head count) | 50 | 59.52 | 65 | 83.33 |

[21] Typically, attendance registers are filled in the morning while school observation happened later in the day. But there are some instances where the investigators were in the school in the morning when attendance was being taken. The fact that school observation happened in the morning for some schools, yet observed attendance has an overall downward bias. This can only mean that the situation as it pertains to attendance in our middle schools is rather appalling.

### 5.3 School Infrastructure

The surveyors collected information on availability of facilities and infrastructure in the school based on direct observation.[22] Table 5.4 below presents findings as they relate to the provision of infrastructure.

The overall picture in terms of provision of infrastructure facilities is not a promising one. Schools in both districts seem to lack basic facilities. Not all schools have a hand pump with potable water. Fewer still have toilet facilities for students and teachers. Provision of separate toilet facilities for girls and boys, which assumes a greater significance for middle schools, is not 100% and the percentages drop further for toilets that are unlocked and usable. While almost all schools have an office or a store or a room that functions as office cum store, quite a considerable percentage of schools lack a playground and a complete boundary wall.

A usable library, computer and science laboratory, which ought to form a key ingredient of middle school education are also conspicuous by their absence, particularly in Nalanda. Only 2 percent and 10 percent of surveyed schools in Nalanda have computers and science laboratory respectively; in still fewer schools, children were observed using them. In Satara, 94 percent of the schools had a computer/science laboratory and in the case of the computers, in 34 percent of the school children were observed using a computer. While it is true that in Satara too the usage of computers and science labs are lower as compared to its provision, the latter is likely to be influenced by the fact that final examinations were underway at the time of the survey.

[22] Provision of most of these facilities is mandated by the RTE. However, provision by itself is meaningless if the facility is unavailable for use or is not maintained properly and cannot be used. Therefore, surveyors were asked to observe whether a facility was available and if so whether it could be used.

**Table 5.4: Percentage of schools with infrastructure facilities**

| Schools with following infrastructure facilities | Nalanda | Satara |
|---|---|---|
| **Basic physical infrastructure** | | |
| Complete boundary wall | 55.9 | 59.6 |
| Office/ Store/Office cum store | 91.5 | 90.4 |
| Playground | 84.7 | 96.2 |
| Hand pump | 91.5 | 94.2 |
| Schools with hand pump and potable water? | 83.1 | 86.5 |
| Other water source available if hand pump not available* | 80 | 100 |
| Toilet for boys | 78 | 98.1 |
| Unlocked boys' toilets | 59.3 | 61.5 |
| Unlocked boys' toilets that are usable | 42.4 | 55.8 |
| Toilet for girls | 64.4 | 94.2 |
| Unlocked girls' toilets | 54.2 | 63.5 |
| Unlocked girls' toilets that are usable | 35.6 | 55.8 |
| Common Toilet | 31 | 14.3 |
| Unlocked common toilets | 17.2 | 6.1 |
| Unlocked common toilets that are usable | 8.6 | 4.1 |
| Toilet for teachers | 32.2 | 50 |
| Unlocked teachers' toilets | 15.3 | 30 |
| Unlocked teachers' toilets that are usable | 13.6 | 30 |
| **Other infrastructure facilities** | | |
| Mid- day meal menu displayed in the school | 59.3 | 84.6 |
| Schools having library and children seen reading library books | 12.3 | 15.7 |
| Computers for use by children | 1.7 | 94 |
| Schools having computer lab and children seen in computer lab | 0 | 34 |
| Science Lab | 10.2 | 94.2 |
| Schools having lab and children seen in lab | 5.1 | 13.5 |

* Percentage out of total schools that do not have any hand pumps. Total number of schools where hand pump is not available in Nalanda is 5 & total number of schools where hand pump is not available in Satara is 3.

## 5.4 Classroom observation

The objective of classroom observation was to observe teaching and learning activity in the classroom. Surveyors were instructed to observe a Std. VIII language class in the visited schools. If a language class was not scheduled or if it was not possible to observe it, then a Std. VIII math class was to be observed. The surveyors were instructed to sit on the floor at the back of the class. If more than one class was sitting together, surveyors were instructed to observe only Std. VIII children. If it was not easy to identify only VIII grade children, then the entire class was observed. Answers to all questions on the classroom observation sheet required direct observation by the surveyor. The surveyors had to observe a classroom for 30 minutes and fill in the class observation format immediately after that. In all, 57 classrooms and 51 classrooms in Nalanda and Satara, respectively, were observed.

### *Seating arrangement*

To begin with, surveyors were asked to observe whether children are seated in classroom or veranda or outdoor. In both districts in about 98 percent of classrooms observed, children are seated in classroom.

**Table 5.5: Multi-grade classrooms in surveyed schools**

| Particulars | Nalanda | Satara |
|---|---|---|
| Single grade in class | 75.44 | 98.04 |
| Two grades in class | 17.54 | 1.96 |
| Three or more grades in class | 7.02 | 0 |
| Total | 57 | 51 |

But multi-grade teaching practice is common due to acute shortage of teachers and space, particularly in Nalanda as also indicated in the household survey at baseline. About 25 percent of classrooms in Nalanda have more than one grade sitting together. Multi-grade seating arrangement was not observed in Satara except in one school.

**Table 5.6: Sitting arrangement in classroom, by district**

| Particulars | Nalanda | Satara |
|---|---|---|
| There is enough space for children to sit | 80.7 | 100 |
| There is space for teacher to walk up to every child | 73.7 | 100 |
| Children are sitting on chairs | 78.9 | 90.2 |
| Children are sitting on *tat-pattis* | 14.0 | 0 |
| Total | 57 | 51 |

Surveyors were instructed to observe if there was enough space for children to sit comfortably in the classroom and for teacher to walk up to every child. Again Satara seems to be better placed than Nalanda. In Satara, all the classrooms surveyed were comfortable and spacious for children to sit and for the teacher to be able to reach every child. In Nalanda about a fourth of the classrooms did not have enough space for children to sit and for teachers to walk easily to every child.

### *Teaching learning aids and display environment*

Surveyors observed the availability of teaching learning aids (other than textbooks) and display environment in terms of putting up children's creative work and time table. In both districts, approximately 98 percent of classrooms had a blackboard which was easy to write on and that a child sitting at the back of the classroom could easily see it.

What the classrooms in both the districts lacked, though Nalanda appears to be particularly ill-equipped, is presence of TLM and children's creative work displayed on walls. Not all classrooms displayed their timetables either. The percentage of classrooms with a timetable is greater in Satara than Nalanda. In Satara, 72 percent of schools had the time table displayed in the classroom whereas 50 percent of schools in Nalanda had the time table displayed in headmaster's room. In about three fifth classrooms in Nalanda, teachers taught same subject as mentioned in the timetable whereas in approximately four fifth of the classrooms in Satara the subject being taught matched with what was on the timetable.

**Table 5.7: Teaching learning aids and display environment, by district**

| Particulars | Nalanda | Satara |
|---|---|---|
| There is a blackboard that is easy to write on | 98.2 | 98 |
| The child in the back can easily see the writing on the blackboard | 94.7 | 98 |
| Chalk is available in the class for writing on blackboard | 91.2 | 98 |
| TLM is available in the class (other than textbooks) | 7.0 | 66.7 |
| Children's creative work is displayed on walls | 33.9 | 60.8 |
| Time table displayed on the wall or on the board | 7 | 3.92 |
| Time table inside a classroom | 5.26 | 72.55 |
| Time table in head master's room | 50.8 | 43.14 |
| Total | 57 | 51 |

### *Classroom and teacher activity*

Teachers were inclined to follow a didactic (and not a participative) approach towards teaching. One- way interaction was evident in most classrooms surveyed, where a teacher dominates and students are passive. In more than three- fourth of the classrooms surveyed in Nalanda and Satara, teachers were seen reading aloud from the textbook or writing on the blackboard from the textbook or asking questions related to material in the textbook orally. In less than half of the classrooms surveyed, teachers performed activities that involved interaction with children or making children participate in classroom activity. These activities include asking children to read one by one, asking children to write on the blackboard and making children write something. But even here heavy focus is on reading, writing or dictating from textbooks. In a meagre 1.8 percent classrooms in Nalanda and 10 percent classrooms in Satara, teachers were observed asking children to use TLM other than textbooks. In only 1.8 percent and 15.8 percent classrooms in Nalanda, teachers were observed making children work in small groups and asking children to perform activities not based on textbook respectively. Similarly, in very few classrooms in Satara, teachers made children work in small groups (6 percent) and asked children to perform non-textbook activities (4 percent).

The lack of a participative teaching-learning environment is also reflected in the fact that in most of the classrooms, in both the districts, the teachers neither knew names of the children nor were they making the class interesting by smiling or cracking a joke in their interaction with

students. In about half of the classrooms in Satara and around 30 percent in Nalanda, the teacher did not approach students sitting in the middle or back of the classroom (Table 5.10). This non-interactive approach is also reflected in students' activity in the classroom. Along with what the teacher was doing, surveyors were also asked to record all the activities that students were engaged in class (Table 5.9). The checklist included reading from the textbook/other book, copying from the black board, taking dictation, etc., for classrooms where language was being taught. In classrooms where math was being taught, checklist included copying numbers, sums from blackboard, reciting multiplication tables/ numbers, etc. In a majority of classrooms in both the districts (more than 50 percent in Nalanda and more than 40 percent in Satara), students were seen copying from textbook/ blackboard and reading from textbook.

On a slightly more positive note, there are very few cases (7 percent in Nalanda and 4 percent in Satara) of teacher carrying a cane or stick to the classroom or giving corporal punishment (Table 5.10). Furthermore, in more than half of the classrooms in both the districts, teachers made use of local information to engage the class and make it relevant. Surveyors were also asked to observe if teachers were involved in some non-teaching activity and whether they left the classroom before the class was over. No teacher in Satara was observed engaging in any kind of non-teaching work and only 6 percent teachers left the room before the class was over. In Nalanda, the corresponding percentages were 7 percent and 17.5 percent, respectively.

**Table 5.8: Teaching activity, by district**

| Particulars | Nalanda | Satara |
|---|---|---|
| Reading aloud from Textbook | 73.7 | 84 |
| Writing on blackboard | 71.9 | 92 |
| Dictation | 21.1 | 28 |
| Asking children to read one by one | 52.6 | 14 |
| Asking children to write on blackboard | 24.6 | 14 |
| Asking questions related to text book to students (orally) | 75.4 | 76 |
| Making children write something | 43.9 | 46 |
| Assessing children's work | 29.8 | 10 |
| Asking children to use TLM other than textbooks | 1.8 | 10 |
| Making children sit in groups and work | 1.8 | 6 |
| Asking children to perform activities not based on textbook | 15.8 | 4 |
| Total | 57 | 50 |

**Table 5.9: Students' activity, by district**

| Particulars | Nalanda | Satara |
|---|---|---|
| Reading from a textbook | 66.7 | 42 |
| Reading from other book | 14 | 4 |
| Copying from blackboard or textbook | 59.6 | 44 |
| Taking dictation | 22.8 | 28 |
| Other writing activity | 24.6 | 2 |
| Copying numbers or sums from blackboard or textbook** | 83.3 | 57.1 |
| Reciting numbers or multiplication tables** | 50 | 14.3 |
| Other math activity** | 33.3 | 57.1 |
| Other non- book activity | 26.3 | 6.1 |

Note: ** indicates that the denominator is the total number of classrooms where math was being taught (which is 6 in Nalanda and 7 in Satara).

**Table 5.10: Teachers' activities, by district**

| Particulars | Nalanda | Satara |
|---|---|---|
| Approach at least 3 students in middle or back of class | 70.2 | 52 |
| Call at least 3 children by their name while teaching | 54.4 | 68 |
| Smiling, laughing, joking with students | 33.3 | 66 |
| Giving corporal punishment | 5.3 | 2 |
| Carrying a cane or stick in the classroom | 7 | 4 |
| Using negative language with children | 8.8 | 4 |
| Use local info. to make the class relevant | 59.6 | 70 |
| Engaged in any kind of non teaching work | 7 | 0 |
| Leave classroom before class was over | 17.5 | 6 |
| Total | 57 | 50 |

## 5.5 Teachers' background, activities in school and attitudes

Teachers teaching upper primary grades were also administered a questionnaire as part of the school survey. This was a self- administered questionnaire that teachers had to fill out themselves. Upper primary teachers in a school were identified when surveyors reached a school and questionnaire was handed to all of them. They had the time till the surveyors filled out the questionnaires. Teachers filled the format in their classrooms/ staffroom and handed it over to

the surveyor. The surveyors were instructed not to administer the questionnaire either by verbally asking the questions to them or by marking down answers on their behalf. The teacher's questionnaire was designed to understand who teachers are, their teaching experience and practices and their perception and attitude towards children's learning and classroom practices.

### *General Information*

Of the teachers present on the day of survey in 59 schools in Nalanda, 274 upper primary teachers filled out the questionnaire and of the teachers present on the day of the survey in 54 schools in Satara, teacher's questionnaire was filled out by 425 upper primary teachers.[23]

**Table 5.11: Teacher type, by district**

| Teacher Type | Nalanda | | | Satara | | |
|---|---|---|---|---|---|---|
| | Male | Female | Total | Male | Female | Total |
| Head Master | 6.8 | 3.6 | 5.8 | 10.3 | 3.8 | 8.3 |
| Regular Teacher | 42.4 | 31.3 | 39.1 | 83.8 | 91 | 86.1 |
| Para-Teachers | 50.8 | 65.1 | 55.1 | 5.5 | 5.3 | 5.4 |
| CRC | 0 | 0 | 0 | 0.3 | 0 | 0.2 |
| Total | 191 | 83 | 274 | 291 | 133 | 424 |

Two fifth of the total teachers surveyed in Nalanda at upper primary level were regular teachers and about 55 per cent teachers were '*Prakhand Shikshak'* (para-teachers).[24] *Prakhand Shikshak* or block teachers are the contractual teachers appointed at the block level for I to VIII grade. On the other hand, of the total teachers surveyed in Satara, about 86 per cent were regular teachers with a meagre 5.4 per cent of the teachers surveyed being *'Shikshan Sevak'*. '*Shikshan Sevak'* are para-teachers appointed on contract. From the distribution of teachers, it is clear that majority of teachers in Nalanda are on contract, whereas in Satara, majority of the teachers are regular. The reliance on contractual teaching as opposed to regular teachers probably adds to the teaching woes of the education system in Bihar.

[23] It is difficult to get a sense of the number of teachers to whom the questionnaires were handed out, but did not fill it up.
[24] *Prakhand* is a block which is a unit in sub-district level administration structure of a district.

About 70 percent of teachers surveyed in Nalanda are men and remaining 30 percent are women. Female representation in upper primary schools in Satara is same as Nalanda. Given what we have already observed in Table 5.11, majority (91 percent) of female teachers in Satara are regular teachers and most (65 percent) of female teachers in Nalanda are on contract (para-teachers).

Younger teachers are more likely to be para- teachers than regular teachers. Regularisation of teachers in Satara is also reflected in that more than three fourth of the teachers surveyed in each of the age categories are regular teachers (Refer Appendix Table A.5.1). Caste wise, approximately half of the teachers surveyed in Nalanda belong to Other Backward Class (OBC) category followed by Extremely Backward Class (22 percent). On the other hand, in Satara, 44 percent of teachers surveyed belong to general category followed by teachers belonging to Other Backward Class. The caste distribution of teachers likely mirrors the distribution of caste in the respective states.

### *General and professional qualifications of teachers*

In Nalanda, slightly less than half of the surveyed teachers (44.5 percent) have completed graduation. Percentage share of teachers who have completed post-graduation is 26 percent. A little more than one fifth of total teachers surveyed have only completed higher secondary (Class 12). Percentage of teachers who have completed graduation and post-graduation is relatively higher in Satara- 58 percent of teachers are graduate and 33.6 percent are post- graduates. In addition, nearly three fourth of teachers in Satara have additional professional qualification like B.Ed (Bachelors in Education) and about 17.5 percent teachers possess diploma in education.

**Table 5.12: General qualification of teachers, by district**

| General Qualification | Nalanda | | Satara | |
|---|---|---|---|---|
| | No. | % | No. | % |
| Below Std 10th | 0 | 0 | 3 | 0.7 |
| Std 10 | 11 | 4 | 10 | 2.4 |
| Std 12th | 66 | 24.1 | 21 | 4.9 |
| Graduate | 122 | 44.5 | 248 | 58.4 |
| Post Graduate | 73 | 26.6 | 143 | 33.6 |
| Ph.D | 2 | 0.7 | 0 | 0 |
| Total | 274 | 100 | 425 | 100 |

**Table 5.13: Professional qualification of teachers, by district**

| Professional Qualification | Nalanda | | Satara | |
|---|---|---|---|---|
| | No. | % | No. | % |
| Diploma(D.Ed, TTC,C.P.Ed) | 56 | 20.5 | 74 | 17.5 |
| B.Ed(graduate) | 54 | 19.8 | 315 | 74.3 |
| M.Ed(postgraduate) | 3 | 1.1 | 14 | 3.3 |
| Other | 71 | 26 | 15 | 3.5 |
| No professional Qualification | 89 | 32.6 | 6 | 1.4 |
| Total | 273 | 100 | 424 | 100 |

While head/ regular teachers have teaching experience of many years, majority of *Prakhand Shikshak /Shikshan Sevak* have less than five years of teaching experience from the time of first appointment as teacher. On the other hand, more than half of the head/regular teachers have spent less than five years in current school from the time of appointment in current school. Overall, in Nalanda vis-à-vis Satara there is a greater dependence on contractual teachers who also have lower levels of teaching experience.

Relatively larger proportion of head and regular teachers are subject to transfers than block teachers. Due to virtue of being local and more recently appointed, only 12 percent and 30 percent of para-teachers in Nalanda and Satara respectively are subject to transfer.

In-service trainings are intended to provide teachers with inputs and materials for improving subject knowledge and skills for delivery. These trainings range from a one- day

meeting to explain filling up of formats to longer duration capacity building exercises. In 2013-14 and 2014-15, approximately four- fifth of teachers did not attend any training programmes in Nalanda. In Satara, nearly half of the teachers surveyed did not attend training in both the years. However, it is not clear if teachers refused to attend trainings or no training was offered during this period. Of the teachers who attended training in these two years in Nalanda, 97 percent teachers reported to have learnt about teaching methodology. This includes learning about instructional strategies, disciplinary strategies, time management strategies etc. More than three-fifth of teachers who attended in- service trainings reported that they learnt to do administrative work better, gained some subject knowledge (content knowledge) and learnt about policy related to India/ Bihar.[25] Similarly, teachers who attended the training in Satara, 97 percent teachers reported learning about teaching methodology. Moreover, more than four fifth of teachers surveyed reported to have learnt to do administrative work better and have learnt about policy related to India/Maharashtra.[26]

### *Commute to school*

The distance between school and home can be a factor resulting in frequent absenteeism among teachers. Approximately 70 percent of teachers in Nalanda do not stay in the same village or town in which the sampled school is located. Most teachers spend more than half an hour in commuting to school and about 37 percent of teachers reported facing problems while commuting to the school. The proportion of teachers not staying in same village or town as sampled school is lower in Satara (50 percent) and fewer teachers were spending more than half an hour in commuting to school (20 percent); still lower percentage reported facing any kind of trouble in travelling to school.

[25] "Content knowledge" includes improvement in teachers' knowledge of subjects and cognition on how to teach them effectively to different age groups in school. "Policy awareness" includes improvement in teachers' awareness and understanding of different policies that have been instated pertaining to educational rights, the provision of schooling, and the welfare of children.
[26] Refer: Appendix Table A.5.2.

### *Working in school: Teaching practices*

In addition to observing classroom practices, teachers were asked about the time they spend on various activities related to their teaching, problems faced while teaching and remedial steps taken. There was also a section to gauge their attitudes towards students and what they believe are good teaching practices, both in terms of classroom activities as well as pedagogy. One danger of eliciting self-reported responses to practices, is that the respondents may report "what they think is the right practice" rather than "what they actually practice". The usual way to deal with this problem is to frame questions/statements in a way that do not "lead" the respondent. In addition, multiple questions around the same issue are asked to check for consistency of responses. In our case, it was possible to incorporate an additional check, viz., classroom observation of a subset of teachers. For instance, surveyors were asked to observe whether the teacher was calling students by their names and teachers were asked whether they knew the names of their students.

Before discussing teaching practices, it is worthwhile to get a sense of their teaching duties and load of their teaching and non- teaching duties. Teachers were asked to report the subjects they taught a day before the survey day. In Nalanda, three fifth of teachers surveyed reported teaching Hindi a day prior to the survey, followed by math (52 percent), science (49.27 percent) and English (43.07 percent). In Satara 42 percent teachers reported having taught 'other subjects' like physical training, general knowledge, drawing, value education, environment, Sanskrit etc. a day before the survey. A little less than two fifth of teachers reported teaching math, science and history a day prior to survey. The distribution for Satara is likely to have been influenced by the fact that final examinations were underway in the district at time of the survey. Approximately 60 percent of teachers in Nalanda have reported teaching three or more subjects a day prior to the survey. The corresponding percentage for Satara is 46. Teachers also teach combination of subjects that have otherwise little in common with each other- for instance, sizeable number of teachers have reported teaching Math/ Science and languages or Math/Science and Social science.

Teachers were asked to report the subject that they find "most difficult" to teach from the subjects they teach regularly, over one fifth of teachers in Nalanda and 14 percent in Satara said they did not find any subject difficult to teach.[27] But about 23 percent teachers have reported English and mathematics to be most difficult subject to teach in Nalanda. In Satara, 18 percent teachers reported mathematics to be the hardest subject to teach at upper primary level. This is followed by 'other subject' and English in Satara. The difficulty in grasping math and English is reflected in poor scores of children too in Satara- children have scored lower in math and English than in other subjects at both baseline and the end line. On the other hand, in Nalanda students have scored comparatively better in Math than other subjects. Is it the case that private tuition allows children to better grasp math in Nalanda? We have already noted at baseline the greater incidence of private tuition in Nalanda. Teachers in both the districts reported taking help from other teachers and BRC/CRC officials to resolve their problems.

**Table 5.14: Percentage distribution of teachers' response to questions on subjects found difficult in teaching and help sought, by district**

| Particulars | Nalanda | Satara |
|---|---|---|
| Of subjects taught regularly, which is the hardest? | | |
| None | 22.6 | 14.4 |
| English | 23.4 | 13.7 |
| Hindi | 4.7 | 2.5 |
| Marathi | 0.4 | 2.8 |
| Mathematics | 22.6 | 18.7 |
| Science | 7.3 | 10.6 |
| History | 5.5 | 8.8 |
| Geography | 5.5 | 6.3 |
| Civics/ Econ | 2.2 | 4.9 |
| Others | 5.8 | 17.3 |
| Total | 274 | 284 |
| From whom do you take help in case of difficulty? | | |
| Help from other teachers? | 48.5 | 81.7 |
| Help from BRC/CRC officials? | 31.8 | 30.4 |
| No difficulty | 20.8 | 4.1 |
| Nobody helps me | 2.6 | 1.2 |
| Help from others | 9.8 | 16.1 |

[27] Refer: Appendix Table A.5.3, Table A.5.4 and Table A.5.5.

Teachers were asked about their engagement in different activities as it pertained to their teaching- making a lesson plan, talking to a parent about their child's learning, using TLM other than textbook in a class, taking a book from the library, giving students homework, etc (Table 5.16). For each of these activities, they were asked to report the last time they did it. Table 5.16 gives the distribution of these activities by the frequency with which they were done. If a teacher reported doing an activity on the same day as the day of the survey or in the week prior to the survey, it is categorised as an activity done 'quite often'; if it is reported as an activity done in the last month or last three months preceding the survey, it is clubbed under 'sometimes' while those activities done three months ago or never are categorized as activities 'rarely or never' done.

Some of the observations pertaining to teaching methods noted in the preceding section are reinforced here. Teaching method tends to be didactic as is reflected in that more than 90 percent of teachers in both districts reported using a blackboard in class "often". The percentage of teachers reporting giving students homework too exceeds 95 percent in Nalanda. In comparison, fewer teachers reported making children work in small groups or using TLM other than textbooks in class. Multi- grade teaching too is common, particularly in Nalanda. Around half of surveyed teachers in Nalanda reported doing multi- grade teaching "often"; the corresponding percentage for Satara is about a quarter. The table also highlights that interaction with parents to discuss child's learning is not universal either- about 66 percent of teachers in both districts self- reported talking to parents about their children's learning. Administrative tasks- including serving mid- day meals- also account for a substantial part of their working week.

Table 5.15 which reports activities for broad categories as teaching, administrative work, etc. undertaken by the teacher in the week preceding the survey too confirm these trends. The table 5.16 also highlights that teachers have self- reported themselves to be rarely absent from work for half a day or more.

**Table 5.15: Percentage distribution on time spent on teaching related activities, by district**

| Particulars | Quite often | Sometimes | Rarely or Never |
|---|---|---|---|
| | Nalanda | | |
| Time spent on teaching | 96 | 3.3 | 0.7 |
| Time spent on preparing lesson | 86.1 | 12.4 | 1.5 |
| Time spent on filling register | 71.9 | 19.7 | 8.4 |
| Time spent on CCE/assessment activities | 50 | 43.1 | 6.9 |
| Time spent on preparing/serving MDM | 63 | 12.1 | 24.9 |
| Time spent on extra-curricular activities | 55.1 | 38 | 6.9 |
| Time spent on administrative work | 47.1 | 23.5 | 29.4 |
| | Satara | | |
| Time spent on teaching | 98.6 | 1.4 | 0 |
| Time spent on preparing lesson | 92.8 | 6.9 | 0.2 |
| Time spent on filling register | 64.1 | 23.5 | 12.4 |
| Time spent on CCE/assessment activities | 65.2 | 31.9 | 2.9 |
| Time spent on preparing/serving MDM | 52.6 | 29.6 | 17.8 |
| Time spent on extra-curricular activities | 38.3 | 57.4 | 4.3 |
| Time spent on administrative work | 33.8 | 48.3 | 17.9 |

**Table 5.16: Percentage distribution of time spent on various activities in the last working week, by district**

| Particulars | Quite often | Sometimes | Rarely or never |
|---|---|---|---|
| | Nalanda | | |
| Made a lesson plan | 91.9 | 6.6 | 1.5 |
| Talked to parents about child's learning | 65.7 | 26.3 | 8 |
| Used any TLM other than textbooks during class | 82 | 10.7 | 7.4 |
| Took a book from library | 69.3 | 12.9 | 18 |
| Gave students homework | 97.4 | 1.8 | 0.7 |
| Used blackboard during class | 95.6 | 3.3 | 1.1 |
| Made children work in small groups | 83.6 | 8.8 | 7.7 |
| Were absent from school for half a day or more | 11 | 10 | 78.9 |
| Taught a group of two or three grades together | 49.3 | 22.5 | 28.3 |
| Helped to prepare or serve mid- day meal | 72.1 | 12.1 | 15.7 |
| Spent more than one hour in filling register | 59.5 | 18.6 | 21.9 |
| Visited cluster or block resource centre | 42.7 | 41.2 | 16.1 |
| Asked somebody for help for teaching a topic | 44.5 | 16.6 | 39 |
| Played a game/sport with children | 65.1 | 21.4 | 13.6 |
| | Satara | | |
| Made a lesson plan | 88.6 | 5 | 6.4 |
| Talked to parents about child's learning | 65.7 | 31.9 | 2.4 |
| Used any TLM other than textbooks during class | 77.5 | 17.5 | 5.1 |
| Took a book from library | 59.1 | 36.4 | 4.6 |
| Gave students homework | 79.1 | 18.5 | 2.4 |
| Used blackboard during class | 95.3 | 2.3 | 2.3 |
| Made children work in small groups | 74.3 | 19.3 | 6.4 |
| Were absent from school for half a day or more | 15 | 24.5 | 60.5 |
| Taught a group of two or three grades together | 22.3 | 17.1 | 60.7 |
| Helped to prepare or serve mid- day meal | 67.4 | 11.3 | 21.3 |
| Spent more than one hour in filling register | 46.1 | 20.5 | 33.3 |
| Visited cluster or block resource centre | 21 | 42.5 | 36.6 |
| Asked somebody for help for teaching a topic | 29.8 | 31.7 | 38.4 |
| Played a game/sport with children | 41.8 | 38.4 | 19.8 |

### *Working in school: Attitudes and perceptions*

To capture teacher's attitude and perceptions, they were asked whether they agreed or disagreed with certain statements. Their responses were marked on a 5 points scale ranging from "strongly agree" to "strongly disagree". The statements in this section spanned from classroom practices, to whether they know their students well and on their accountability for children's learning to their perceptions about gender based differences in learning outcomes and those based on caste. Table 5.17 and Table 5.18 give the distribution for Nalanda and Satara respectively.

Teachers seem to be enjoying their profession- most respondents reported teaching as their first choice and strongly agreed or agreed with the statement 'I enjoy teaching and interacting with students'. Most also self- reported making 'all possible efforts to teach students well'.

Many of the self- reported perceptions and attitudes are consistent with what teachers have mentioned elsewhere and/ or classroom observations by field surveyors. Majority teachers reported that they make a lesson plan before teaching a class; which is also what is reported in Table 5.16. Didactic mode of teaching is reflected in that 93 percent teachers in Nalanda agreed that the main objective of teaching is to complete the syllabus though the corresponding percent is much lower in Satara at 37. Here too teachers have self- reported that they find 'Sometime I have difficulties in explaining maths to my students'.

## Table 5.17: Teacher's attitudes and perception in Nalanda

| Statements | Strongly Agree | Agree | Neither Agree nor Disagree | Disagree | Strongly disagree |
|---|---|---|---|---|---|
| Teacher who are absent from school should be paid less | 36.5 | 19 | 27 | 11.7 | 5.8 |
| I know all students I teach | 44.5 | 36.5 | 10.9 | 7.3 | 0.7 |
| SC/ ST students are less intelligent in comparison to other students | 6.9 | 12 | 11.3 | 44.2 | 25.5 |
| If a child is absent for more than a week, I try to find out the reason | 71.5 | 26.6 | 0.7 | 0.4 | 0.7 |
| If children don't learn well, it is the parents' responsibility | 22.6 | 36.5 | 14.6 | 24.1 | 2.2 |
| Teachers whose students learn more should get higher salary | 16.8 | 17.2 | 28.1 | 26.3 | 11.7 |
| I always make a lesson plan before teaching a class | 63.5 | 33.9 | 1.1 | 0.7 | 0.7 |
| The textbooks are too difficult for children | 6.6 | 14.2 | 12.8 | 51.8 | 14.6 |
| It is important for boys to complete schooling (till Class 12th) | 77.4 | 17.9 | 0.7 | 1.1 | 2.9 |
| It is important for girls to complete schooling (till Class 12th) | 83.9 | 13.5 | 0 | 0.4 | 2.2 |
| Sometime I have difficulties in explaining math to my students | 17.9 | 47.8 | 11.3 | 18.2 | 4.7 |
| I enjoy teaching and interacting with students | 71.9 | 27.4 | 0 | 0.7 | 0 |
| Boys are better in studies than girls | 9.9 | 12.4 | 12.8 | 52.6 | 12.4 |
| Boys are better at Math and Science compared to girls | 8.4 | 16.4 | 11.7 | 49.6 | 13.9 |
| To do well, students need private tuition as well as regular school | 11.7 | 23.7 | 13.9 | 37.2 | 13.5 |
| School does everything that can help children learn well | 67.5 | 30.7 | 0 | 1.5 | 0.4 |
| My objective as a teacher is to complete the syllabus | 65 | 28.1 | 1.8 | 4 | 1.1 |
| I have met the parents of all of my students | 38.3 | 36.1 | 9.9 | 14.6 | 1.1 |
| I often make children in my class work in groups | 40.5 | 50.7 | 5.5 | 2.9 | 0.4 |
| Teaching was my first choice of jobs | 66.8 | 28.1 | 2.2 | 2.6 | 0.4 |
| It is important for boys to focus on their studies because they have to support | 41.6 | 33.2 | 4.7 | 15.3 | 5.1 |
| It is important for girls to focus on household chores as they have to take care | 6.6 | 13.5 | 7.3 | 49.3 | 23.4 |

## Table 5.18: Teacher's attitudes and perception in Satara

| Statement | Strongly Agree | Agree | Neither Agree Nor Disagree | Disagree | Strongly disagree |
|---|---|---|---|---|---|
| Teacher who are absent from school should be paid less | 32.5 | 26 | 13.1 | 24.3 | 4.1 |
| I know all students I teach | 59.5 | 32 | 5.9 | 2.6 | 0 |
| SC/ ST students are less intelligent in comparison to other students | 5.9 | 5.7 | 10.5 | 49.9 | 28 |
| If a child is absent for more than a week, I try to find out the reason | 59.8 | 37.6 | 1.4 | 0.2 | 1 |
| If children don't learn well, it is the parents' responsibility | 7.4 | 20.3 | 23.9 | 42.5 | 6 |
| Teachers whose students learn more should get higher salary | 8.8 | 11.9 | 10.7 | 46.8 | 21.7 |
| I always make a lesson plan before teaching a class | 76.5 | 22.6 | 0 | 0.5 | 0.5 |
| The textbooks are too difficult for children | 4 | 9.8 | 16.4 | 58.8 | 11 |
| It is important for boys to complete schooling (till Class 12th) | 60.7 | 28.6 | 1.7 | 5.5 | 3.6 |
| It is important for girls to complete schooling (till Class 12th) | 68.7 | 23.7 | 0.5 | 5.2 | 1.9 |
| Sometime I have difficulties in explaining maths to my students | 7.8 | 46.2 | 13.1 | 26.1 | 6.8 |
| I enjoy teaching and interacting with students | 67 | 30.4 | 0.5 | 1.2 | 1 |
| Boys are better in studies than girls | 2.6 | 4.7 | 16.6 | 63.3 | 12.8 |
| Boys are better at Math and Science compared to girls | 3.3 | 8.3 | 11 | 63.3 | 14 |
| To do well, students need private tuition as well as regular school | 3.3 | 4.5 | 10.5 | 54.6 | 27.1 |
| School does everything that can help children learn well | 45.2 | 45 | 6 | 2.6 | 1.2 |
| My objective as a teacher is to complete the syllabus | 17.6 | 19.5 | 6.7 | 43.3 | 12.9 |
| I have met the parents of all of my students | 33.3 | 52.7 | 8.3 | 5.5 | 0.2 |
| I often make children in my class work in groups | 34.7 | 51.3 | 6.9 | 6.7 | 0.5 |
| Teaching was my first choice of jobs | 52.6 | 37.6 | 3.8 | 4.8 | 1.2 |
| It is important for boys to focus on their studies because they have to support | 32.8 | 33.5 | 10.9 | 18.1 | 4.8 |
| It is important for girls to focus on household chores as they have to take care | 8.1 | 13.8 | 11.4 | 45.6 | 21.1 |

But certain other self- reported perceptions are not backed up with empirical evidence. For example, while majority teachers have reported that they make children work in groups, this is not validated by the observations of the surveyors. About 91 percent teachers surveyed in Nalanda and 88 percent teachers in Satara said they often make children work in groups, however in only 1.8 percent classrooms in Nalanda and 6 percent classrooms in Satara teachers were actually seen to children work in groups. Similarly, 82 percent teachers in Nalanda and 78 percent teachers in Satara reported that they often made use of TLM other than text books. However, in only 1.8 percent and 10 percent classrooms in Nalanda and Satara respectively, it was observed that teachers were making use of TLM other than textbooks. This discrepancy perhaps highlight that teachers are aware of the advantages of participative teaching methods over lectures (and are, therefore, reporting the "correct" response) even though they are unable or willing to use them in classrooms. Likewise, about 81 percent and 92 percent of teachers in Nalanda and Satara respectively claimed that they know the names of their students, this is not supported by classroom observations. A very small proportion of teachers agree that 'Textbooks are too difficult for children', which is belied by scores in the learning assessment tests.

Statements that deal with teaching accountability found limited support from teachers; instead the burden for children's lack of learning was sought to be placed squarely on the shoulders of the parents, particularly in Nalanda (as compared to Satara). About half of surveyed teachers disagreed that teachers' salary ought to be linked with their absenteeism; fewer still agreed that it should be linked with the learning levels of their children. About 59 percent teachers in Nalanda either strongly agreed or agreed with the statement that 'If children do not learn well, it is parent's responsibility'. The corresponding percentage for Satara is 28. Similarly, 35 percent teachers in Nalanda strongly agreed or agreed with the statement 'To do well, children need private tuition as well as regular school'. In Satara, only 7.8 percent strongly agreed/ agreed that there is need for private tuition for a child to do well in studies.

Finally, as far as perception of students by their caste or gender is concerned, there are still a significant percent of teachers who hold biased opinions, which should be of concern. For example, in Nalanda about 19 percent of teachers believe that 'SC/ ST students are less

intelligent in comparison to other students'; correspondingly 22 percent believe that 'Boys are better in studies than girls'. The corresponding percentages are about 12 and 7 in Satara.

## 5.6 Conclusion

To conclude, a peek into the supply side of middle schooling, indicates that the situation is far from "satisfactory". Nalanda, in particular, needs schools that have integrated upper primary and secondary sections. Attendance is not close to universal; a fact which is also backed by evidence from the baseline. Since it can be reasonably hypothesized that better attendance leads to better learning outcomes, reasons for poor attendance remain to be probed.

Provision of basic infrastructure is far from satisfactory- for example, many schools have toilets either locked or not usable. Furthermore, libraries and science laboratories which should be the cornerstone of learning are conspicuous by their absence in middle schools.

Overall, Satara seems to be better placed in terms of availability of facilities- both in the school and in the classroom. Schools in Satara perform better than their counterparts in Nalanda as per classroom observations too. There also seems to be a greater sense of teacher accountability in Satara than Nalanda. It remains to be explored if this is due to the fact that a greater proportion of schools in Satara are private/ private aided and there are, in general, better accountability mechanisms in private schools.

Schools in both districts follow traditional teaching methods with heavy incidence on teaching the textbook/syllabus. Activities in classroom revolve around reading, writing and copying from textbooks. Though teachers perceive themselves to be participative in their teaching approaches and report using TLM other than the textbook and making children work in group activities, this was not borne out by classroom observations. However, given that teachers engage in multi- grade and multi- subject teaching (often involving subjects that have little in common such as language and science/ math), engaging in alternative methods of teaching would require significant training. Furthermore, rather worryingly, a non-trivial percentage of teachers- particularly in Nalanda, still hold gender/ caste biased ideas.

# VI. Regression Results

In this final chapter, various factors related to the child's own characteristics, her home and parent characteristics, as well those pertaining to enrolment and school management type are placed in a multivariate framework to assess their relative contribution towards learning outcomes. Following the value added model approach, we also control for the child's baseline scores.

There are two important sets of variables that are missing from this model. First, given the diversity across Indian states, schools in different states operate under quite different policy environments. Education is a concurrent subject and while there are national education programs, like RMSA, for which funds are allocated centrally, states also have many education programs and targets that are specific to their state and funded out of their budgets. These different policy environments that schools operate in need to be controlled in a regression framework. Second, and, more importantly, while we can link children to schools, we cannot link them to teachers and classroom practices observed in the school.[28] While there is evidence that school infrastructure is not correlated with learning outcomes, the importance of what happens in classrooms cannot be emphasized enough.

Therefore, in what follows we present two sets of regression results. One set controls for the policy environment by including state-level fixed effects and the other set controls for school level effects by incorporating school-level fixed effects. The explanatory variables are divided into six broad categories- percentage baseline scores (refers to the scores in the test administered between October 2013 and February 2014), individual characteristics of the child, i.e. age and gender, enrolment characteristics (viz., current class of the sampled child, ever double enrolled and whether the child moved to a new school between 2013 and 2014), household characteristics (caste, affluence as measured by ownership of consumer durables, parents' education- both

[28] A survey of schools is part of the middle school study data collection comprising of a survey of school infrastructure, classroom observations and self-administered interview of teachers. However, while it is possible to link sampled children to schools, it is rather difficult link teachers to sampled children since a single child is taught by many teachers.

mother's and father's education, home language and availability of reading materials), tuition status (that is, whether the child takes private tuition in the concerned subject) and management type of the school. The estimation sample consists of all children who made grade appropriate transitions- that is, from Class 6, they went to Class 7; from Class 7 to Class 8 and from Class 8 to Class 9 (N= 5,315).

We begin by describing average scores of the estimation sample for various subjects at baseline and end line as given in Table 6.1. As discussed in Chapter IV on learning outcomes, the table indicates that for the estimation sample mean percentage scores increased for both the districts and for all subjects between baseline and end line. The largest improvement in percentage mean scores for both the districts taken together is in language or state vernacular and math and English (an almost 9 percentage points increase). The increase in percentage mean scores in science is modest at 5 percentage points. There are inter- state differences, however- the highest percentage point increase in Nalanda is for math, followed by state vernacular, English and science. In contrast, Satara has roughly the same percentage point increase of around 8 percentage points between baseline and end line in Marathi, math and English. The increase in science is modest at 5 percentage points.

Nalanda has experienced a higher percentage point increase than Satara. Given that at baseline Satara had higher mean percentage scores that Nalanda for all subjects except math, this means that the gap between the two districts have narrowed between baseline and end line. That said, Satara has higher mean percentage scores than Nalanda in all other subjects even at end line, with the exception of math; and the difference in English is marginal at best just as was the case in baseline.

**Table 6.1: Mean percentage baseline and end line scores, by subject and district**

| Subject Scores | Overall N | Overall mean | Mean for Nalanda | Mean for Satara |
|---|---|---|---|---|
| | Language | | | |
| Baseline | 2663 | 47.94 | 44.81 | 50.35 |
| End line | 2663 | 57.30 | 55.21 | 58.90 |
| Baseline- End line | | 9.36 | 10.4 | 8.55 |
| | Math | | | |
| Baseline | 2896 | 42.91 | 44.89 | 41.19 |
| End line | 2896 | 52.64 | 57.28 | 48.59 |
| Baseline- End line | | 9.73 | 12.39 | 7.4 |
| | Science | | | |
| Baseline | 2611 | 46.13 | 41.90 | 49.34 |
| End line | 2611 | 51.51 | 47.24 | 54.74 |
| Baseline- End line | | 5.38 | 5.34 | 5.4 |
| | English | | | |
| Baseline | 2532 | 42.22 | 41.01 | 43.15 |
| End line | 2532 | 50.97 | 50.63 | 51.23 |
| Baseline- End line | | 8.75 | 9.62 | 8.08 |

Table 6.3 presents descriptive statistics of each of the independent variables in the models. As expected, the number of children in the estimation sample varies across the subject tested; even as the characteristics of the independent variables are similar across the various models with different outcome variables (the exception to this pattern is the percent of sampled children taking private tuitions in a particular subject, which varies considerably across subjects).

Regression results are presented in Table 6.2. The regression models presented in the chapter include baseline scores as one of the explanatory variables. Table A.6.1 in the Appendix presents the same models without including baseline scores as an explanatory variable. In the discussion that follows, we will discuss the regression results for each of the independent variables separately. Descriptive statistics as given in Table 6.3 is used as and when needed to understand the regression results.

**Table 6.2: Regression Results with scores in language, math, science and English as outcome variables**

| | Language scores | | Math scores | | Science scores | | English scores | |
|---|---|---|---|---|---|---|---|---|
| | State level FE^ | School level FE | State level FE^ | School level FE | State level FE^ | School level FE | State level FE^ | School level FE |
| **Previous scores** | | | | | | | | |
| Percentage baseline scores | 0.626*** (0.0202) | 0.621*** (0.0160) | 0.656*** (0.0261) | 0.660*** (0.0149) | 0.554*** (0.0255) | 0.581*** (0.0176) | 0.668*** (0.0280) | 0.699*** (0.0170) |
| **Individual characteristics** | | | | | | | | |
| Age | -0.151 (0.309) | -0.110 (0.209) | 0.301** (0.140) | 0.331* (0.183) | 0.0774 (0.132) | 0.212 (0.151) | 0.0686 (0.141) | 0.162 (0.184) |
| Gender (Reference: Boys) | 1.395** (0.577) | 1.432** (0.612) | -0.637 (0.615) | -0.569 (0.538) | 0.0249 (0.562) | 0.0342 (0.459) | 0.118 (0.747) | -0.00603 (0.558) |
| **Enrolment characteristics** | | | | | | | | |
| Class 8 in 2014 | 0.967 (0.902) | 0.240 (0.800) | 0.648 (0.708) | 0.549 (0.695) | 1.341* (0.700) | 0.825 (0.600) | 0.478 (0.726) | -0.451 (0.732) |
| Class 9 in 2014 | 2.109* (1.069) | 2.077** (0.936) | 2.126** (0.976) | 2.668*** (0.824) | 1.719** (0.730) | 1.250* (0.710) | 0.452 (0.987) | 0.450 (0.857) |
| Ever been double enrolled (Reference: Never double enrolled) | 0.257 (2.259) | 1.376 (2.496) | -1.363 (2.564) | 0.218 (2.167) | -2.238 (2.837) | -2.238 (2.837) | 1.963 (3.581) | 5.882** (2.396) |
| Changed school between 2013 and 2014 (Reference: In same school) | -1.798** (0.733) | -1.096 (1.091) | -1.186 (0.882) | -0.307 (0.943) | -0.576 (0.822) | -0.576 (0.822) | -2.044** (0.966) | -1.937* (1.000) |
| **Household characteristics** | | | | | | | | |
| *Caste* (Reference: General caste) | | | | | | | | |
| SC | -0.997 (1.015) | -0.882 (1.181) | -2.169* (1.152) | -2.675** (1.057) | -0.574 (0.886) | -0.949 (0.891) | -1.989* (1.050) | -0.886 (1.086) |
| ST | 1.908 (1.516) | 2.663 (2.502) | 1.013 (2.305) | 1.633 (2.296) | -1.043 (1.908) | -0.276 (1.870) | -1.594 (1.743) | -0.504 (2.358) |
| OBC | 0.133 (0.920) | 0.374 (0.994) | 1.168 (0.786) | 1.110 (0.881) | 0.0518 (0.587) | -0.169 (0.740) | -0.0804 (0.823) | 0.651 (0.899) |
| EBC | -0.0743 (0.959) | 0.342 (1.120) | 1.505 (0.928) | 0.961 (0.998) | 0.381 (0.602) | 0.168 (0.846) | -1.272 (0.908) | -0.308 (1.036) |
| Other | 1.463 (1.358) | 1.114 (1.373) | 1.525 (1.470) | -0.564 (1.184) | 2.353** (0.944) | 1.214 (1.036) | 2.189 (1.730) | 0.303 (1.253) |
| Muslims | -5.060*** (1.657) | -5.249*** (1.881) | -1.053 (1.697) | -0.152 (1.627) | -3.244** (1.584) | -3.587** (1.448) | -0.333 (2.094) | -0.0721 (1.698) |

**Table 6.2: Regression Results with scores in language, math, science and English as outcome variables (contd.)**

| | Language scores | | Math scores | | Science scores | | English scores | |
|---|---|---|---|---|---|---|---|---|
| | State level FE^ | School level FE | State level FE^ | School level FE | State level FE^ | School level FE | State level FE^ | School level FE |
| **Household characteristics** | | | | | | | | |
| *Affluence* (Reference: Poorest) | | | | | | | | |
| Medium | 0.682 (1.124) | 1.140 (0.935) | 0.0233 (0.859) | 0.570 (0.798) | -0.127 (0.785) | -0.259 (0.706) | 0.925 (0.911) | 0.784 (0.854) |
| Well- off | 1.845 (1.265) | 2.049* (1.198) | 1.310 (1.058) | 1.829* (1.056) | -0.103 (0.990) | -0.586 (0.903) | 1.749 (1.263) | 0.716 (1.098) |
| Mother's education | 0.165 (0.107) | 0.111 (0.0858) | 0.152** (0.0720) | 0.0918 (0.0763) | 0.182** (0.0720) | 0.139** (0.0639) | 0.127 (0.0805) | 0.131* (0.0776) |
| Father's education | 0.247*** (0.0786) | 0.239*** (0.0817) | 0.203*** (0.0637) | 0.159** (0.0661) | 0.265*** (0.0582) | 0.210*** (0.0609) | 0.320*** (0.0907) | 0.262*** (0.0748) |
| Home language is different from state vernacular (Reference: Both are same) | 0.579 (3.08) | 4.122 (3.551) | -0.153 (3.195) | 2.119 (3.075) | 2.295 (1.779) | 5.389** (2.704) | -0.582 (2.218) | 0.784 (3.334) |
| Household without reading materials (Reference category: Households with no reading materials) | -0.466 (0.641) | -0.938 (0.705) | -0.156 (0.742) | -0.208 (0.623) | -0.346 (0.552) | -0.648 (0.526) | -0.317 (0.671) | -0.839 (0.641) |
| **Tuition status** | | | | | | | | |
| Attends tuition classes (Reference: Does not attend tuition classes) | -0.728 (1.03) | -1.615* (0.964) | 1.385 (0.924) | 0.822 (0.698) | 2.021** (0.772) | 1.690*** (0.637) | 1.109 (0.940) | 0.103 (0.728) |
| **Management type of school** | | | | | | | | |
| Management type- Private (Reference: Government) | -0.163 (0.966) | -0.716 (1.233) | -0.150 (0.903) | 1.107 (1.075) | 0.769 (0.972) | 0.0366 (0.904) | -1.048 (1.074) | -0.785 (1.104) |
| N | 2,633 | 2,633 | 2,896 | 2,896 | 2,611 | 2,611 | 2,532 | 2,532 |

^ Standard errors are clustered at the village level.
Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

**Table 6.3: Incidence of independent variable used in the regression analysis in the estimation sample**

| Particulars. | Language or state vernacular | Math | Science | English |
|---|---|---|---|---|
| Number of children who are in the estimation sample | 2,663 | 2,896 | 2,611 | 2,532 |
| Percent girls | 49.19 | 48.58 | 49.25 | 49.29 |
| Percent children in Class 7 in 2014 | 31.58 | 31.60 | 31.18 | 31.00 |
| Percent children in Class 8 in 2014 | 34.40 | 34.77 | 34.93 | 34.91 |
| Percent children in Class 9 in 2014 | 34.02 | 33.63 | 33.90 | 34.08 |
| Average age in Class 7 | 11.60 | 11.61 | 11.57 | 11.58 |
| Average age in Class 8 | 12.55 | 12.55 | 12.56 | 12.55 |
| Average age in Class 9 | 13.37 | 13.37 | 13.35 | 13.37 |
| Percent of children double enrolled | 1.99 | 1.90 | 1.99 | 1.94 |
| Percent of children who have moved to a new school between 2013 and 2014 | 20.77 | 21.48 | 20.80 | 21.13 |
| Percent “general” children | 32.26 | 31.80 | 33.09 | 33.25 |
| Percent SC children | 11.38 | 11.05 | 10.92 | 10.82 |
| Percent ST children | 1.54 | 1.42 | 1.53 | 1.42 |
| Percent OBC children | 21.89 | 22.17 | 21.98 | 21.72 |
| Percent EBC children | 15.81 | 15.33 | 15.36 | 15.32 |
| Percent “other” children | 12.96 | 13.98 | 13.25 | 13.51 |
| Percent Muslim children | 4.17 | 4.25 | 3.87 | 3.95 |
| Percent “poor” children | 15.70 | 16.85 | 15.36 | 15.60 |
| Percent “medium” children | 53.40 | 53.25 | 53.12 | 53.12 |
| Percent “well- off” children | 30.90 | 29.90 | 31.52 | 31.28 |
| Average mother's education (years) | 5.62 | 5.43 | 5.68 | 5.69 |
| Average father's education (years) | 8.26 | 8.15 | 8.29 | 8.32 |
| Percentage children with home language different from state vernacular | 0.75 | 0.76 | 0.73 | 0.71 |
| Percent children in households with reading materials | 48.37 | 47.24 | 48.68 | 48.26 |
| Percent children with tuition | 16.00 | 38.09 | 21.52 | 30.13 |
| Percent children in private schools | 45.81 | 42.92 | 45.65 | 45.77 |

### 6.1 Baseline scores

As expected, baseline scores are very good predictors of the end line score. In all the regression models and for all the four subjects, baseline scores have a positive and statistically significant coefficient.

### 6.2 Individual characteristics

In a bivariate framework, as indicated in Table 6.4, gender differences are *not always* significant and moreover, it is not always the case that boys outperform girls (see Satara and scores in Hindi for Nalanda, for example). Furthermore, these differences largely disappear in a multivariate framework. Regression results in Table 6.2 indicate that gender differences are significant only for language, where girls have on average higher scores than boys. Appendix Table A.6.1 without the baseline scores as an independent variable indicates that gender difference are significant for language and math. In language, girls appear to have an advantage over boys; while boys have an advantage over girls in case of math. Including baseline scores in the regression model, changes the result only for math wherein gender differences disappear.

**Table 6.4: Mean percentage scores at baseline and end line for all subjects, by gender**

| | Overall | | Nalanda | | Satara | |
|---|---|---|---|---|---|---|
| Subject scores | Boys | Girls | Boys | Girls | Boys | Girls |
| | Language | | | | | |
| Baseline | 47.29 | 48.62 | 46.49 | 43.20*** | 47.87 | 53.03*** |
| End line | 56.13 | 58.51*** | 56.32 | 54.13* | 55.99 | 62.07*** |
| | Math | | | | | |
| Baseline | 44.83 | 40.89*** | 49.52 | 40.10*** | 40.81 | 41.60 |
| End line | 54.15 | 51.04*** | 60.65 | 53.80*** | 48.60 | 48.58 |
| | Science | | | | | |
| Baseline | 47.18 | 45.06*** | 43.83 | 40.00*** | 49.63 | 49.03 |
| End line | 52.07 | 50.94** | 48.38 | 46.11*** | 54.75 | 54.73 |
| | English | | | | | |
| Baseline | 42.29 | 42.16 | 43.25 | 38.79*** | 41.58 | 44.81*** |
| End line | 50.82 | 51.12 | 52.51 | 48.75*** | 49.57 | 52.97*** |

**** p < 0.01, ** p < 0.05, * p < 0.10; two- tailed test, mean score (Male)!= mean score (Female)

Age is the other variable that we consider under individual characteristics. Age does not emerge as a significant variable in the regression models (except in the case where math is the outcome variable). In other words, controlling for current class, it is not the case that older children have a learning advantage. The age effect could go away either because older children are the ones who are lagging and therefore, do worse. Or, it could be that the younger children are doing worse because they are not in the appropriate class. If children start grade 1 at age 6/7, then they should be of ages 12/ 13 in grade 7, ages 13/14 in grade 8 and ages 14/ 15 in grade 9. Average age of children (Table 6.3) is around 12 years for grade 7, 13 years for grade 8 and grade 9. This indicates that most children are in age appropriate grades and the incidence of older children in lower grades is trivial.

### 6.3 Enrolment characteristics

We consider here three variables- current class in the year 2014 (that is, at end line), whether the sampled child was ever enrolled simultaneously in a government and a private school (that is, double enrolment as captured during the course of the study) and whether she switched schools during the time frame of the study (that is, between 2013- 14 and 2014- 15). Table 6.5 presents mean baseline and end line scores by each of these factors.

Simple cross tabulations indicate significant statistical differences across all the enrolment parameters. Children learn as they proceed to higher grades. These differences are significant for all subjects and in assessments administered at both baseline and end line and in the regression models presented in Appendix Table A.6.1 without baseline scores as one of the explanatory variables. This is not a surprising result as one would expect improved learning levels in higher grades. But in the multivariate regression model (see Table 6.2), we find that compared to the reference class of 7, being in Class 8 is not associated with higher statistically significant scores. But Class 9 has better and statistically significant scores vis-à-vis Class 7. This result holds for language, math and science scores. In case of English, there is no significant difference in scores between Class 7 and higher grades. The latter indicates that, all else remaining the same, not much is gained in terms English learning levels with each successive higher grades at upper primary levels.

**Table 6.5: Mean baseline and end line scores by enrolled class, double enrolment and transition to a new school**

| | Current class in academic year 2014 | | | Double enrolment | | Transition to a new school | |
|---|---|---|---|---|---|---|---|
| Subject scores | Class 7 | Class 8 | Class 9 | Ever double enrolled | Never double enrolled | New school | Same school |
| | Language | | | | | | |
| Baseline | 42.57 | 48.88*** | 51.99*** | 50.13 | 47.90 | 50.88 | 47.18*** |
| End line | 53.20 | 57.86*** | 60.53*** | 58.93 | 57.26 | 58.29 | 57.04 |
| | Math | | | | | | |
| Baseline | 38.11 | 43.47*** | 46.85*** | 50.88 | 42.76*** | 49.09 | 41.23*** |
| End line | 48.37 | 52.69*** | 56.59*** | 59.44 | 52.51*** | 57.66 | 51.26** |
| | Science | | | | | | |
| Baseline | 41.57 | 46.42*** | 50.03*** | 44.77 | 46.16 | 47.11 | 45.88** |
| End line | 47.89 | 51.93*** | 54.40*** | 47.62 | 51.59 | 51.34 | 51.56 |
| | English | | | | | | |
| Baseline | 36.09 | 42.89*** | 45.46*** | 47.53 | 42.12** | 45.38 | 41.38*** |
| End line | 45.29 | 51.66*** | 52.95*** | 56.38 | 50.86** | 52.15 | 50.65* |

**** p < 0.01, ** p < 0.05, * p < 0.10; one- tailed test, mean score (Class 9) > mean score (Class 7) and mean score (Class 8)> mean score (Class 7); one- tailed test for mean score (Ever double enrolled)> mean score (Never double enrolled); two tailed test for mean score (New school)!= mean score (Same school)

About 2 percent of the children in the estimation sample were ever enrolled in a government and private school simultaneously (referred to here as "double" enrolment). Children in the study were asked about double enrolment in both the survey years (that is, 2013 and 2014). Therefore, children in the estimation sample could be ever double enrolled in either of or both the years. Table 6.5 indicates that double enrolment is associated with higher significant scores only in the case of math and English. Yet again these differences are not significant in a regression framework except for English. Students who are double enrolled score about 6 percentage points higher in English compared to students who have never been double enrolled. This is perhaps not a surprising result since one of the main attractions of simultaneous enrolment in government and private schools is the latter's focus on English instruction.

About 21 percent of children in our estimation sample switched schools between 2013 and 2014. Uncontrolled descriptive statistics indicate that switching schools between the academic years (2013- 14 and 2014- 15) offers statistically significant advantages in scores as

compared to staying in the same school. In the multiple regression models, these advantages disappear or are even reversed in some cases. But this is not surprising; in a multivariate framework we also take into account current class- majority of the cases who have transitioned to a new school are also in grade 9 (about 57 percent of the children who have transitioned to a new school in the estimation sample for state vernacular are in grade 9).

### 6.4 Household characteristics

Home background characteristics that we take into consideration are caste, economic class, parents' education level, home language and ownership of reading materials. We hypothesize that children from poor and marginalized communities have low learning levels as do children whose parents have lower levels of education, belong to households where home language is different from state vernacular and do not own *any* reading materials.

**Table 6.6: Mean baseline and end line scores, by caste**

| Subject scores | General | SC | ST | OBC | EBC | Other | Muslim |
|---|---|---|---|---|---|---|---|
| | Language | | | | | | |
| Baselne | 51.54 | 43.09*** | 49.02 | 50.15 | 44.50 | 43.99*** | 46.70*** |
| End line | 60.35 | 52.72*** | 59.51 | 58.93* | 54.51*** | 55.83*** | 51.89*** |
| | Math | | | | | | |
| Baseline | 42.94 | 37.50*** | 41.16 | 47.28*** | 41.34*** | 44.14 | 36.06*** |
| End line | 50.73 | 46.19*** | 50.13 | 56.83*** | 53.01* | 57.20*** | 46.22** |
| | Science | | | | | | |
| Baseline | 49.16 | 42.79*** | 50.88 | 48.14 | 43.74*** | 39.96*** | 47.07 |
| End line | 54.77 | 48.38*** | 53.01 | 52.25*** | 49.35*** | 47.81*** | 48.99*** |
| | English | | | | | | |
| Baseline | 45.13 | 37.63*** | 44.44 | 43.56 | 38.90*** | 39.61*** | 44.03 |
| End line | 53.55 | 45.44*** | 50.24 | 52.03 | 47.05*** | 51.50 | 52.15 |

**** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$, mean score (General)!= mean score (SC), mean score (General)!= mean score (ST) and so on for each of the caste groups.

Table 6.6 indicates that there are uncontrolled caste differences in scores and but it is not always the case that general castes have higher scores than marginalized caste groups- see, in particular, math scores for general castes and OBCs and EBCs. However, in the regression framework (Table 6.2) caste differences are insignificant except in few instances. For example, sampled children from scheduled caste families have lower math scores compared to children from general caste families. Caste effect is not emerging as significant

in a regression framework because caste based advantages or disadvantages are getting captured by other household factors.

**Table 6.7: Mean baseline and end line scores, by economic class**

| Subject scores | Poor | Middle | Upper |
|---|---|---|---|
| | Language | | |
| Baseline | 40.77 | 46.61*** | 53.89*** |
| End line | 50.95 | 56.16*** | 62.49*** |
| | Math | | |
| Baseline | 40.05 | 42.17** | 45.86*** |
| End line | 51.76 | 52.29 | 53.75** |
| | Science | | |
| Baseline | 40.74 | 44.68*** | 51.21*** |
| End line | 46.46 | 50.13*** | 56.31*** |
| | English | | |
| Baseline | 36.59 | 40.07*** | 48.70*** |
| End line | 45.32 | 49.36*** | 56.51*** |

**** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$; one- tailed test, mean score (Poor) < mean score (Middle) and mean score (Poor) < mean score (Upper).

Similarly, the differences in learning levels across affluence categories are significant in a bivariate framework, but the affluence effect disappears in a multi-regression model. Belonging to an economically better- off household does not guarantee higher scores except for language and math- contrary to what one would expect viz., that children from well- off families have on average higher percentage scores than poorer households.

Parental education has a positive and significant effect on their child's learning outcome at both baseline and end line (Table 6.8). In case of math and English, however, only upper primary education and beyond has a positive impact on learning levels. In regression models incorporating baseline scores[29], mother's education is not significant for language scores. In case of math, the significance disappears in the school fixed effects model. Mother's education has a significant coefficient in case of both state and school level FE model when the outcome variables are science and English scores. At the upper primary level, the regression models seem to suggest that father's education plays an important role.

[29] In Appendix Table 6.1, the coefficients for parental education are positive and significant.

In all the regression models and for all the subject scores, it is positively correlated with learning levels.

**Table 6.8: Mean baseline and end line scores, by parent's education**

| | Mother's education | | | Father's education | | |
|---|---|---|---|---|---|---|
| Subject scores | Illiterate | Some primary education | Beyond primary education | Illiterate | Some primary education | Beyond primary education |
| | Language | | | | | |
| Baseline | 41.13 | 47.00*** | 52.14*** | 38.55 | 41.90** | 50.25*** |
| End line | 51.70 | 55.09*** | 60.98*** | 48.91 | 51.45* | 59.41*** |
| | Math | | | | | |
| Baseline | 40.68 | 39.95 | 44.89*** | 38.35 | 36.10 | 44.61*** |
| End line | 52.93 | 48.56 | 53.14 | 50.55 | 46.53 | 53.77*** |
| | Science | | | | | |
| Baseline | 40.74 | 43.97*** | 49.61*** | 40.19 | 42.68*** | 47.55*** |
| End line | 45.71 | 50.61*** | 55.02*** | 44.70 | 47.49*** | 53.14*** |
| | English | | | | | |
| Baseline | 36.99 | 38.45 | 45.87*** | 34.65 | 35.46 | 44.27*** |
| End line | 46.28 | 47.19 | 54.30*** | 43.54 | 43.51 | 53.07*** |

**** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$, mean score (Illiterate)< mean score (Some primary education), mean score (Illiterate)< mean score (Beyond primary education).

While the descriptive statistics in Table 6.9 indicates that ownership of reading materials makes a difference to learning outcomes, in the regression framework with baseline scores as one of the explanatory variables the effect of ownership of reading materials vanishes (Table 6.2), but has a significant effect in the regression model which does not include baseline score as an independent variable (Appendix Table A.6.1).

Less than 1 percent of children in the estimation sample have home language different from state vernacular.[30] Having a home language same as state vernacular does not give additional advantage and the difference is not significant. Perhaps the lack of variation in home language of sampled children is the reason why there is not a significant home language effect.

[30] The different languages that have been reported are Bengali, Magadhi, Maithili, Bhojpuri, Kannada and Urdu.

**Table 6.9: Mean baseline and end line scores, by ownership of reading materials and home language**

| | Reading materials | | Home language | |
|---|---|---|---|---|
| Subject scores | Without any reading materials | With some reading materials | Same as state vernacular | Different from state vernacular |
| | Language | | | |
| Baseline | 44.49 | 51.63*** | 48.01 | 38.5** |
| End line | 54.48 | 60.30*** | 57.35 | 50.5* |
| | Math | | | |
| Baseline | 41.16 | 44.87** | 43.01 | 30.56*** |
| End line | 51.89 | 53.47** | 52.71 | 43.64** |
| | Science | | | |
| Baseline | 49.06 | 43.36*** | 46.18 | 39.94** |
| End line | 48.99 | 54.17*** | 51.53 | 48.84 |
| | English | | | |
| Baseline | 38.83 | 45.87*** | 42.25 | 38.89 |
| End line | 48.05 | 54.10*** | 51.00 | 46.33 |

**** p < 0.01, ** p < 0.05, * p < 0.10, mean score (without any reading materials)< mean score (with reading materials), mean score (home language different from state language)< mean score (home language same as state vernacular).

## 6.5 Tuition status

The tuition status of sampled children was as recorded at the baseline visit (and not at end line visit). The percent of sampled children taking tuitions varies from 16 percent for state vernacular to 38 percent and 30 percent for math and English respectively. The tuition effect is ambiguous- one can expect that if a child attends private tuitions, it yields better learning outcomes. But it could also be the case that tuitions help a child catch up with his peers, in which case there would not be a significant difference in learning outcomes of children with and without private tuitions. Table 6.10 reveals that there is a significant tuition effect in all subjects except science. While private tuition helps to get higher scores in math and English, in case of state vernacular it helps to only bridge the gap between students who take and do not take private tuitions. Rather interestingly, the tuition effect is positive and significant only in case of science in a regression framework (Table 6.2).

**Table 6.10: Mean baseline and end line scores, by tuition status and school management type**

| | Tuition status | | Management type | |
|---|---|---|---|---|
| Subject scores | Without tuition in the particular subject | With tuition in the particular subject | Government | Private |
| | Language | | | |
| Baseline | 48.47 | 45.20*** | 45.34 | 51.02*** |
| End line | 57.78 | 54.77*** | 55.31 | 59.65*** |
| | Math | | | |
| Baseline | 39.91 | 47.79*** | 43.36 | 42.33*** |
| End line | 48.81 | 58.85*** | 54.49 | 50.18*** |
| | Science | | | |
| Baseline | 46.01 | 46.58 | 42.67 | 50.26*** |
| End line | 51.34 | 52.12 | 48.17 | 55.49*** |
| | English | | | |
| Baseline | 41.23 | 44.53*** | 39.88 | 45.00*** |
| End line | 49.80 | 53.68*** | 49.59 | 52.60*** |

**** p < 0.01, ** p < 0.05, * p < 0.10, mean score (without tuition)!=mean score (with tuition), mean score (government)!=mean score (private)

## 6.6 School management type

School management type was recorded at base line and not end line. However, since most children remained in the same schools (about 70 percent in the estimation sample), it is safe to assume that not much information is lost by not taking into account school management type at end line. Table 6.10 indicates that there is a private school effect- private schools outperform government schools (except for math where in the end line government schools perform significantly better). However, as with other factors, it does not emerge as a significant variable in the regression models. That said, one must interpret the management type variable with caution. There are hardly any private schools in Nalanda- only 7 percent of sampled children reported attending private schools. Second, a measurement error most likely occurred in reporting of management type in Satara. Management type of schools was self-reported in the base line visit by parents. In Satara, most of the schools are private aided (and hence, they ought to be recorded as private) but parents have often reported it as government schools as a result we are not able to cleanly disaggregate schools by management type.

## 6.7 Conclusion

In conclusion, while coefficients are by and large robust to school fixed effects, a lot of the standard variables that we expect to be important correlates of learning show up as insignificant in a multivariate analysis – most of these are significant in a bivariate context and in a multivariate models without baseline scores as explanatory variables. This is because the baseline score of the child captures all these other characteristics.

# VII. Conclusion

The study provides a close look at educational trajectories of children at the post-primary level in two very different contexts. Its findings repudiate the assumption that transition through grades corresponds to grade-appropriate learning. This is far from reality for many children in both districts covered in this study: the more economically and educationally backward Nalanda in Bihar as well as the less disadvantaged Satara in Maharashtra.

The fact that 13.6 percent of upper-primary children who made grade appropriate transitions could not read a grade 2 level text fluently and 10 percent could not solve subtraction problems is appalling. Large numbers of children without foundational skills in math and language move smoothly 'upward' through school system. Guaranteeing quality secondary education for all children requires that this problem be urgently addressed.

In addition, the report provides information on children's performance in different competencies in four subjects which can serve as important feedback into curriculum development, academic resource planning and teacher training.

The analysis of classroom practices underscores the distance between the National Curriculum Framework objectives and the reality on the ground. The classroom data highlights the lack of use of teaching learning material (TLM) in classrooms and group activities among children, among other issues. The existence of multi-grade teaching aggravates the complexity of teaching children with different learning levels. Given the heavy emphasis on textbooks where 'grade appropriate competency' is the construct that underpins the textbook, the majority of children who are far below the grade appropriate learning level remain stuck in low learning level trap.

With the shift in focus from inputs to outcomes and from primary to secondary education, the 6$^{th}$ Joint Review Mission (JRM) of the Rashtriya Madhyamik Shiksha Mission (RMSA) has stressed the need for surveys looking at overall and subject-wise learning levels. In addition to the many policy issues highlighted by its findings, this study can also provide a variety of insights into how such assessments can be designed and conducted.

# VIII. Annexure: Review of policy on post- primary education

This review of policy of post- primary education in India is divided into three sections. Section A provides a situational analysis of upper primary and secondary school scenario in India. Section B summarizes key central government policies pertaining to post- primary education. Section C lists some of the challenges facing post- primary education in India. In all the discussion that follows, we have presented the latest figures.

### A.1 Situation analysis: upper primary and secondary school scenario

After a decade of channelizing planning efforts and resources towards universalization of elementary education, India has attained near 100 per cent enrolment at primary education level. With the number of children graduating from primary schools increasing rapidly, access to upper primary and secondary education will need to expand. Lack of upper primary and secondary schooling can hamper the completion of elementary education especially by the children of poor households.

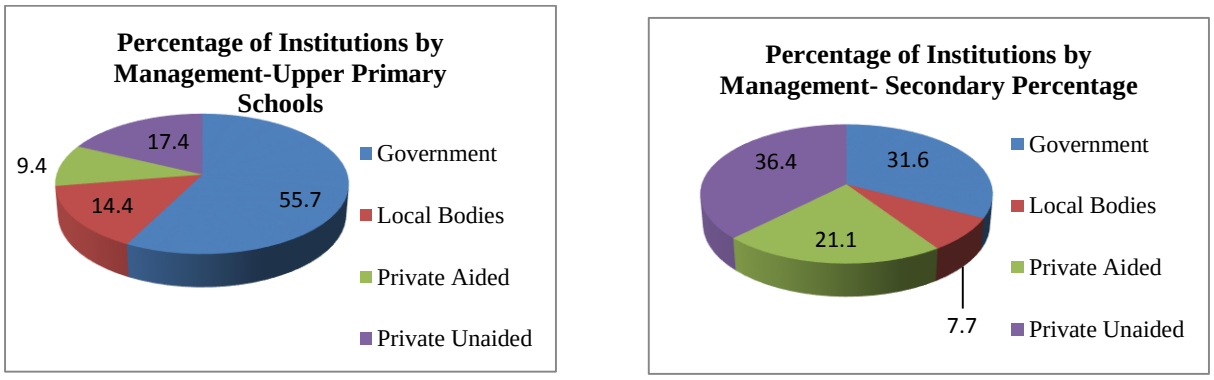
Although near universal access to primary education has been achieved, the quality of education in terms of learning outcomes remains poor. There is a dire need to focus on post primary education not only in terms of expanding access and infrastructure facilities to absorb the increasing demand but also in terms of providing universal access to quality education. It is, thus, imperative to analyse the current upper primary and secondary education scenario so as to identify gaps in access and quality and whether the current policies in this sector address any of these issues.

***Type of Management***

For achieving universalization of elementary education, various Centrally Sponsored Schemes (CSS) are being implemented in India. In an attempt to universalize access, there has been a huge thrust to open new upper primary schools. Of the upper primary schools managed by the government, there are central government schools, state government schools and those managed by local bodies.

In contrast to elementary education, secondary education in India is largely delivered by private entities. Privately managed schools are subdivided into private aided and private unaided schools. Private aided schools are privately owned, however the curricula and fee structure is regulated as per the government norms. On the other hand, private unaided schools are privately owned and regulated.

**Figure A.1: Percentage of institutions by management: Upper primary and Secondary**




Source: Selected Education Statistics (2011-12), Ministry of Human Resource Development (MHRD)

In 2011-12, 70 per cent of upper primary schools[31] were managed by government and local bodies. Only about one fourth upper primary schools were under the purview of private management; out of which 17.4 per cent were private unaided upper primary schools.

About 57.5 per cent of secondary schools[32] in India were privately managed in 2011-12.[33] Out of the private secondary schools, 36.4 per cent were private unaided. Private unaided schools are further categorized into those having government recognition and those which are not recognized by government. The Ministry of Human Resource Development (MHRD) statistics takes into consideration only the recognized private unaided schools. As a result, the number of private schools is highly underestimated in the official.[34]

Over the last two decades, there has been sizable increase in the percentage of private unaided secondary schools. Their percentage has more than doubled from 1993-94 to 2011-12.

Since the upper-primary schools are dominated by government schools and secondary by private schools, access to secondary schooling may also be limited by resources of the poorer households. Not only do parents have to pay for private schooling, but often the fees in secondary grades are higher as compared to middle or primary grades.[35]

***Access, Coverage and Quality of Post Primary Education***

The concept note of Rashtriya Madhyamik Shikshan Abhiyan (RMSA) defines access to education as universal provision of education and universal enrolment of children in schools.

*Geographical Access*

Rashtriya Madhyamik Shikshan Abhiyan (RMSA) emphasizes geographical access to schools as an important factor in bringing about universal provision of secondary education. The objective is to minimise the distance between schools and households by providing schools at a reasonable distance from habitations. Population and distance norms have been specified for ensuring adequacy, accessibility and sustainability of schools.

The norm for upper primary school is that the school should be located within walking distance of 3km for a habitation with population 500 and above. According to the Eighth All India Survey on Education, 85.42 per cent of habitations satisfy this norm.

A secondary school should be situated within 5km from the household. Only 65 per cent of villages in India have secondary schools within the distance of 5 km[36].More than 12% of rural households in India did not have any secondary schools within 5 kilometers whereas in urban areas such cases are insignificant (less than 1%).[37] According to the government source, more than distance

[31] Upper primary schools refer to schools that are up till grade 8.
[32] Secondary schools refer to schools that are up till grade 12.
[33] Recent figures are available from U-DISE, the disaggregation is available (and further disaggregation between private aided and unaided is not available for upper primary) for elementary as whole. http://dise.in/Downloads/Elementary-STRC-2014-15/All-India.pdf
[34] Kingdon (2007), "The progress of school education in India", Global Poverty Research Group
[35] Kingdon (2007), The progress of school education in India, Global Poverty Research Group
[36] Document of The World Bank (2009), "Secondary Education in India: Universalizing Opportunity"
[37] NSSO, 71st Round (2014), "Key Indicators of Social Consumption in India: Education"

it is the remoteness of habitations in rural areas that affects the participation of children in secondary schooling, particularly girls and children with disabilities.[38]

*Enrolment*

Gross Enrolment Ratio (GER) is considered as the basic indicator for coverage of children at a particular level of school. Gross Enrolment Ratio is the total enrolment in a given level of education regardless of age expressed as a percentage of the corresponding eligible official age group in a given school year.

**Table A.1: GER for upper primary and secondary level, by gender and caste (2013- 14)**

| GER Level (2013-2014) | ALL | | | SC | | | ST | | |
|---|---|---|---|---|---|---|---|---|---|
| | Boys | Girls | Total | Boys | Girls | Total | Boys | Girls | Total |
| Upper Primary (VI-VIII) | 84.9 | 90.3 | 87.4 | 93.2 | 96.5 | 94.8 | 86.5 | 85.7 | 86.1 |
| Secondary (IX-X) | 73.5 | 73.7 | 73.6 | 76.0 | 76.2 | 76.1 | 67.5 | 66.7 | 67.1 |

Source: Education Statistics at Glance (2014), National Level Education Statistics, MHRD

Gross Enrolment Ratio (GER) at upper primary level was 87.4 percent in 2013-14. The gross enrolment ratio dropped further to 73.6 percent at secondary level in 2013-14.

*Equity in Enrolment*

GER at secondary level in 2004-05 was about 45.3 percent for girls and 57.4 percent for boys with a gender differential of 12 percent. In 2013-14 there was no gender bias in GER at secondary level. At upper primary level, however, the gender gap was about 5 percent in 2013-14. Finally, while enrollment rates for scheduled castes are higher than the general population, scheduled tribes are clearly at a disadvantage.

*Attendance and Dropout*

Meaningful access requires high attendance rates, progression through grades at the correct age with little or no repetition, and learning outcomes that confirm that basic skills are being mastered. [39] Universal enrolment coupled with high attendance and grade appropriate learning outcomes indicate universalization of school education.

The Gross Attendance Ratio (GAR)[40] for upper primary schools is 92 per cent for boys and 88 per cent for girls. The GAR for rural areas is lower than urban areas. The gross attendance ratio dips further down to 87 per cent for both girls and boys at secondary level.[41]

The level of participation as measured by GAR at various stages of school education varies significantly across different quintile classes of usual monthly per capita consumer expenditure (UMPCE). In both rural and urban India, while only 67 percent people in the lowest UMPCE quintile

[38] NEUPA (2009), "Education Access in India"
[39] NEUPA (2009), "Education Access in India"
[40] Gross attendance ratio (GAR) for each class-group is defined as the ratio of the number of persons in the class-group to the number persons in the corresponding official age-group.
[41] NSSO, 71st Round (2014), "Key Indicators of Social Consumption in India: Education"

class participated (attended) in secondary education, it increased to 105% and 111% respectively for rural and urban for the highest UMPCE quintile class.[42]

Dropout is pervasive in India. The dropout ratio peaks at the end of three levels of schooling i.e. after primary, upper primary and secondary. The dropout was 7.93 per cent in VIII grade in 2014-15.

The deficit in gross enrolment ratio particularly evident at the secondary level needs to be addressed coupled with equitable access to education by socio-economic groups. This deficit and inequity in enrolment and attendance arise from several factors; conservative attitude of parents towards higher education and particularly education of girls, poverty, lack of preschool experiences and supply side factors such as remoteness of habitation, uninspiring teaching methods, lack of facilities in schools, absence of integrated upper primary and secondary schools.

***Quality***

However, more than competed years of schooling, what is far more important is the whether these years in school equip students to be productive members of the labor force and society at large. According to ASER 2014 about 41.2 per cent of VI grade students, 32.3 per cent of VII grade and 25.4 per cent of VIII grade students cannot read a grade 2 level text. The children are far behind the grade competency. Similarly, 67.8 per cent of VI grade students, 62.2 per cent of VII grade students and 56 per cent of VIII grade students cannot solve a division problem commonly seen in grade 3 or grade 4 textbooks[43] Learning deficits in the primary stage only accumulate as children move through the system.

## A.2 Secondary Education: Overview of schemes

In this section, schemes related to secondary education are reviewed with the objective to locate issues and identify the major aspects these schemes focus on as they have a strong bearing on the objective of the twelfth five- year plan of moving towards universalization of access to secondary education. In addition, better access to secondary education increases enrolment and attendance among children in the primary school-going age group and if the costs of post-primary schooling are too high, parents are less interested in their children's education even at the primary stage[44].

***The Rashtriya Madhyamik Shiksha Abhiyan (RMSA)***

The Rashtriya Madhyamik Shiksha Abhiyan (RMSA) was launched in 2009. It aims to bring about universalization of secondary education by making quality secondary education available, accessible and affordable to all.

**Objectives and interventions:**

- Enhance enrolment in IX and X grade with Gross Enrolment Ratio exceeding 90 per cent by 2017

[42] NSSO, 71st Round (2014), "Key Indicators of Social Consumption in India: Education". GAR is the ratio of the number of persons in the class-group to the number persons in the corresponding official age-group. As the persons in a particular class group can belong to age group other than corresponding official age-group, this ratio can be more than 100.
[43] Annual Status of Education Report (Rural) 2014
[44] Mukhopadhyay. A and S. Sahoo (2012), "Does access to secondary education affect primary schooling? Evidence from India"

Intervention**:**
Providing a secondary school within a reasonable distance of every habitation, upgrading upper primary schools to secondary schools, strengthening existing secondary schools, adding additional classrooms, expanding infrastructure and resources in secondary schools

- To improve quality of education imparted at secondary level
  Intervention:
  Teacher training; an improvement in the salaries of teaching and non-teaching staff in new and existing schools; introducing orientation programmes for head teachers and educational planners; special teaching for weaker students; guidance and counselling; introducing student excursions and science fairs; promoting the performing arts and self-defence training, especially for girls; provision of facilities like maths laboratory kit, language and digital communication laboratories, and sports material.
- Remove gender, socio-economic and disability barriers in providing universal access to secondary education
  Intervention:
  Providing hostel and transport facilities particularly for girls; SC/ST-oriented activities (shiksha mahasabha, traditional game meets, traditional arts, craft and dance competitions); interactions with stakeholders and chain agents in SC/ST/minority/tea-tribe-dominated areas; and retention drives for tea-tribe and minority girl students.

**RMSA in the twelfth plan period**

In the twelfth plan period, RMSA primarily focuses on equal access to quality secondary education by including private unaided secondary schools under the purview of the scheme with the view that affordable secondary education is available to all. It amends ceilings to funding infrastructure and enhances share of funds available for Management, Monitoring and Research (MMER). It focuses on making available transport facilities to school for children as an immediate measure in inaccessible areas till the residential schools and hostels are constructed in existing schools.

Recommendations by Working Group on Secondary and Vocational Education for Twelfth Plan Period and Strategies adopted in Twelfth Plan Period (RMSA) and the 12$^{th}$ plan strategy:

Recommendation**:** The fund flow under the scheme had been limited and states were not being able to avail as much benefits as envisaged. To meet the gap between the availability and growing demand for secondary schools, it was recommended to continue the then sharing pattern of 75:25 and include special category states for 90:10 along with North eastern States in 12$^{th}$ Plan period.

12$^{th}$ Plan Strategy**:** In the 12$^{th}$ Plan RMSA continues with 75:25 funding strategy to non – North Eastern Region (NER) states and 90:10 for NER States (including Sikkim). Special category states have not been included for 90:10 funding pattern. However, the scheme commits to move towards funding states on per child cost basis/norms which would incentivize enrolment, retention and completion, and thus move away from inputs-based funding to outcome-based decision-making.

Recommendation: It was observed that non-coverage of aided schools under the ambit of RMSA would deter the goal of universal access to secondary education. It was thus proposed to consider aided schools under the scheme for 12$^{th}$ Plan year plan.

12$^{th}$ Plan Strategy**:** The benefits under RMSA have been extended to aided schools as well except for infrastructure support, i.e., teacher's salary and staff salary. The twelfth plan recognises the role of

private aided schools in encouraging local participation and filling the gap that exists in interior areas. The twelfth plan considers devising a good regulatory mechanism designed to ensure quality of private aided schools as a preferable option over governments setting up their own schools and operating with very low levels of enrolments.

Other Revisions made under RMSA in Twelfth Plan Period

- Schemes like Inclusive Education for Disabled at Secondary Stage **(**IEDSS), ICT at schools, Girl's hostel and vocational education are subsumed under RMSA to avoid duplication of intervention under different schemes and for administrative efficiency.
- To enhance access and participation of children from hilly and sparsely populated areas and from districts afflicted with civil strife RMSA will make provisions for residential schools/hostels for boys and girls in existing schools.
- With the financial ceiling for on infrastructure support the whole school approach for providing infrastructure in existing schools was not followed in essence in eleventh year plan. Under twelfth plan, RMSA relaxes ceiling on civil works on infrastructure deficient states.
- The funds of Management, Monitoring Evaluation and Research (MMER) have been enhanced from 2.2 per cent to 4 per cent of the total outlay. However, the rise to 6 per cent of total outlay was recommended by the subgroup to be allotted MMER.

**Targets and physical progress under RMSA**

In the backdrop of objectives set by RMSA, the achievements under the scheme have been studied and areas of concern have been highlighted. The impact of the scheme has been analyzed by looking at the education related indicators prior to and post the implementation of scheme.

Target:

- GER of 90 per cent by the end of Twelfth Plan i.e. 2017
- Gender and social equity in GER

GER reached 76 percent in 2013-14. GER increased by 10.7 percent from 2005-06 to 2009-10 i.e. pre-RMSA period. In post- RMSA period, GER has increased by 13.7 percent from 62.9 in 2009-10 to 76.6 in 2013-14. It is noteworthy that RMSA, with its focus on ameliorating GER particularly of girls, has succeeded in achieving girl's GER nearly equal to that of boys in secondary education. There has been tremendous increase in GER of girls from 2009-10 to 2013-14. The gender gap has diminished; from 11 percentage points in 2005-06 to virtually zero in 2013-14.

**Table A.2: GER for years 2005-06, 2009-10 and 2013-14, by gender, SC and ST**

| 2005-06 | | | 2009-10 | | | 2013-14 | | |
|---|---|---|---|---|---|---|---|---|
| Boys | Girls | Total | Boys | Girls | Total | Boys | Girls | Total |
| ALL | | | ALL | | | ALL | | |
| 57.6 | 46.2 | 52.2 | 66.7 | 58.7 | 62.9 | 73.5 | 73.7 | 73.6 |
| SC | | | SC | | | SC | | |
| 54.8 | 40.3 | 48.1 | 71.2 | 63.9 | 67.8 | 76.0 | 76.2 | 76.1 |
| ST | | | ST | | | ST | | |
| 44.7 | 33 | 39.1 | 55.3 | 45.8 | 50.7 | 67.5 | 66.7 | 67.1 |

Source: Education Statistics at Glance (2014), National Level Education Statistics, MHRD

Even though the overall increase in GER post RMSA is noticeable, GER of Scheduled Tribes remains low. If the target of 90% GER is to be achieved, special focus should be placed on social groups that are still lagging behind.

Target:

- Attain 100 per cent transition and retention at secondary level and 0 drop outs by the end of 2017 i.e. Twelfth Five Year Plan.

The Fifth JRM report states that the transition rate is a more reliable indicator of the performance of RMSA than GER or NER (net enrolment ratio). Although the transition rate is not available for secondary schooling pre- RMSA period, the recent data shows a slight decrease in the transition rate from 91.95 in 2012-13 to 91.58 in 2013-14.[45]

Average dropout rate at national level for secondary was 17.86 percent in 2013-14. This dropout rate is quite substantial considering the goal of 0 dropouts by the end of 2017.[46]

About 81 per cent of children enrolled in grade IX in 2012-13 took the grade X exam in 2013-14. The graduation rate has been rising since 2010-11. This rate is however lowest for government schools and highest for unaided private schools.[47]

**Table A.3: Graduation rate in grade 10th examinations**

| Graduation Rate* | 2010-11 | 2011-12 | 2012-13 | 2013-14 |
|---|---|---|---|---|
| Government | 46.4 | 48.6 | 59.2 | 72.1 |
| Aided | 78.1 | 71 | 75.4 | 89 |
| Unaided | 85.3 | 74.5 | 75.6 | 87.6 |
| Central Government | 48.6 | 68.4 | 70.4 | 73.4 |
| Total | 63.7 | 67.6 | 75.3 | 81 |

*Those who were enrolled in grade IX in year t appearing for board exam in grade X in year t+1.
Source: Fifth Joint Review Mission: Aide Memoire, RMSA.

**Financial status of RMSA**

The allocation for secondary education by Government of India accounts for 9184 Cr in 2015-16. Out of the total amount allocated for secondary education, 38.8 per cent (3565 Cr) has been allocated for RMSA.

From 2009-10 to 2014-15, the amount allocated to RMSA (Revised estimates) has increased six folds.[48]

There are delays in spending. Of the total funds available with states, only 50 percent were spent in FY 2013-14. There are also significant state variations. As of September 2014, Uttar Pradesh had spent 69 percent of its available funds, while West Bengal spent a mere 8 percent. The

[45] Secondary Education in India: Towards Universalisation (2014-15), U-DISE
[46] Secondary Education in India: Towards Universalisation (2014-15), U-DISE
[47] Fifth Joint Review Mission: Aide Memoire, RMSA
[48] Note: 1. The financial allocations for all the schemes have been refereed from Union Budget of India, Expenditure- Volume II, Ministry of Human Resource Development (2009-10 to 2015-16)
2. Physical progress under the schemes subsumed under RMSA (ICT in schools, IEDSS, Girl's hostel and Vocationalisation of Secondary and Higher secondary education) has been referred from RMSA at glance and Status till date, rmsaindia.org

consequence low expenditure is the large unspent amount. This issue of large unspent amount is prevalent since the inception of the scheme.[49]

Civil works and teacher's salary constituted majority of RMSA expenditure in the initial three years of the program. There were no civil works sanctioned in 2012-13. However, from 2013-14 approximately one third of the total outlay is approved under RMSA is for civil works. The share of total outlay approved for teacher's salary declined from 46 per cent in 2013-14 to 36 per cent in 2015-16. Together, civil works and teacher's salary constitute the bulk of the approved outlay in 2015-16.[50] The first RMSA-JRM report noted the danger of insufficient attention and scarce resources being allocated to other activities that may have as significant or even greater impact on the achievement of RMSA. The report brings out the concern of funding large number of teacher in future years which would in a way constrain the ability of programme to meet other needs such as capacity development and training of teachers. On the positive side, the share of total outlay approved for quality, equity and MMER activities is on the upward trend from 2013-14.

***Girl's Hostel Scheme***

Launched in 2008-09, this centrally sponsored scheme is being implemented from 2009-10. This scheme is now subsumed under RMSA.

**Objectives and intervention**

- To retain girls in secondary schools

Intervention

In order to make secondary education accessible to large number of girls and to enable their continuity to secondary education without any hindrance by factors such as distance of secondary school, parent's financial unaffordability, etc., the scheme aims at setting up a 100 bedded girl's hostel in each of the 3479 Educationally Backward Blocks (EBBs) of the country.

- Equitable access to all girls irrespective of economic class and caste

Intervention

Students passing out of Kasturba Gandhi Balika Vidyalaya (KGBV) are given preference for admission in hostels and at least 50% of the girls admitted are from SC, ST, OBC and minority communities.

**Target**

- Setting up a 100 bedded girl's hostel in each of the 3479 Educationally Backward Blocks (EBBs) of the country

**Progress of the scheme**

Out of 3453 EBBs, 2225 Girls Hostels have been approved and 2009 Girls hostel have been sanctioned. Out of total sanctioned hostels, 660 hostels are functional in which 45383 girls are enrolled.[51] In 2013-14, out of the total amount approved (Revised Estimate) for secondary education (10025 Cr), 3.75 per cent (376.25 Cr) was allocated under this scheme. The amount allocated under

[49] Budget Brief (2015-16), RMSA, Centre for Policy Research
[50] Refer Appendix-A.A.1
[51] RMSA at a glance, RMSA: India

this scheme has increased four folds from 2009-10 (80 Cr) to 2013-14 (376.25 Cr). Given that the scheme is subsumed under RMSA no separate allocation has been specified for it from 2014-15.

***ICT in schools***

This scheme was launched in 2004 and revised in 2010. Now ICT in Schools is a component of the RMSA. The project cost is shared between Centre and States in the ratio of 75:25 except for the NER states including Sikkim where it is 90:10.

**Objectives and interventions**

- To promote the usage of ICT especially in higher secondary schools in rural areas, which would enable students to acquire skills needed for higher education and employment and to enhance the curriculum by employing ICT tools for teaching and learning.

Intervention

Providing computer labs with at least 10 networked access points and for smart schools the lab must have at least 40 computers.

**Target**

- To provide ICT enabled environment to government and government aided secondary and higher secondary schools

**Progress**

Till date 85343 schools have been approved and out of the approved schools, 62917 (73.72 percent) schools are implemented under the scheme. In 2013-14, 5.57 per cent (559Cr) of the total amount (10025 Cr) approved (Revised estimates) for secondary education was allocated to this scheme. The funds allocated for this scheme have doubled from Rs. 200 crores in 2007-08 to Rs. 559 crores in 2013-14 This scheme is now subsumed under RMSA and hence there is no separate allocation of funds for it from 2014-15.

The working group on the twelfth five- year plan pointed out the difficulty to achieve the targets set by ICT in the schools with inadequate basic facilities like lack of computer rooms, IT trained teachers, electricity etc. The revision to this scheme incorporates provision of a suitably qualified full time computer teacher in every secondary school.

***Inclusive Education for Disabled at Secondary Stage (IEDSS)***

This scheme was launched in 2009-10 and replaces the scheme 'Integrated Education for Disabled Children (IEDC)'. This scheme has also been subsumed under RMSA.

**Objectives and intervention**

- To provide educational opportunity to children with moderate disability in common schools and to facilitate retention in school system by providing inclusive and enabling environment.

Intervention

The scheme provides assistance to States/Union territories and autonomous bodies at Rs. 3000 per child with disability per year.

- Special focus on girls with disability

Intervention

Girls with disability will be given a monthly stipend of Rs. 200 at secondary level to encourage their participation at senior secondary level.

**Target**

- Make all government and government aided secondary and higher secondary school barrier free for children with special needs

**Progress of the scheme**

Till date, 55.23 per cent of secondary schools have been made barrier free and only 17.09 per cent of secondary schools have disabled friendly toilets. The number of special educators is as less as 3437 for approximately 2.37 lakh children with special needs who are at present covered under this scheme.

In 2013-14, out of the total revised estimate for secondary education, a meagre 0.49 per cent (Rs. 50 crores) was allocated under IEDSS. The amount allocated for this scheme has declined from 60 Cr in 2009-10 to 50 Cr in 2013-14. Since the scheme has been subsumed under RMSA, it does not have a separate funds allocation from 2014-15.

Scarcity of institutions offering teacher training in special areas and lack of special educators further raises an issue of providing effective training and support to teachers and children with special needs under the IEDSS.[52]

***Vocational of Secondary and Higher Secondary Education***

**Objectives and interventions**

- To enhance youth employability, reduce the mismatch between demand and supply of skilled manpower and provide an alternative for the non-academically inclined.

Intervention

Introduction of vocational education in schools, capacity building of vocational education teachers/skill trainers, development of competency based curriculum and teaching learning material, development of management information system for monitoring and evaluation, incentivizing government aided and private recognized unaided schools and taking up innovative programs under vocational education.

**Target**

- To provide financial assistance to government schools for introduction of vocational education from Class IX onwards during 12$^{th}$ Plan period

**Progress under this scheme**

Till date the scheme has approved 3654 government schools in 31 States/UTs covering 365 thousand students across 16 sectors including - Agriculture, Apparel, Automobile, Beauty and Wellness, Banking/Financial Services and Insurance, Construction, Health Care, IT & ITeS,

[52] Working group report on Secondary and Vocational education, Twelfth Five year plan

Logistics, Media and Entertainment, Multi Skill Physical Education and Sports, Retail, Security, Telecom, Travel and Tourism.

The funds allocated under this scheme in the year 2013-14 constituted a paltry 0.6 per cent (Rs. 65.2 crores) of the total revised estimate for secondary education.

The main problems identified by stakeholders are: the lack of regular teachers and their training/retraining, insufficient financial allocation, inflexible duration and delivery of courses, out-dated recruitment rules, poor linkages with industry, absence of separate management structures and absence of long-term commitment from the central government and inadequate monitoring.

***6000 Model School scheme***

The state sector component for setting up of model schools in economically backward blocks (EBBs) through State/UT Governments is being implemented from 2009-10. The implementation of the Public-Private Partnership (PPP) component for setting up of model schools was initiated from 2012-13.

**Objectives and intervention**

- To have at least one quality secondary school in every block to function as a pacesetting institution and provide support to other secondary schools in the area (mostly rural) and address issues of contextual curriculum and pedagogic practices for secondary learners.

Intervention

A model school would have infrastructure and facilities comparable with the Kendriya Vidyalayas. The schools will have upper primary to higher secondary classes or secondary and higher secondary classes; 3,500 model schools will be set up in economically backward regions and will be managed by state governments; and 2,500 model schools will be established in public-private mode in non-economically backward areas. The state governments will decide the medium of instruction with emphasis on spoken English as part of the curriculum.

**Target**

- 3,500 model schools to be set up in economically backward regions that will be managed by state governments

**Progress of the scheme**

Till date, 71.1 percent (2490) of total schools targeted are approved in Economically Backward Blocks (EBBS) and 2329 schools have been sanctioned. There are 519 blocks where the construction of model schools has been completed.[53]

In 2013-14, the amount allocated under this scheme was 9.92 per cent (Rs. 994.50 crores) of the total revised estimate for secondary education. The funds allocated under this scheme have more than doubled over a period of four years from Rs. 280 crores in 2009-10 to Rs. 994.5 crores in 2013-14.

The working group on the twelfth five-year plan mentioned land procurement as a deterrent in the construction of model schools.

[53] Status of construction of Model schools, 6000 Model school scheme, MHRD

***National Means-cum-Merit Scholarship***

This centrally sponsored scheme was launched in May, 2008.

**Objectives and intervention**

- To award scholarships to meritorious students of economically weaker sections to arrest their drop out at class VIII and encourage them to continue to secondary education

Intervention

Scholarship of Rs.6000/- per year (Rs.500/- per month) per student is awarded to selected students every year for study in classes IX to XII in government, government aided and local body schools. There is a quota of scholarships for different states/UTs. Students whose parental income from all sources is not more than Rs.1,50,000/- per year are eligible for the scholarship**.**

**Financial status**

In 2013-14, 0.69 per cent of total revised estimate for secondary education was allocated to this scheme. No allocations were made under this scheme for the year 2014-15 and 2015-16.

***National scheme for Incentives to girls for secondary education***

This centrally sponsored scheme was launched in May, 2008.

**Objectives and interventions**

- To reduce the dropout rates of girls after VIII grade and to encourage them to continue secondary education especially those belonging to SC/ST communities.

Intervention

A sum of Rs. 3000/- is deposited in the name of the unmarried eligible girl as a fixed deposit on enrolment in class IX. The beneficiaries are entitled to withdraw it along with interest on attaining 18 years of age and producing X class passing certificate.

***Financial Assistance for Appointment of language teacher***

**Objectives and interventions**

- To encourage usage of Hindi, Urdu and one Modern Indian language other than English and fulfill the requirement of language teachers in government schools

Intervention

The scheme provides financial assistance to appoint Hindi teachers in Hindi-speaking states; Urdu teachers in minority predominant districts and Modern Indian Language teachers in schools of Hindi speaking states that demand them.

**Financial status**

In 2013-14, 1.03 percent (Rs. 103crores) of the total secondary level revised estimate was allocated to this scheme. No allocation has been made under this scheme for the year 2014-15 and 2015-16.

***Adolescent Education Programme (AEP)***

The Adolescence Education Programme (AEP) is coordinated by the National Council of Educational Research and Training (NCERT) in partnership with the Ministry of Human Resource Development (MHRD) and United Nations Population Fund (UNFPA). This programme is a major initiative within the larger Quality Improvement in Schools Scheme of MHRD.

**Objectives and interventions**

- To equip adolescents to make healthy choices, give them outlets for reinforcing positive behaviors and strengthen their life skills so they can grow up healthy to be able to cope with challenges and make the most of opportunities

Intervention

Life skills and other adolescent concerns are integrated in National Institute of Open Schooling curriculum at the secondary level. In addition, life shills based education through interactive methodologies is transacted to students through a cascade system where a master trainer orients nodal teachers and these teachers further teach the students at secondary level. The intervention also includes providing guidance and counseling to adolescents on their physical development and on the prevention of HIV/AIDS and substance/drug abuse.

***Autonomous body: Kendriya Vidyalaya (KV)***

**Objectives and interventions**

- To provide uninterrupted education to the wards of transferable central government employees

Intervention

All KVs have common textbooks and bilingual medium of instructions. The quality of teaching is kept reasonably high by an appropriate teacher-pupil ratio. No tuition fee for boys' upto Class VIII, girls upto Class XII, SC/ST students and children of KVs employees.

**Progress**

In all, 20 central schools were functional during the academic session 1963-64. This number has now gone upto 1102 including 3 abroad (Kathmandu, Moscow and Tehran) as on 31.10.2014. Out of these 103 KVs are functioning in Northeast and 64 KVs are running in double shift.[54] According to the MHRD Annual Report, KVs have been consistently performing well as far as results of students are concerned. After RMSA, KVs receive the largest proportion of total funds allocated to secondary education.

[54] Annual Report (Part I-2014-15), Statistics, MHRD.

***Autonomous body: The Jawahar Navodaya Vidyalayas (JNVs)***

**Objectives and interventions**

- To enable talented students from rural areas to progress at a faster pace by providing good quality education irrespective of their capacity to pay for it.

Intervention

One Jawahar Navodaya Vidyalaya is to be established in each district. Each JNV is supposed to have a full-fledged campus with sufficient buildings for classrooms, dormitories, staff-quarters, playground, library and lab.

**Progress**

JNVs have been sanctioned in 578 districts till date. In addition, 10 JNVs have been sanctioned in the districts with large SC and ST population. JNVs have been receiving the largest proportion of total funds allocated to secondary education after RMSA and KVs.

***Autonomous body: National Institute of Open School***

**Objectives and interventions**

- Providing relevant, continuing and holistic education up to pre-degree level through Open and Distance Learning Systems and contributing to universalization of secondary education

Intervention

The National Institute of Open Schooling (NIOS) provides opportunities to interested learners by making available secondary, vocational and life skill courses/programmes of study through open and distance learning (ODL) mode.

**Progress**

NIOS has a current enrolment of about 2.71 million students at secondary, senior secondary and vocational levels which makes it the largest open schooling system in the world. At present, about 237,000 students are enrolled at the secondary level.[55]

***Ministry of Minority Affair: Pre-Matric Scholarship scheme***

**Objectives and interventions**

- To encourage parents from minority communities to send their school going children to school, lighten their financial burden on school education and sustain their efforts to support their children to complete school education

Intervention

A scholarship is awarded for studies in a government or private school from I to X grade to minority students who have secured not less than 50% marks in the previous final examination and

[55] http://www.nos.org/media/documents/admprofile20314.pdf

annual income of their parents/guardian from all sources does not exceed Rs. 100,000 per year.[56] While the target was 30 lakh students in 2014-15, an overwhelming 74 lakh have received a scholarship under this scheme.

### A.3 Secondary Education: Issues and Challenges

In the backdrop of preceding review of schemes relating to secondary education, this section discussed some issues that need to be urgently addressed:

***Multiplicity of Education Boards and examinations***

The curriculum and examination set-up in secondary education is fairly complex, with three National Boards and 34 State and Union Territory Boards. The multiplicity of boards makes comparability of the learning outcomes difficult.

***Obsolete curriculum and learning material***

The irrelevant secondary education curricula with abstract, fact-centered and decontextualized narrative knowledge has resulted in high dropout and high failure rates among secondary school students.[57] The textbook content and presentation differ among different Education Boards. The State Board textbooks are examination based and emphasize rote learning over conceptual understanding. The quality of the Central Board curricula and textbooks is considered to be better, though some would argue not that much so. The National Curriculum Framework (NCF), 2005, has tried to introduce some uniformity by formulating guidelines for secondary education across the country. However, the NCF remains a document with most state curricula not being in alignment.

***Lack of integrated upper primary and secondary schools***

One of the reasons for drop out after VIII grade is the lack of integrated upper primary and secondary schools. Schools especially in rural area offer education up to VIII grade. Children have to change schools for secondary education, and a secondary school may not be available within a reasonable distance or children may have to go to a private school requiring additional expenditure. This can act as a barrier to children continuing their education post middle school. Only 29 percent of upper primary schools have an integrated secondary school. The rest of the upper primary schools (71 percent) do not have integrated secondary school. To make the smoother transition from upper primary to secondary and to bring down the dropout rates post upper primary education, integrated schooling is the need of time.

**Table A.4: Integrated secondary schools (2014- 15)**

| Particulars | Number | Percentage |
|---|---|---|
| Only Upper Primary | 425094 | 71.01 |
| Upper Primary with Secondary | 173568 | 28.99 |
| Total | 598662 | 100 |

Source: Calculated from National Secondary Education Report Card (2014-15) & National Elementary Education Report Card (2014-15), U-DISE

[56] http://www.minorityaffairs.gov.in/sites/upload_files/moma/files/pre-matric14-15.pdf, Ministry of Minority Affairs

[57] Document of The World Bank (2009), "Secondary Education in India: Universalizing Opportunity"

The World Bank Report on 'Secondary education in India (2009)' projects the increase in absolute demand for secondary education between 2007-08 and 2017-18 of 17 million students per year. With improving retention and transition rate at elementary education the projected demand for secondary education will be even higher. The paucity of secondary schools as against the elementary schools in absorbing the increased demand for secondary education is therefore a major concern.

***Sharp fall in government schools post elementary education***

While the government schools dominate the elementary schooling scenario, the public provisioning declines drastically post elementary stage. The unaffordability of private secondary education is also one of the reason that is impedes universal access at secondary stage.

***Infrastructural Facilities***

Infrastructural facilities also determine the school enrolment, attendance and dropout. Absence of a toilet facility poses great problems, especially for girls. However, availability of facilities is not sufficient – they should also be usable. About 79 per cent of upper primary and 84 per cent of secondary schools have usable urinals. Similarly, drinking water facility is available in 86 per cent of upper primary schools and 91 per cent of secondary schools.[58] The secondary schools are better equipped with toilet and drinking water facility than upper primary schools. However, the fact that there are schools without these basic facilities both at upper primary and secondary level is a matter of concern.

The role of electricity in provision of lighting and fans is prominent as it has positive impact on teacher's attitude towards work. This enables teacher to teach for longer period improve her performance and attendance and even the children learn better. However, only 51.74 per cent of elementary schools in India have electricity facility. The statistics for number of schools having electricity in Bihar is appalling. Only 8.08 per cent schools in Bihar have electricity facility at elementary level.[59] Secondary schools are in better position with 86.25 per cent of schools having electricity facility.

Absence of these basic infrastructural facilities translates into dropping out of students especially girls. This calls in for immediate attention to universalise the provision of these facilities. Only the availability of infrastructure input is not enough, the way in which these inputs are arranged in schools along with classroom organisation determine the access to schooling.

***Teachers***

Teachers play a key role in determining child's interest or disinterest in school education. Availability of well trained and qualified teachers is necessary for quality education.

Pupil Teacher Ratio (PTR) is not just a number, but is a measure that would lead to better learning outcomes for the child and while working towards reducing the PTR, the answer is not to fill the schools with under-qualified and contractual teachers.[60] Exactly this is the reason for RTE covering both the aspects (a) maintenance of a relatively low PTR and (b) the provision of adequately trained and qualified teachers. According to U-DISE, about 15.35 per cent of schools have PTR greater than 35 at upper primary level. In Madhya Pradesh, Uttar Pradesh and West Bengal more than 30 per cent schools have PTR above 35.

[58] Eighth All India School Education Survey (2009), NCERT
[59] Elementary Education in In India: Towards UEE (2013-14), U-DISE and Secondary Education in India: Towards Universalisation (2013-14), U-DISE
[60] Azim Premji Foundation (2014), "Pupil Teacher Ratio in School and their Implications"

Teachers are professionally qualified which implies that they have the requisite qualification but commitment seems to be lacking. According to a study by NEUPA, children, who had dropped out, perceived teachers to be less interested in teaching in the classroom, preferring instead, taking private tuitions. Apathy of the teachers makes children disengaged from school activities and finally pushing them out of school.[61]

***Dearth of teachers with core subject specialization***

Meeting Pupil Teacher Ratio (PTR) norms is not enough. It is essential that at least one teacher is available for each of the five core subjects along with meeting PTR norm. The 6th Joint Review Mission of RMSA points out the deficit of teachers specialized in core subjects with less than one quarter of schools having at least one teacher in all five core subjects. The report further states that about 40 per cent of schools in India do not have a Mathematics, a Social Studies or a Language teacher (or are lacking two or more of them) and about one third of the schools do not have a Science teacher. Shortage of teachers thus manifests itself into teachers teaching more than one subject outside the purview of their specialisation and teaching multiple grades.

***Irrelevance of teacher training to practice***

There is wide gap between number of trainings sanctioned and the number of trainings completed. The utilisation rate for in-service training funds was below 40 per cent between 2011-12 and 2013-14. In 2014-15, about 74 per cent of funds allocated for in-service teacher training were utilised.

**Figure A.2: In-service training: Sanctioned and Completed**

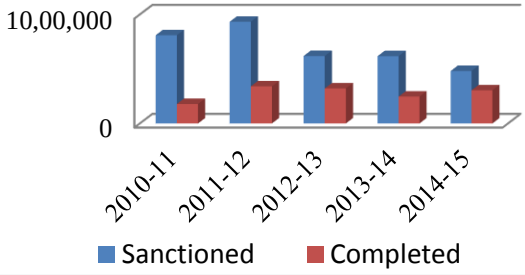
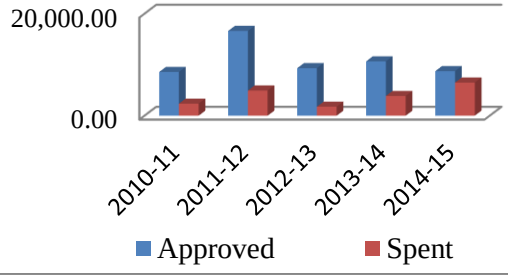



**Figure A.3: Fund Utilisation for In-service teacher training**




Source: 6th Joint Review Mission, Aide Memoire, rmsaindia.org

The relevance and content of teacher training, however, remains a point of concern. The RMSA JRMs over the years have emphasized the inapplicability of the training content and practice in classroom and lack of attention given to integrating topics such as ICT, life skills, inclusive education, gender sensitivity and hands on activity in the training content of pedagogical and subject training.

***Little or no data on learning outcomes***

As was the case in primary education ten years ago, there is little data available on learning outcomes in the post primary grades. As a result, the entire education discourse as well as government policies and targets remain in terms of enrollment and access. The government's National Achievement Survey (NAS) assesses children in grades III, VIII and X and that too not on an annual basis. Further, consecutive rounds of NAS are not comparable. Timely availability and comparability of data over time is essential if it is to feed back into actual interventions in the classroom and teacher training programs.

[61] NUEPA (2011), "Dropouts in Secondary Education: A study of children living in slums of Delhi"

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# X. Appendix

## Chapter V

**Table A.5.1: Teacher type, by age and district**

| Teacher Type | Nalanda | | | | Satara | | | |
|---|---|---|---|---|---|---|---|---|
| | 21 to 30 | 31 to 40 | Above 40 | Total | 21 to 30 | 31 to 40 | Above 40 | Total |
| Head Master | 0 | 1.3 | 9.4 | 5.8 | 2.3 | 2.5 | 11.9 | 8.3 |
| Regular Teacher | 5.7 | 10.1 | 60.6 | 39.1 | 76.7 | 88.3 | 86.6 | 86.1 |
| Para-Teacher | 94.3 | 88.6 | 30 | 55.1 | 20.9 | 9.2 | 1.1 | 5.4 |
| CRC | 0 | 0 | 0 | 0 | 0 | 0 | 0.4 | 0.2 |
| Total | 35 | 79 | 160 | 274 | 43 | 120 | 261 | 424 |

**Table A.5.2: Training details in percentage, by district**

| | Nalanda | Satara |
|---|---|---|
| No. of trainings attended in 2013-14 | | |
| None | 80.81 | 50.13 |
| 1—5 | 18.08 | 49.36 |
| 6—10 | 0.37 | 0 |
| 10 and above | 0.74 | 0.51 |
| Total Teachers | 271 | 393 |
| No. of trainings attended in 2014-15 | | |
| None | 76.38 | 54.86 |
| 1—5 | 22.88 | 45.14 |
| 6—10 | 0.37 | 0 |
| 10 and above | 0.37 | 0 |
| Total Teachers | 271 | 381 |
| Learnt in training | | |
| Attended training in last two school years? | 29.9 | 52.1 |
| Learnt to do administrative work better | 70.5 | 80.8 |
| Learnt some teaching methods (Instructional knowledge) | 97.5 | 97.1 |
| Learnt about policy in India or in MH/BH | 67.5 | 87.9 |
| Learnt some subject knowledge (Content knowledge) | 78.5 | 71.6 |
| Learnt things other than specified | 8.9 | 27.8 |
| Expectations from training | | |
| Content knowledge in specific area | 73.7 | 75.3 |
| Teaching methods in specific subjects | 80.7 | 79.4 |
| Multi-grade teaching techniques | 74.5 | 60.6 |
| Classroom management techniques | 79.2 | 84.3 |
| How to interact with parents and communities | 73.7 | 83.8 |
| How to evaluate children's learning | 82.1 | 87.9 |
| Education policy in India and in study states | 71.9 | 83.3 |
| Other | 15.2 | 31.5 |

**Table A.5.3: Subjects taught a day preceding the survey, by district**

| Subjects taught a day before survey | Nalanda | Satara |
|---|---|---|
| English | 43.07 | 27.7 |
| Hindi/ Marathi | 63.5 | 27.45 |
| Math | 52 | 38.54 |
| Science | 49.27 | 38.78 |
| History | 30.66 | 39.66 |
| Geography | 33.21 | 36.5 |
| Civics | 30.66 | 17.73 |
| Other | 24.81 | 42.14 |

**Table A.5.4: Number of subjects taught on the day preceding the survey, by district**

| Number of subjects taught a day before the survey | Nalanda | Satara |
|---|---|---|
| No subject taught | 0 | 4.71 |
| Single subject taught | 14.23 | 20.47 |
| Two subjects taught | 24.45 | 28.47 |
| Three to five subject | 49.64 | 41.18 |
| 6 or more subjects ta | 11.68 | 5.18 |
| Total | 274 | 425 |

**Table A.5.5: Combination of subjects taught on the day preceding the survey, by district**

| Combination of subjects taught a day before the survey | Nalanda | Satara |
|---|---|---|
| Language/English and math | 39.78 | 10.59 |
| Language/English and science | 39.42 | 11.06 |
| Social studies and math | 24.82 | 18.59 |
| Social studies and science | 27.01 | 18.52 |
| Total | 274 | 425 |

## Chapter VI

**Table A.6.1: Regression Results with scores in language, math, science and English as outcome variables**

| | Language scores | | Math scores | | Science scores | | English scores | |
|---|---|---|---|---|---|---|---|---|
| | State level FE^ | School level FE | State level FE^ | School level FE | State level FE^ | School level FE | State level FE^ | School level FE |
| **Individual characteristics** | | | | | | | | |
| Age | 0.142 | 0.231 | 0.293 | 0.286 | 0.142 | 0.315* | 0.0304 | 0.178 |
| | (0.270) | (0.249) | (0.186) | (0.233) | (0.171) | (0.178) | (0.168) | (0.232) |
| Gender (Reference category: Boys) | 2.467*** | 2.623*** | -3.173*** | -2.986*** | -0.994 | -1.057** | 0.134 | 0.146 |
| | (0.818) | (0.730) | (0.812) | (0.683) | (0.668) | (0.527) | (0.908) | (0.687) |
| **Enrolment characteristics** | | | | | | | | |
| Class 8 in 2014 | 4.560*** | 4.359*** | 3.503*** | 3.280*** | 3.944*** | 3.664*** | 3.200*** | 2.738*** |
| | (1.044) | (0.959) | (0.782) | (0.887) | (0.783) | (0.688) | (0.872) | (0.899) |
| Class 9 in 2014 | 7.014*** | 7.354*** | 6.419*** | 6.753*** | 5.880*** | 5.612*** | 3.941*** | 4.204*** |
| | (1.069) | (1.110) | (1.092) | (1.046) | (0.768) | (0.799) | (0.924) | (1.044) |
| Ever been double enrolled (Reference: Never double enrolled) | 1.537 | 4.318 | -0.282 | 2.261 | -0.628 | 2.563 | 3.535 | 5.956** |
| | (2.674) | (2.947) | (3.030) | (2.739) | (3.000) | (2.138) | (3.378) | (2.840) |
| Changed school between 2013 and 2014 (Reference: In same school) | -0.0369 | 0.673 | 2.001 | 1.746 | -0.187 | -0.256 | 0.516 | 0.888 |
| | (1.191) | (1.284) | (1.209) | (1.182) | (0.881) | (0.922) | (1.034) | (1.199) |
| **Household characteristics** | | | | | | | | |
| *Caste* (Reference: General caste) | | | | | | | | |
| SC | -2.691** | -1.944 | -4.123*** | -4.665*** | -1.786* | -2.023* | -3.453** | -1.725 |
| | (1.179) | (1.416) | (1.512) | (1.339) | (0.970) | (1.033) | (1.382) | (1.349) |
| ST | 0.788 | 2.733 | 2.457 | 2.938 | -0.463 | 0.0696 | -2.249 | -0.512 |
| | (2.935) | (2.949) | (3.012) | (2.821) | (2.431) | (2.065) | (2.781) | (2.726) |
| OBC | 1.452 | 1.879 | 3.524*** | 2.787** | 1.228* | 1.267 | -0.136 | 1.630 |
| | (0.998) | (1.175) | (1.081) | (1.118) | (0.713) | (0.846) | (1.110) | (1.098) |
| EBC | -0.489 | 0.205 | 1.564 | 0.555 | -0.114 | -0.613 | -1.652 | 0.108 |
| | (1.220) | (1.351) | (1.275) | (1.277) | (0.888) | (0.969) | (1.299) | (1.258) |
| Other | 1.322 | 2.022 | 1.624 | -0.166 | 1.306 | 0.669 | 1.841 | 1.699 |
| | (1.550) | (1.657) | (1.864) | (1.508) | (0.987) | (1.192) | (1.730) | (1.547) |
| Muslims | -5.975*** | -5.349** | -5.370* | -4.656** | -2.982* | -3.147* | -0.0507 | 0.436 |
| | (2.174) | (2.232) | (2.709) | (2.056) | (1.550) | (1.639) | (2.227) | (2.092) |

**Table A.6.1: Regression Results with scores in language, math, science and English as outcome variables (contd.)**

^ Standard errors are clustered at the village level.

| | Language scores | | Math scores | | Science scores | | English scores | |
|---|---|---|---|---|---|---|---|---|
| | State level FE^ | School level FE | State level FE^ | School level FE | State level FE^ | School level FE | State level FE^ | School level FE |
| **Household characteristics** | | | | | | | | |
| Affluence (Reference category: Poorest) | | | | | | | | |
| Medium | 1.709 (1.238) | 2.182* (1.127) | 0.577 (0.956) | 1.413 (1.014) | 0.356 (0.725) | 0.355 (0.808) | 1.342 (0.975) | 1.335 (1.054) |
| Well- off | 4.832*** (1.462) | 4.536*** (1.448) | 4.016*** (1.220) | 3.961*** (1.352) | 1.512 (0.970) | 1.251 (1.037) | 5.466*** (1.493) | 3.406** (1.351) |
| Mother's education | 0.604*** (0.165) | 0.495*** (0.104) | 0.583*** (0.161) | 0.500*** (0.0971) | 0.379*** (0.113) | 0.308*** (0.0743) | 0.578*** (0.159) | 0.567*** (0.0966) |
| Father's education | 0.681*** (0.138) | 0.681*** (0.0981) | 0.475*** (0.110) | 0.402*** (0.0797) | 0.435*** (0.0884) | 0.396*** (0.0706) | 0.704*** (0.147) | 0.679*** (0.0921) |
| Home language is different from state vernacular (Reference: Both are same) | -3.079 (2.998) | 2.043 (4.282) | -6.003 (3.995) | -1.581 (3.893) | 1.509 (2.739) | 5.447* (3.120) | -0.109 (2.867) | 2.516 (4.040) |
| Home language is different from state vernacular (Reference: Both are same) | -1.884** (0.855) | -2.165** (0.846) | -1.289 (1.094) | -1.284 (0.799) | -1.225* (0.668) | -1.255** (0.606) | -1.844** (0.753) | -1.763** (0.790) |
| **Tuition status** | | | | | | | | |
| Attends tuition classes (Reference: Does not attend tuition classes) | -0.448 (1.094) | -0.771 (1.166) | 5.358*** (1.112) | 5.551*** (0.880) | 3.760*** (0.868) | 3.648*** (0.738) | 3.573*** (1.161) | 2.820*** (0.897) |
| **Management type of school** | | | | | | | | |
| Management type- Private (Reference: Government) | 0.255 (1.432) | 1.754 (1.423) | -0.151 (1.553) | 3.057** (1.345) | 1.745 (1.124) | 1.710* (1.019) | 1.734 (1.129) | 4.736*** (1.324) |
| N | 2,985 | 2,985 | 3,126 | 3,126 | 2,907 | 2,907 | 2,879 | 2,879 |

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0

## Annexure

### Table A.A.1: Outlay Approved under RMSA

| Head | 2013-14 | | 2014-15 | | 2015-16 | |
|---|---|---|---|---|---|---|
| | Outlay | % | Outlay | % | Outlay | % |
| Civil works | 129693 | 29% | 125603 | 27% | 200024 | 31% |
| Teacher Salary | 209252 | 46% | 200020 | 43% | 231792 | 36% |
| Quality | 75413 | 17% | 92026 | 20% | 144468 | 22% |
| Equity | 23102 | 5% | 27751 | 6% | 45569 | 7% |
| MMER | 15069 | 3% | 15626 | 3% | 23283 | 4% |
| Total | 452529 | | 461026 | | 645136 | |

Source: RMSA at Glance, rmsaindia.org