Young Lives School Survey, 2016–17:
Evidence from India

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Young Lives

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Contents

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Acknowledgements

Summary

This country report provides an overview of the Young Lives secondary school effectiveness study conducted in India (Andhra Pradesh and Telangana) in 2016-17 with around 9,000 children in Class 9. The survey was designed to allow analysis of what shapes children's learning and progression over a school year, and this paper gives a descriptive report of some of the main areas of data.

This secondary school study examined school effectiveness through three outcome measures: Class 9 students' performance in maths; functional English; and transferable skills. Student performance in maths and functional English was assessed using repeated measures, with linked cognitive tests administered at the beginning and end of Class 9; this allowed students' progress over the course of one year of secondary schooling to be considered in relation to their background, individual, class, teacher and school factors. This survey design has generated rich evidence about school and class effectiveness, and the drivers of learning within schools that children within the 20 Young Lives sites in Andhra Pradesh and Telangana could access.

1. Background

1.1 Survey design

1.1.1 Young Lives

Young Lives is an international study of childhood poverty that has followed the lives of 12,000 children in Ethiopia, India (Andhra Pradesh and Telangana), Peru and Vietnam since 2002. Young Lives follows two groups of children in each country – the 'Younger Cohort' born in 2001-2, and the 'Older Cohort' born in 1994-95. This allows us to compare the same children at different ages to see how their lives are changing, as well as different children at the same age, to see how communities have changed over time. A sentinel site sampling design is employed in all four countries. The Young Lives sample is not nationally representative; in each country, 20 purposively selected sites were chosen at the beginning of the study to represent national diversity, with a pro-poor bias (Rolleston et al. 2013).

The household survey has been conducted with Young Lives children and their families every three years since 2002, with Round 5 (the latest round) conducted in 2016-17. Child questionnaires, household questionnaires and community questionnaires gather data on household composition, livelihood and assets, household expenditure, child health, access to basic services, and education.

In 2010, a school component was introduced to explore Young Lives children's experiences of schooling and education in depth. Primary school surveys were conducted in India (2010), Peru (2011), Vietnam (2011-12) and Ethiopia (2012-13), and in 2016-17, a further round of Young Lives school surveys was conducted at upper primary level (in Ethiopia) and secondary level (in India, Peru and Vietnam). This country report focuses on the 2016-17 school survey in India, and presents descriptive statistics from two rounds of data collection with approximately 8,355 students in 205 schools. The report presents findings for Andhra Pradesh and Telangana together[1], with tables and graphs disaggregated by Young Lives site, district or school type as appropriate.[2]

1.1.2 Young Lives school survey in India, 2016-17

Following the Young Lives primary school survey in India (conducted in 2010), Young Lives conducted a secondary school effectiveness study in India in 2016-17. This study examines school effectiveness through three outcome measures: Class 9 students' performance in maths; functional English; and transferable skills. Student performance in maths and functional English was assessed using repeated measures, with linked cognitive tests administered at the beginning and end of Class 9 (Wave 1 and Wave 2 of data collection respectively). This allows students' progress over the course of one year of secondary schooling to be considered in relation to their background, individual, class, teacher and school factors.

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1   The undivided state of Andhra Pradesh was bifurcated in 2014 into Andhra Pradesh and Telangana. Young Lives collects data from sites in seven districts: four in Andhra Pradesh and three in Telangana.

2   See Appendices for disaggregated tables for each state.

The primary school survey in India focused upon Young Lives Younger Cohort children, tracking them to their schools and classrooms to understand more about their educational experiences and achievement. The secondary school survey in 2016-17, which is the focus of this report, collected data from children in the same school grade as many of the Younger Cohort within a sample of schools in sites[3] in Andhra Pradesh (henceforth AP) and Telangana where the Young Lives study takes place.[4] The survey design generates rich evidence about school and class effectiveness and the drivers of learning within schools which the Young Lives cohort could have access to. The study focuses on Class 9, the penultimate year of secondary education.

Priority areas for secondary education policy and practice in India were identified in consultation with key stakeholders at national and state level, including the Ministry of Human Resource Development (MHRD), AP and Telangana Ministries of Education, World Bank, DFID-India, Azim Premji Foundation, Pratham, as well as through discussions with teachers in AP and Telangana. These consultations guided the development of the main research questions for the survey, which are:

1. How does student learning differ between different types of school?

2. How does teacher motivation, attitude and practice impact on student learning?

3. How does school size and number of teachers (subject-wise) impact on school efficiency and student learning?

4. How do learning and progress differ between students with different mediums of instruction?

5. What are some of the factors (in school and outside school) to which differences in students' functional English skills can be attributed?

6. What models of school leadership and governance are in place to hold teachers and schools accountable, and how do these relate to differences in school effectiveness?

1.2   Sampling strategy

The design of the school survey in 2016-17 focused upon the quality and effectiveness of education in AP and Telangana. The ability to look at this within different types of schools was of particular interest because of the diverse educational context within India. It was therefore important to use a sampling strategy which ensured that each school type of interest was included in sufficient numbers to allow the effects of different school types to be fully explored.

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3   In India, Young Lives sites are at *mandal* level.

4   See section 1.2 for further details on the sample.

For this reason, a sample design stratified by the following four school types was used: State Government; Private Unaided; Private Aided; and Tribal/Social Welfare.[5] These school types emerged as categories of interest in meetings with stakeholders and policymakers at state and national level. DISE/SEMIS 2014-15 data (NUEPA 2015) reveal that schools in these four categories make up 99 per cent of the total schools offering secondary education in the 20 Young Lives sites.

The final sample design took into consideration the total number of schools offering education at Class 9 level in the 20 sites (approximately 800, as recorded in DISE-SEMIS 2014-15) and the number of schools attended by Young Lives Younger Cohort children in 2015-16 (approximately 530 different schools). These numbers indicated that it would not be possible to adopt a sampling design which surveyed either all schools attended by Young Lives children, or all schools in the sites. The distribution of Young Lives children across multiple grades and schools (see James and Woodhead 2014) also made it difficult to prioritise their inclusion in the sample without visiting a very large number of schools. As a result, the decision was made to focus on a representative sample of schools located within the sites in which the Young Lives children live. This allows the survey to provide insight into the different types of schools which people within this site (including the Young Lives households) could choose between. The final sample includes approximately 60 Young Lives Younger Cohort children in Class 9.

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5   State Government schools are managed by the state government and are wholly state funded. For the purposes of this survey, 'Local Body' schools have also been included in the State Government category. Local Body schools are managed by local governing bodies such as municipalities or district boards.

Private Unaided schools are managed by a trust, private organisation or individual, and do not receive any regular financing from local, state or government bodies. They range from elite international schools to low-fee private schools.

Private Aided schools are managed by a trust, private organisation or individual, and are financed through a grant from the local, state or central government. Some also charge tuition fees. In Private Aided schools, up to 95 per cent of funding can come through state grants – this includes teacher salaries and recurrent non-teacher spending. Private Aided schools follow government regulations on curriculum, timetables, school hours and teacher recruitment.

Tribal/Social Welfare schools provide residential schooling for children from tribal or minority groups. They are usually selective schools. They are centrally funded but are managed by the state government. For more details on different types of schools in India, see Aggarwal and Thakur (2003).

Map 1.   *Young Lives study sites in Andhra Pradesh and Telangana*

Young Lives study sites in Andhra Pradesh and Telangana

To ensure that each site was represented in the sample, sampling was undertaken at site level. Schools were selected within each stratum through a simple random sample in each site, using the DISE-SEMIS 2014-15 school list as the sampling frame.[6] The number of schools sampled in each site was proportional to the total number of schools, using a 'sliding scale'.[7] As they are less prevalent across the sites, Tribal/Social Welfare schools and Private Aided schools were census sampled to ensure sufficient numbers.[8] This sampling strategy maximised the number of different schools from each site, providing data which is representative at the site level. In total, the sample included 212 schools. It was not possible to administer the survey in seven of the sampled schools, leaving a total of 205 schools from

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6   Schools which did not cover Class 9, those which had other types of school management, and those which DISE-SEMIS 2014-15 recorded as having fewer than 15 students enrolled in Class 9 were excluded from the sample.

7   The sliding scale approach was required because of the extent of variation in numbers of schools found between sites. It allowed a smaller proportion of schools to be sampled from sites with a large number of schools, while in sites with fewer schools, a larger proportion was sampled. The smallest proportion of schools sampled was 10 per cent (sites with more than 80 schools) and the largest was 100 per cent (sites with fewer than eight schools).

8   As some school types were census sampled, and others were randomly sampled, data must be weighted in analysis to be representative at the site level. Section 3 has further details on weighting of the data.

which data were collected.[9] This included 85 State Government schools, 55 Private Unaided schools, 29 Private Aided schools, and 36 Tribal/Social Welfare schools.

Within each school, the survey covered all Class 9 students present on the day of the survey visit, along with their maths and English teachers, and the head teacher.

1.3   Test and instrument development

The school survey included three cognitive tests to assess student learning over the course of one school year, along with a range of background data collection instruments to contextualise findings on learning outcomes. These instruments were developed in 2015-16 through a process of item selection, translation and adaptation, alongside qualitative and quantitative pilot testing.

The following sections provide a brief introduction to the cognitive tests administered in the school survey; for more details on the design and development of these tests, see Azubuike et al. (2017) and Iyer and Azubuike (forthcoming).

1.3.1 Cognitive test development

1.3.1.1 Maths

In the 2016-17 school survey, we conceptualise learning quality both in terms of progress on curriculum knowledge *and* students' ability to apply their knowledge and skills in less familiar contexts.[10] This is to reflect the changing priorities of education systems at upper primary and secondary levels. We identified the TIMSS (Trends in International Mathematics and Science Study) Maths Assessment Framework as a useful way of assessing students' mathematical ability in these terms, as it distinguishes between three mathematical cognitive domains:

- Knowing: the facts, concepts and procedures students need to know.
- Applying: the ability of students to apply knowledge and the conceptual understanding to solve problems or answer questions.
- Reasoning: going beyond the solution of routine problems to encompass unfamiliar situations, complex contexts, and multi-step problems (Grønmo et al. 2015: 24).

In addition to these cognitive domains, the maths test is based around mathematical content domains which are appropriate for AP and Telangana, with additional consideration for those domains also found in the curricula in Ethiopia and Vietnam. Eight common content domains were identified in the maths curricula for the survey grades in India, Ethiopia and Vietnam:

- Basic number competency
- Integers, rational numbers, powers and bases
- Fractions, decimals, ratios and percentages
- Area, perimeter, volume and surface area

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9   Reasons for the survey team being unable to survey a sampled school were: no Class 9 students being present on the day of the visit; the survey team being unable to locate the school at the given address; and the school management team refusing permission for the survey to take place.

10 See Iyer and Moore (2017) for a more detailed discussion of the way in which quality learning has been conceptualised in the 2016-17 school surveys.

- Geometry and shapes

- Algebra

- Measurement, charts and graphs

- Reasoning, problem solving, and applications in daily life

Test items were selected from within these domains to reflect the curriculum priorities in each country.

1.3.1.2 Functional English

Functional English language tests were included as part of the 2016-17 school surveys as a reflection of the status of English in India, Ethiopia and Vietnam as a 'transferable skill', with relevance for continuing education, labour market opportunities and social mobility (Graddol 2010). While students' exposure to English varies across the different contexts within the three countries (both within and beyond school), the language is seen as increasingly relevant by policymakers and individuals alike.

The construct assessed in the Young Lives English test is 'functional English', which can be defined as the 'application of […] skills in purposeful contexts and scenarios that reflect real-life situations' (OFQUAL 2011: 10). In this sense, the English test diverges somewhat from the school curriculum. Due to practical and logistical considerations of conducting a large-scale survey, the test is comprised of multiple-choice questions – a limitation which means that it only captures language knowledge and reading skills, which are just one dimension of the functional English construct.

Within the functional English construct, the test focuses on the types of skills which 15 year olds in AP and Telangana may currently use, or may need in the future. The following four skill domains were identified:

- Word identification: identifying simple vocabulary which students are likely to have been exposed to. With particular focus on language relating to their everyday environment and to education, questions relating to this skill are particularly suited to those learners at a lower level.

- Word meaning and contextual vocabulary: identifying the meaning of unfamiliar words through their contextualised use in a sentence, or through identifying a synonym/antonym. Questions in this skill domain are of particular relevance for those who are likely to have greater exposure to English outside school, or those who have a higher level of English.

- Sentence construction and comprehension: completing sentences correctly, using appropriate grammatical concepts, and combining sentences together. Questions relating to this skill can be at a range of levels, but require learners to have some degree of understanding of the meaning of complete sentences.

- Reading and comprehension: reading a range of texts (stories, posters, factual passages) and comprehending both direct facts and implicit inferences from them. Questions relating to this skill can be at a range of levels, but require learners to be able to read and have some understanding of English texts. Questions relating to implicit inferences rather than direct facts require a higher level of English language ability.

1.3.1.3 Transferable skills: problem solving and critical thinking

If the development of foundational skills such as numeracy and literacy is central to the 'first phase' of quality education, then the development of transferable skills can be seen as the 'next phase'. Transferable skills, also referred to as twenty-first century skills, are widely understood to include a range of cognitive and non-cognitive skills that provide young people with 'critically needed tools to be able to succeed in terms of employment, health and personal well-being' (Rankin et al. 2015: 1; World Bank 2014; UNESCO 2016). Such skills are seen as essential to prepare young people for complex life and work environments in the twenty-first century (P21 2015). While the importance of transferable skills at secondary level is emphasised globally and within Young Lives study countries, there is still limited evidence on the development of transferable skills in low and middle-income countries (Rankin et al. 2015).

Problem solving and critical thinking are among several 'higher order' cognitive skills that are seen as desirable outcomes for secondary education (World Bank 2014; UNESCO 2016; Iyer and Azubuike, forthcoming). Within an educational context, problem solving and critical thinking can both be considered as domain-specific skills (as required within specific subjects such as maths and the sciences), or as cross-curricular skills (those which can be developed and applied across domains and within 'real-life' situations) (Kuhn 1999; Scherer and Beckman 2014; Greiff et al. 2013). In the 2016-17 school survey, we examine problem solving and critical thinking as cross-curricular skills rather than domain-specific skills. In light of our interest in problem solving and critical thinking as transferable skills, it is more relevant to consider the potential application of such skills within real-life contexts rather than narrowly within school subjects. We also understand problem solving and critical thinking as separate constructs, according to the following definitions:

Problem solving: 'An individual's capacity to use cognitive processes to resolve real, cross-disciplinary problems where the solution path is not immediately obvious' (Greiff et al. 2013: 74).

Critical thinking: Skills such as inference and evaluation which are applied to ill-structured problems, and for which 'there are no definitive solutions' (Kuhn 1999; Thomas and Lok 2015).

1.3.1.4 Piloting and test development

A total of 120 maths items, 120 English items and 46 transferable skills items were selected for piloting in India. Maths and English items were selected in collaboration with Educational Initiatives[11], using items from their item bank, while transferable skills items were selected from College Work and Readiness Assessment (CWRA+) items[12] (for critical thinking) and publically available PISA items (for problem solving). Items were mapped according to the assessment frameworks described above, and were graded according to complexity, curriculum content, grade level (for the maths tests), approximate Common European

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11 Educational Initiatives conduct large-scale assessments and education programmes throughout India and internationally, working with state and national governments and NGOs. Young Lives worked in partnership with Educational Initiatives on the development of the maths and English tests in the 2016-17 school surveys in India, Ethiopia, and Vietnam.

12 The CWRA+ tests were designed by the Council for Education to assess critical thinking in middle schools in the USA. Items were adapted for use in India.

Framework of References for Languages (CEFR)[13] level (for the English tests) and type of skills assessed (for the transferable skills tests).[14]

Following pilot data collection, test item data were analysed to generate a range of statistics that would aid the item selection process. To assess the reliability and validity of each item and the tests as a whole, analysis of pilot data was conducted using Classical Test Theory (CTT) and Item Response Theory (IRT).[15] The test development process led to the design of two linked multiple-choice 40-item maths tests, two linked multiple-choice 50-item functional English tests, and one multiple-choice 22-item transferable skills test for use in AP and Telangana.[16] As mentioned above, maths and English tests were administered at the beginning and end of the year in order to provide a measure of student progress in these domains; the transferable skills test was administered at the end of the year as a cross-sectional measure of student performance.

1.3.2 Background questionnaires

Three background questionnaires were included as part of the school survey in 2016-17: one for students; one for head teachers; and one for maths and English teachers.

1.3.2.1 Student background questionnaire

The student background questionnaire was completed by all Class 9 students present on the day of the survey. It had two parts, with some questions asked at the beginning of the school year and some asked at the end of the school year. The questionnaire captured data on students' home and family background, educational history and experiences, and life outside school. It also included psychosocial scales to provide a measure of student perceptions of school.

1.3.2.2 Head teacher background questionnaire

The head teacher background questionnaire was completed by the head teacher/principal of each school. It had two parts, with some questions asked at the beginning of the school year and some at the end of the school year. The questionnaire included questions on the head teacher's background, professional training and experience, and role at the school. It also captured data about the school, such as funding, as well as data on leadership, management, and decision making.

1.3.2.3 Teacher background questionnaire

The teacher background questionnaire was completed by all maths teachers and English teachers who teach Class 9. It was completed at the end of the school year. The questionnaire collected data on the teacher's background, professional training and

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13 The CEFR framework details six levels of English language proficiency. Young Lives English test items were graded according to the types of language skills and proficiency they required.

14 See Section 3 for more details on of the piloting procedures for all instruments.

15 See Azubuike et al. (2017) and Iyer and Azubuike (forthcoming) for a more detailed discussion of the process of pilot data analysis and item selection in the maths and English tests and transferable skills test respectively.

16 Piloting of the transferable skills items in India revealed that completing a 22-item test combining problem solving and critical thinking items took students a considerable amount of time (upwards of 1.5 hours in some schools). For practicality, the final test design separated these two tests, with half of the students in each section completing 11 problem solving items, and half of the students completing 11 critical thinking items.

experience, and role at the school. It also included psychosocial scales on areas such as teacher motivation and efficacy.

1.3.3 Other measures

In addition to the background questionnaires, measures of teacher and student psychosocial skills, the classroom instructional environment, and teacher professional knowledge also formed part of the school survey. Most were incorporated within the background questionnaires described above, while items on teacher professional knowledge were administered as a separate questionnaire. Findings from these measures are not presented in this report, but will be explored in subsequent analysis.

1.3.3.1 Student psychosocial scales

The student psychosocial scales formed part of the student background questionnaire which was completed at the end of the school year by all students present. The scales covered a range of constructs selected because of their likely association with students' academic outcomes (see Little and Azubuike 2017). The seven scales included in the survey in India were: significant others; future orientation; low academic self-confidence; effort; personal development; maths subject interest; and English subject interest.

1.3.3.2 Teacher psychosocial scales

The teacher psychosocial scales were incorporated into the teacher questionnaire, and were completed by all maths and English teachers who teach Class 9. The six scales capture data relating to different aspects of teacher attitudes and beliefs, with particular focus on constructs relating to teacher motivation and efficacy as these had been shown to be areas of particular policy interest in India (see Moore and Rossiter, forthcoming). These scales were: well-being; relationship with others in the school; morale and satisfaction within current job; efficacy; equality; and professional commitment.

1.3.3.3 Classroom instructional environment scales

A measure of student perceptions of the classroom instructional environment was included as part of the background questionnaire completed by students at the end of the school year. This measure records students' view of the 'school climate' and 'school instructional environment' (see Moore and Rossiter, forthcoming). Students completed scales twice: once in relation to their regular maths lessons; and once for their regular English lessons.

1.3.3.4 Teacher professional knowledge questionnaire

A measure of maths teacher professional knowledge was included in the school survey. The items included were adapted from the Learning Mathematics for Teaching (LMT) Project and covered three content domains: geometry; numbers, concepts and operations; and patterns, functions and algebra (see Moore and Rossiter, forthcoming). These items were administered to all Class 9 maths teachers as a questionnaire at the end of the school year.

1.4 Scaling and reporting of results

Results from tests in mathematics, English and transferable skills are presented, depending on the purpose, either as 'raw' scores, percentage correct scores or 'interval scaled scores'. This last set of scores are computed using methods based on 'item response theory' (IRT) and are intended to provide a more precise measure of the underlying skill domains which

are being assessed. The approach conceptualises the skill domains as 'latent traits' (for example, mathematics proficiency), which are observed indirectly through response patterns to a set of question items. In brief, IRT models are employed to simultaneously estimate both 'item' and 'person' parameters, where the first describe the characteristics of the test items – including 'item difficulty' – and the second describes the 'ability' of test-takers. 'Item difficulty' describes the probability that the item is answered correctly based on the responses among the sample, while 'person ability' depends on how many and which questions a student answers correctly. Using IRT modelling, we generate interval scaled scores which reflect not only the number of questions answered correctly by a student, but also the difficulty levels of the questions answered correctly. Interval scaled scores may be considered directly comparable estimates of students' levels of the relevant underlying skill (latent trait).

The 'person ability' parameter (latent trait) estimate is transformed onto a scale with mean fixed at 500 and standard deviation fixed at 100. This convention, followed by international assessment studies including PISA and TIMSS, renders the scaled scores readily comparable in standard deviation terms. For example, in respect of two students scoring 500 and 575, it can be immediately appreciated that the difference in scores is 0.75 standard deviations (since one standard deviation is defined as 100 points on the test-score scale). More detail on the technical procedures is provided in Section 3.

2. Survey findings

The survey sample included 205 schools, 317 sections and 519 teachers from across the twenty Young Lives sites, as shown in Tables 1 and 2. In each site, the sample was stratified into four school management types, although every type was not present in each site. This section presents descriptive findings from the survey relating to the background of these schools, teachers, and students.

Table 1. *School and section sample, by site*

District	Number of Young Lives sites	School types					Class 9 sections
		Private Aided schools	Private Unaided schools	State Government schools	Tribal/ Social Welfare schools	Total schools	
West Godavari sites	2	8	5	5	11	29	50
Srikakulam sites	5	1	9	23	17	50	80
Kadapa sites	2	0	2	8	0	10	13
Anantapur sites	4	6	8	17	1	32	54
Karimnagar sites	2	6	9	9	3	27	37
Mahbubnagar sites	4	0	6	19	4	29	39
Hyderabad site	1	8	16	4	0	28	44
Total	**20**	**29**	**55**	**85**	**36**	**205**	**317**

Table 2.   *Head teacher and teacher sample, by site*

District	Head teachers	Class 9 teachers	
		Maths	English
West Godavari sites	29	40	37
Srikakulam sites	50	69	59
Kadapa sites	10	14	11
Anantapur sites	32	47	39
Karimnagar sites	27	25	29
Mahbubnagar sites	29	37	33
Hyderabad site	28	41	38
Total	**205**	**273**	**246**

Data were collected from each school at the beginning of the school year (Wave 1) and the end of the school year (Wave 2).[17] In Wave 1, all Class 9 students who were present were included in the survey, while in Wave 2 only those who were present on the day of the survey visit and who had participated in the Wave 1 survey were included. The attrition rate for students participating in the survey between Wave 1 and Wave 2 was 15 per cent overall, although this varied between sites.

Table 3.   *Student sample and instrument completion, by district and survey wave*

District	Students included in Wave 1 survey *	Students included in Wave 2 survey **
West Godavari sites	1614	1395
Srikakulam sites	2962	2540
Kadapa sites	303	253
Anantapur sites	1660	1360
Karimnagar sites	900	798
Mahbubnagar sites	1169	993
Hyderabad site	1212	1016
Total	**9820**	**8355**

Notes: * Students present on the day of the Wave 1 survey who participated in at least one cognitive test. ** Those students who participated in the survey (at least one cognitive test) at both Wave 1 and Wave 2.

2.1   School characteristics

This section presents descriptive statistics on the 205 schools included in the school survey.[18] Findings are mainly presented by school management type (Table 4) , with some further analysis by district or site where relevant.

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17 In Andhra Pradesh and Telangana the school year runs from June to March. Wave 1 took place in July-August 2016 and Wave 2 took place in February 2017.

18 This school-level analysis does not use weighted data. Findings presented in this section represent only those schools actually sampled for the 2016-17 school survey.

Table 4. *Percentage of schools and students, by school type*

School type	Schools in the sample (%)	Students in the sample (%)
Private Aided	14	14
Private Unaided	27	21
State Government	41	45
Tribal/Social Welfare	18	19
Total	**100**	**100**

Notes: The student data in Table 4 is unweighted to align with the unweighted school data. This means that the percentages here represent the actual proportions of students in the school survey sample. All other analysis of student data in subsequent sections of this report is weighted so as to be representative at the site level.

The schools in the sample were predominantly in rural areas, reflecting the nature of the Young Lives sites from which the sample was drawn. As Table 5 shows, Private Aided and Unaided schools were more prevalent in urban areas, although over a third of Private Unaided schools were in rural areas. Tribal/Social Welfare schools were only found in rural areas.

Table 5. *School locality, by school type*

Locality	Private Aided (%)	Private Unaided (%)	State Government (%)	Tribal/Social Welfare (%)	Sample mean (%)
Rural	7	36	87	100	64
Urban	93	64	13	0	36
Total	**100[19]**	**100**	**100**	**100**	**100**

2.1.1 School size and grades covered

There was a lot of variation in the grades taught by the surveyed schools. State Government schools almost exclusively offered Class 6-10 (the upper primary and lower secondary grades), while Private Unaided schools more commonly offered classes from primary through to lower secondary. The majority of Tribal/Social Welfare schools covered Class 3-10, with a smaller proportion offering Class 5-10 or 5-12.

Table 6. *School grades, by school type*

Grades covered	Private Aided (%)	Private Unaided (%)	State Government (%)	Tribal/Social Welfare (%)	Sample mean (%)
Class 6-10	48	15	95	3	51
KG-Class 10	7	55	0	0	16
Class 1-10	34	27	0	0	12
Class 3-10	0	0	0	58	10
Class 5-10	3	0	4	17	5
Class 5-12	0	0	0	11	2
Other grade combinations	7	4	1	11	4
Total	**100**	**100**	**100**	**100**	**100**

[19] Numbers in all tables in the report have been rounded so may not always sum to exactly 100 per cent.

Small schools were common within the sample, with almost 60 per cent of schools having just one section in Class 9.[20] This was true across all four school types, as shown in Figure 1, although a small proportion of the State Government and Private Aided schools were slightly larger, with more than three sections in Class 9.

There was also considerable variation in section size. Here the variation was mostly found between sites, rather than between school types. As shown in Figure 2, some of the sites in Anantapur, Kadapa and Karimnagar had a mean section size of 30 or fewer students enrolled, while in sites in Srikakulam and Mahbubnagar, the mean section size was around 50-60 students enrolled. It should also be noted that there was also a great deal of variation within sites as well as between them; for example, in site SR1 the mean section size was around 40 students, but within this site section sizes ranged from 11 to 87 students enrolled.

Figure 1.   *Number of sections in Class 9, by school type*
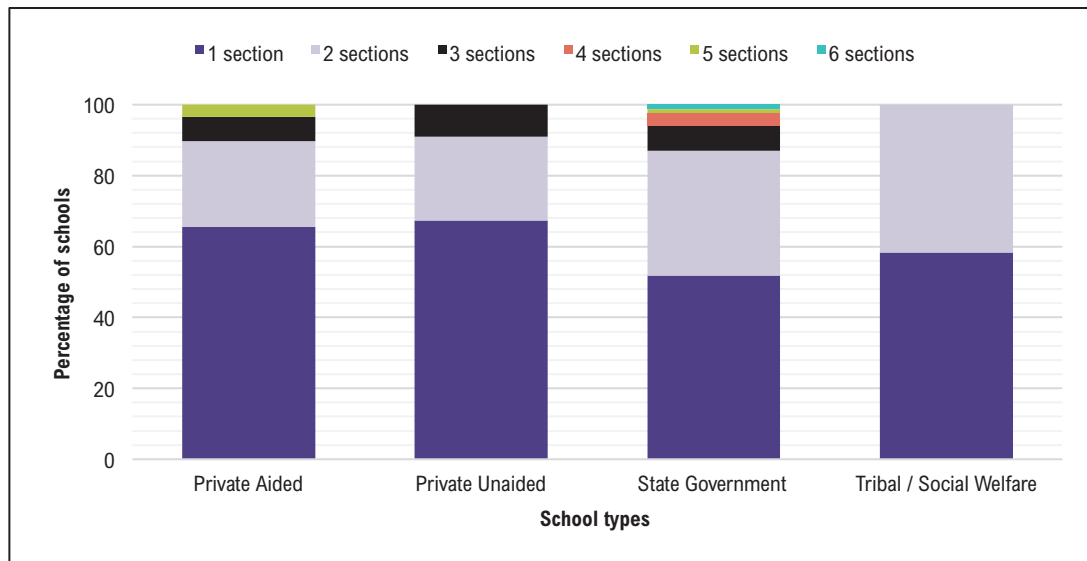
20 This reflects Indian government policy of providing one school within 3 km of every habitation (at primary level) and within 5 km of every habitation (at secondary level). As a result of this policy, many small schools have been established.

Figure 2.   *Mean section size, by site*
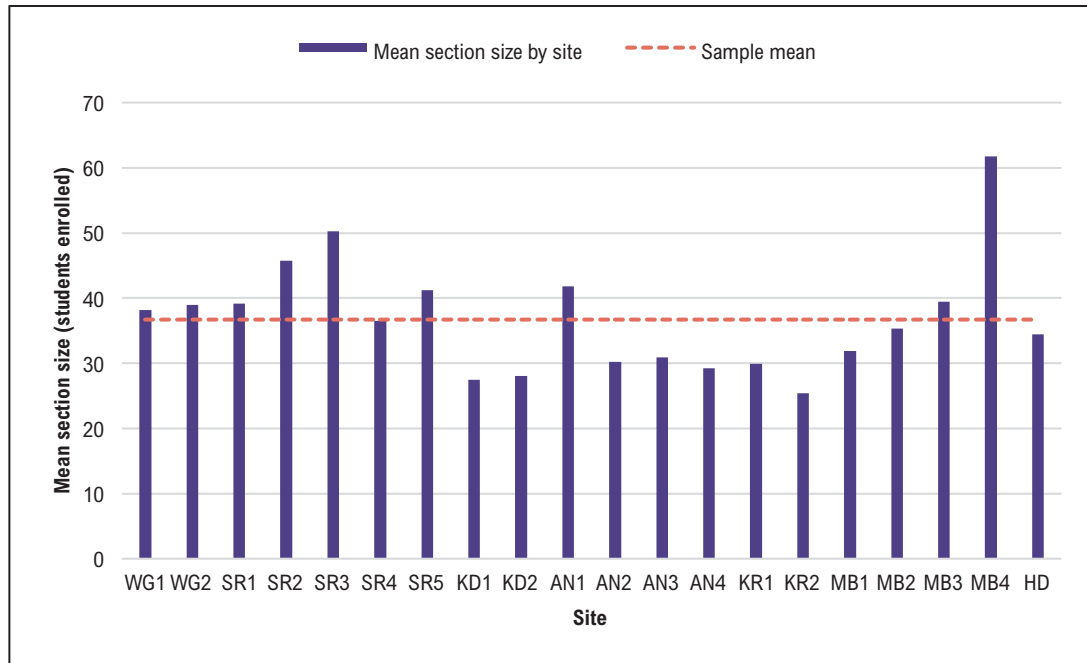
Notes: Mean section size refers to the number of students enrolled in the section at the point when the Wave 1 survey took place. The abbreviations used for the Young Lives sites begin with two initials for the district name and then a number, i.e. WG1 is the first site in West Godavari. See Section 3 for details of the anonymised sites.

2.1.2   School facilities

The sampled schools had similar facilities, for example, almost all had electricity in the school compound and a separate classroom for each Class 9 section. Some form of outside space was common, although less frequently found in Private Unaided schools than in other types. As shown in Table 7, around a quarter of the schools visited were judged to require major repairs, although this did vary considerably by school type.

Table 7.   *Selected school facilities, by school type*

Type of school	% of schools where each Class 9 section has their own classroom	% of schools where teaching was observed taking place in open space *	% of schools where there is some kind of outside space **	% of school compounds with electricity	% of schools with functional internet access	% of schools with at least one functional computer available for student use	% of schools in need of major repairs ***
Private Aided	93	10	90	100	62	62	24
Private Unaided	98	15	64	98	76	80	7
State Government	91	19	87	99	46	60	32
Tribal/Social Welfare	97	0	92	100	61	56	33
Sample mean	**94**	**13**	**82**	**99**	**59**	**65**	**24**

Notes: * These figures collate teaching in open space (no cover), and teaching in open space (partial cover). ** These figures collate schools with outside space which is sufficient for assembly only, and those with sufficient outside space for sports or games. *** Major repairs means that the physical structure of the building is poor enough to affect teaching and learning, e.g. a leaking roof or missing wall. It does not include minor repairs such as painting.

2.1.3 Teaching in schools: medium of instruction and lesson time

There were a range of different mediums of instruction represented in the survey, reflecting the diversity of educational provision in AP and Telangana. The medium of instruction varied by school type, with almost all Private Unaided schools teaching only in English, while over half of the Private Aided and Tribal/Social Welfare schools taught only in Telugu. A large proportion (40 per cent) of the State Government schools offered both Telugu and English medium instruction, with at least one Telugu medium section and one English medium section in Class 9. Just over 2 per cent of the schools taught in Urdu medium; these were located in two sites in Karimnagar and Hyderabad where there is a large Urdu-speaking population.

Table 8.   *School medium of instruction, by school type*

School medium of instruction	Private Aided (%)	Private Unaided (%)	State Government (%)	Tribal/Social Welfare (%)	Sample mean (%)
Telugu only	62	4	48	64	41
English only	24	91	8	36	38
English and Telugu	3	2	40	0	18
Urdu	10	2	1	0	2
Other	0	2	2	0	1
Total	**100**	**100**	**100**	**100**	**100**

A similar amount of time was spent teaching English and Telugu to Class 9 each week across all school types, with Private Unaided schools spending slightly more time on English, and Tribal/Social Welfare schools spending slightly more on Telugu, as shown in Figure 3. There was a more notable difference in time spent teaching maths, with Private Unaided schools spending an average of 60 minutes more per week on maths than other types of school.

Figure 3.   *Mean minutes of lesson time per week, by subject and school type*
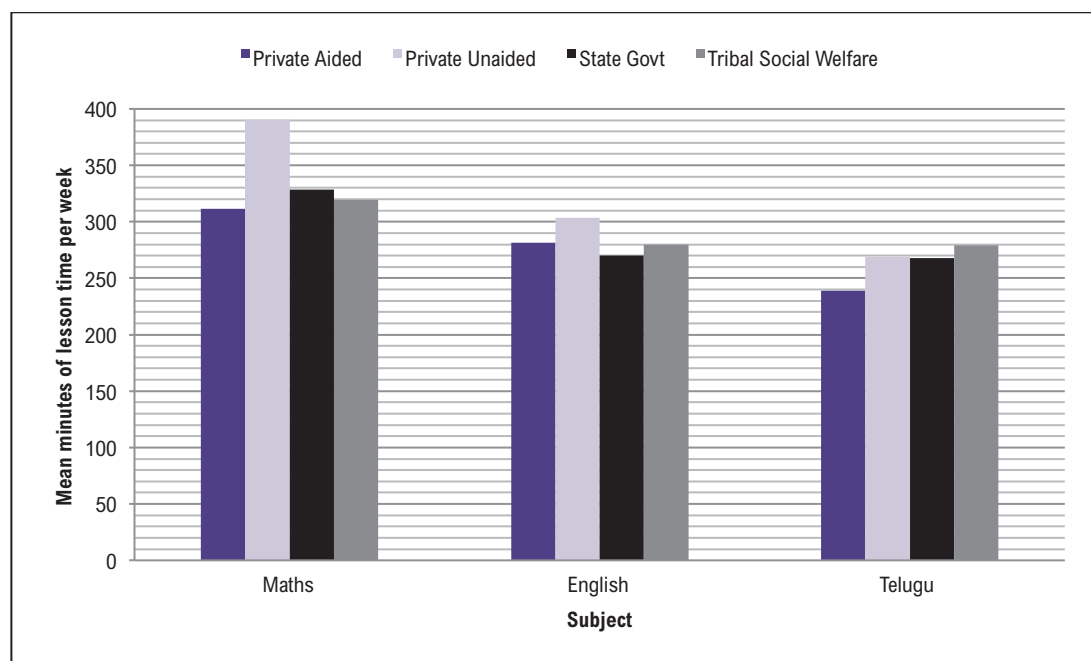
2.2 Head teacher and teacher characteristics

In each school, the survey collected data from the head teacher and from all maths and English teachers who taught Class 9 students during the 2016-17 school year. This section presents descriptive statistics relating to some of the key characteristics of the teachers included the school survey sample.[21]

2.2.1 Head teacher characteristics

The majority of schools surveyed had a male head teacher (with the exception of Private Aided schools), with a mean age of between 45-55 years, as presented in Table 9. Private Unaided school head teachers had more years of teaching experience on average than those in State Government or Tribal/Social Welfare schools, but were slightly less likely to have a B.Ed or higher teaching qualification, or to currently have teaching responsibilities.

Table 9. *Head teacher characteristics, by school type*

School type	Mean age of head teacher	Male head teacher (%)	Mean years of experience as a head teacher	Head teacher has a B.Ed degree or higher (%)	Head teacher has current teaching responsibilities (%)
Private Aided	56	34	7	100	93
Private Unaided	45	73	10	89	76
State Government	47	68	2	100	91
Tribal/Social Welfare	50	69	2	97	83
Sample mean	**48**	**65**	**5**	**97**	**86**

There was a considerable difference in the place of birth and current place of residence for head teachers from different types of schools, as shown in Table 10. A much greater proportion of head teachers from Private Aided or Private Unaided schools were employed in the village or town they were originally from, when compared to head teachers in State Government or Tribal/Social Welfare schools. They were also more likely to currently live within the same village or town as the school they were working in. This also related to the locality of the school – head teachers in urban schools were much more likely to be living and working in their place of birth than those in rural schools.

Table 10. *Head teacher place of birth and current place of residence, by school type and locality*

School type	Head teacher is originally from this village or town (%)	Head teacher currently lives in this village or town (%)
Private Aided	69	97
Private Unaided	64	84
State Government	25	28
Tribal/Social Welfare	28	56
Urban	71	92
Rural	26	39
Sample mean	**42**	**58**

21 Weights have not been applied for analysis at head teacher or teacher level. Findings presented in this section represent only those schools actually sampled for the 2016-17 school survey.

2.2.2 Teacher characteristics

Surveyed teachers had a mean age of 41 years, with those working in Private Unaided schools and Tribal/Social Welfare schools being younger on average than those in State Government or Private Aided schools. A greater proportion of the State Government school teachers were male, while more of those from Tribal/Social Welfare schools and Private Aided schools were female.

As Table 11 shows, State Government teachers and those from Private Aided schools had, on average, more years of teaching experience and higher teaching qualifications than those from Private Unaided schools. State Government teachers were also much more likely to have a permanent contract than those from other school types, particularly in comparison to those teaching in Private Unaided schools.

Table 11. *Selected teacher characteristics, by school type*

School type	Mean teacher age	Male teachers (%)	Mean years of experience as a teacher	Teacher has a B.Ed degree or higher (%)	Teacher has permanent contract (%)
Private Aided	46	43	17	89	56
Private Unaided	36	55	11	70	28
State Government	43	61	14	86	82
Tribal/Social Welfare	36	39	9	80	60
Sample mean	41	54	13	81	61

As with head teachers, there was considerable variation in teachers' place of birth and current place of residence by type of school, and by school locality. Teachers in Private Aided and Private Unaided schools were much more likely to currently live in the same village or town as the school they worked in than those working in State Government or Tribal/Social Welfare schools. A minority of teachers in all school types worked in schools in the same village or town they were originally from –this was particularly the case for those employed within State Government and Tribal/Social Welfare schools.

Table 12. *Teacher place of birth and current place of residence, by school type and locality*

| School type	Teacher is originally from this village or town (%)	Teacher currently lives in this village or town (%)
Private Aided	46	80
Private Unaided	31	65
State Government	13	27
Tribal/Social Welfare	5	30
Rural	10	24
Urban	37	75
Sample mean	**21**	**44**

2.3   Student characteristics

This section presents descriptive statistics about the characteristics of the Class 9 students in the school survey.[22]

2.3.1 Student background characteristics

Overall, the sample included slightly more girls than boys (55 per cent female), although this varied by school type and by site).[23] As Figure 4 shows, in four of the sites (one in Srikakulam, one in Anantapur, and two in Mahbubnagar) there were more boys than girls participating in the survey, while in two sites (one in Srikakulam and one in West Godavari) the distribution of boys and girls was almost completely even. In the other 14 sites, there were more girls than boys surveyed. More male students were found in Private Unaided schools than any other school type (see Table 14), but even in this school type the sample included slightly more girls than boys overall (52 per cent to 48 per cent respectively).

Figure 4.   *Student gender, by site*
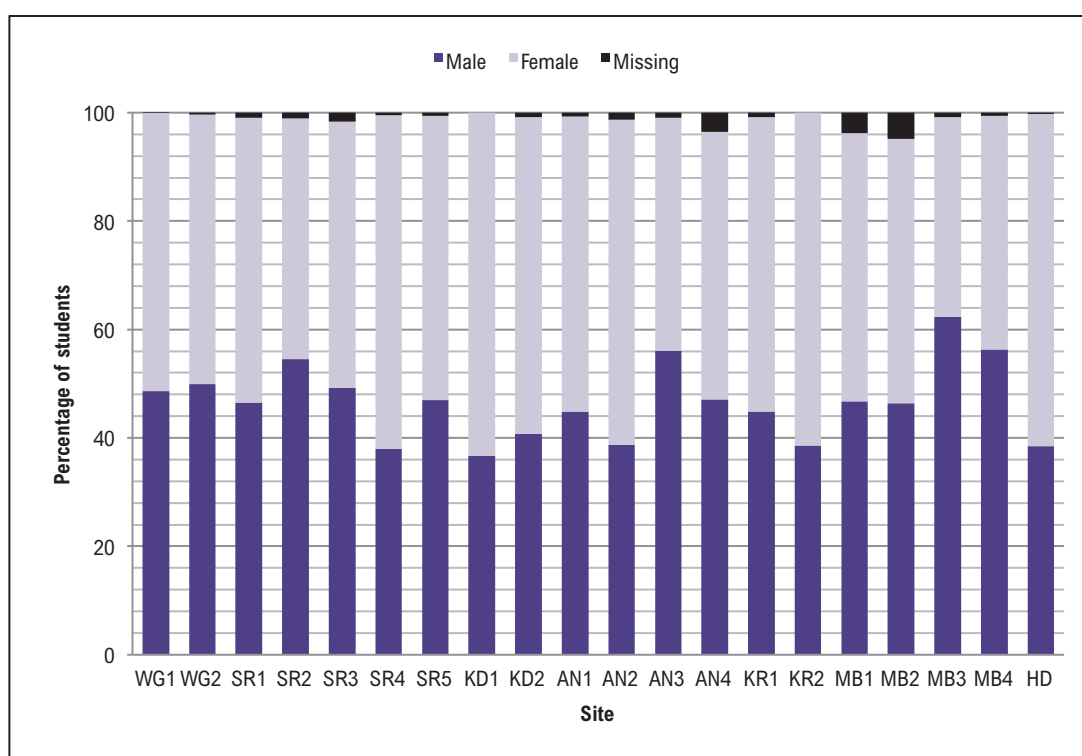
Student characteristics varied considerably by the district they were located within. Table 13 presents selected background characteristics for students, by district. A greater proportion of disadvantaged students were found in sites in Mahbubnagar district, followed by those in

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22 All analysis of student-level data in this section has been weighted to take account of the oversampling of certain school types. This means that the student data can be said to be representative at the site level. See Section 3 for more details on how weights have been developed and applied.

23 As the student sample includes only those students present in school on the day of the survey visit at the beginning of the school year, this indicates that more girls than boys were present in school on that day.

sites in Srikakulam and Kadapa. Students in sites in Mahbubnagar and Kadapa were also more likely to report having no books at home.

Students reported how much time they spent working on the family farm or business, doing chores, or working for pay on a 'usual school day'; these findings are presented in Table 13. Students reported doing chores at home much more frequently than working on the family farm/business or working for pay. There is considerable district-level variation in the amount and types of work reported, with students in sites in Mahbubnagar spending considerably more time on all three types of work than students in the other districts.

Table 13. *Student background, by district*

District	Percentage of students from the most disadvantaged tercile in this site (%) *	Students who have lost at least one parent (%)	Students who report having no books at home (%) **	Students who report spending some time on the following activities on a usual school day ***		
				Working on the farm or family business (%)	Chores or caring for family members (%)	Working for pay (%)
West Godavari sites	12	8	20	4	35	3
Srikakulam sites	37	8	19	23	45	9
Kadapa sites	25	7	37	23	62	3
Anantapur sites	17	8	23	22	69	7
Karimnagar sites	8	7	23	18	51	7
Mahbubnagar sites	48	11	38	58	72	29
Hyderabad site	9	6	17	7	51	7
Sample mean	**-**	**8**	**21**	**18**	**53**	**8**

Notes: * In the student questionnaire, students were asked about assets and household consumer durables found in their home. This data was used to construct a composite index score showing relative household economic advantage. Further details about the construction of this score are in Section 3. ** Excluding school textbooks. *** The questionnaire asked students to specify the amount of time they spent working on these different tasks, from none to more than three hours. Data in this table collates all responses from less than one hour to more than three hours (e.g. excluding anyone who reported they spend no time on an activity).

As might be anticipated, there are also clear differences in characteristics of students attending different types of school, as shown in Table 14. More students in Private Unaided schools were male, were from more advantaged social categories, and had two parents who could read and write. Fewer Private Unaided school students were in the most economically disadvantaged tercile, just 4 per cent, compared to 52 per cent of those in Tribal/Social Welfare schools. These characteristics show the considerable differences in student intake between the different types of school.

Table 14. *Selection student characteristics, by school type*

| School type	Male students in each school type (%)	Mean student age in each school type (years)	Students from the most disadvantaged tercile in each school type (%)	Students from each social category within each school type (%) *				Parental literacy in each school type (%)	
				SC	ST	OBC	GC	Neither parent can read	Both parents can read
Private Aided	30	14	18	26	2	46	26	8	74
Private Unaided	48	14	4	7	1	49	43	4	85
State Government	42	14	37	20	5	65	8	22	54
Tribal/Social Welfare	42	14	52	19	78	3	1	26	51
Sample mean	**45**	**14**	**-**	**13**	**7**	**52**	**28**	**12**	**73**

Notes: * Scheduled Caste (SC), Scheduled Tribe (ST), Other Backward Class (OBC), and General (Other) Class (GC), are official designations made by the Government of India.

2.3.2   Enrolment and attendance

The longitudinal nature of the 2016-17 school survey allows us to look at how patterns of student enrolment and attendance changed over the course of the school year.

At the beginning of the school year, the mean attendance rate for the sample overall was 85 per cent.[24] This varied between sites, as shown in Figure 5, with the lowest attendance (72 per cent) found in a site in Mahbubnagar, and the highest attendance (95 per cent) in a site in Anantapur. Attendance rates also varied slightly by school type, with the highest rates of attendance found in Tribal/Social Welfare schools. This is as expected, as almost all of these are residential schools.

Figure 5.   *Wave 1 student attendance rate, by site*
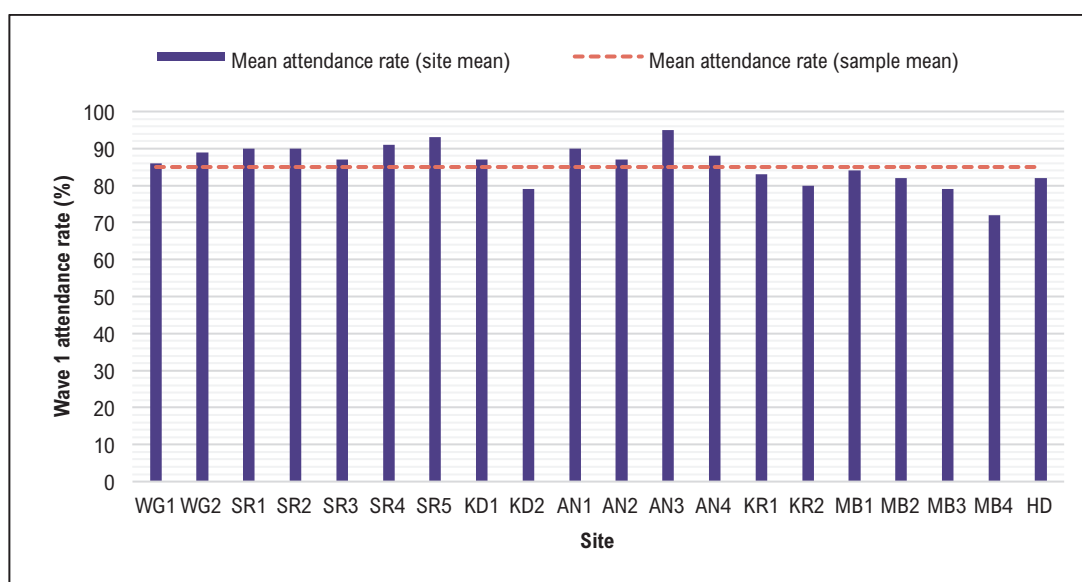
A similar picture can be seen when we look at attendance at Wave 2 of those students who participated in Wave 1 (Figure 6).[25] The overall attendance rate of these students is 85 per cent, with the lowest rate (70 per cent) found in a site in Anantapur and the highest rate (91 per cent) found in a site in Srikakulam.

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24 Attendance rate is calculated as the number of students present on the day of the Wave 1 survey (and therefore participating in the survey), compared to the total number of students enrolled at that point according to school records.

25 This is calculated as the number of students from Wave 1 who were present on the day of the Wave 2 survey visit (and who therefore participated in Wave 2), compared to the total number who participated in Wave 1.

Figure 6.   *Rate of attendance of Wave 1 students at Wave 2*
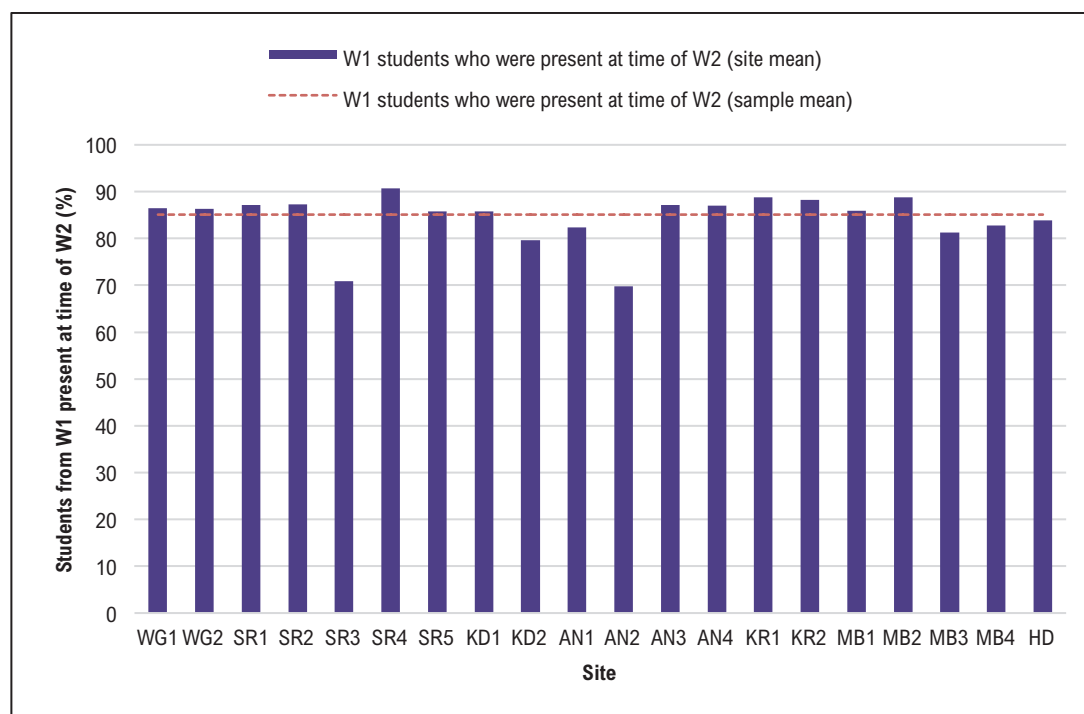
Notes: Wave 2 also includes students listed as no longer enrolled at the school.

2.3.3   Student mother tongue and language of instruction

The majority of students in the survey (76 per cent) speak Telugu as their first language, while 14 per cent speak Urdu as their mother tongue. A number of other languages are also spoken by students in smaller proportions across the sites. Students' first language varies considerably by location, with the most linguistic variation found in Hyderabad (Table 15).

Table 15.   *Student first language, by district*

District	Students' mother tongue (where >1%)						
	Telugu (%)	Urdu (%)	Hindi (%)	Oriya (%)	Kannada (%)	Other (%)	Missing (%)
West Godavari sites	92	3	-	-	-	4	-
Srikakulam sites	89	-	-	3	-	6	-
Kadapa sites	97	3	-	-	-	-	-
Anantapur sites	74	14	1	-	8	3	-
Karimnagar sites	76	19	2	-	-	2	-
Mahbubnagar sites	89	2	-	-	-	5	2
Hyderabad site	54	32	8	-	2	3	-
Sample mean	**76**	**14**	**3**	**1**	**2**	**4**	**1**

The linguistic diversity of the sites, along with the prevalence of English medium education, means that a large proportion of students are not learning in their mother tongue. As shown in Table 16, across all school types and sites just 28 per cent of students are enrolled in a section in which the medium of instruction is the same as the language they speak at home. This varies considerably by school type – in Private Unaided schools, it is as low as 3 per cent, while in State Government schools it is as high as 64 per cent. It also varies by locality

– students in rural areas are much more likely to learn in their mother tongue than those in urban areas. In Hyderabad, the most linguistically diverse site in the sample, just 12 per cent of students are learning in their mother tongue.

Table 16.   *Language of instruction, by school type and district*

District	Students in each school type whose medium of instruction is the same as the language they mostly speak at home (%)				
	Private Aided	Private Unaided	State Government	Tribal/Social Welfare *	Sample mean
West Godavari sites	69	0	52	43	28
Srikakulam sites	100	4	74	27	41
Kadapa sites	-	0	48	-	39
Anantapur sites	63	1	43	0	20
Karimnagar sites	36	9	81	20	30
Mahbubnagar sites	-	15	85	9	71
Hyderabad site	53	0	50	-	12
Sample mean	**59**	**3**	**64**	**29**	**28**

Notes: * Many children attending Tribal/Social Welfare schools speak a tribal language as their mother tongue (many of which do not have a written form) and so are particularly unlikely to learn in this language at school.

2.3.4 Educational history and life at school

This section presents findings relating to students' educational history and experience of school, including grade repetition, dropout, and homework.

Throughout their time in school, 14 per cent of students report repeating one or more grade, and 7 per cent report having dropped out of school at least once.[26] There is a lot of variation by site, as shown in Figure 7, ranging from 39 per cent who repeated a grade in one of the sites in Srikakulam to 8 per cent repeating a grade in Hyderabad. Reports of dropping out also differed by site, with 3 per cent of students in Hyderabad reporting that they had dropped out at least once, compared to 48 per cent in one site in Mahbubnagar.

As shown in Table 17, there is also a lot of variation in grade repetition and dropout by school type. The greatest occurrence of grade repetition was found in students attending Tribal/Social Welfare schools, where around 26 per cent reported repeating a grade once (including 4 per cent who had repeated a grade at secondary level), and 4 per cent had repeated more than one grade. Rates of dropout were also high among those attending Tribal/Social Welfare schools, and State Government schools, and were lower amongst students in Private Aided and Unaided schools.

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26 Dropping out is defined as being absent from school continuously for 20 days or more. Students taking part in the survey are those who are currently in school, therefore rates of 'dropout' discussed here are children who have left school but have then re-joined.

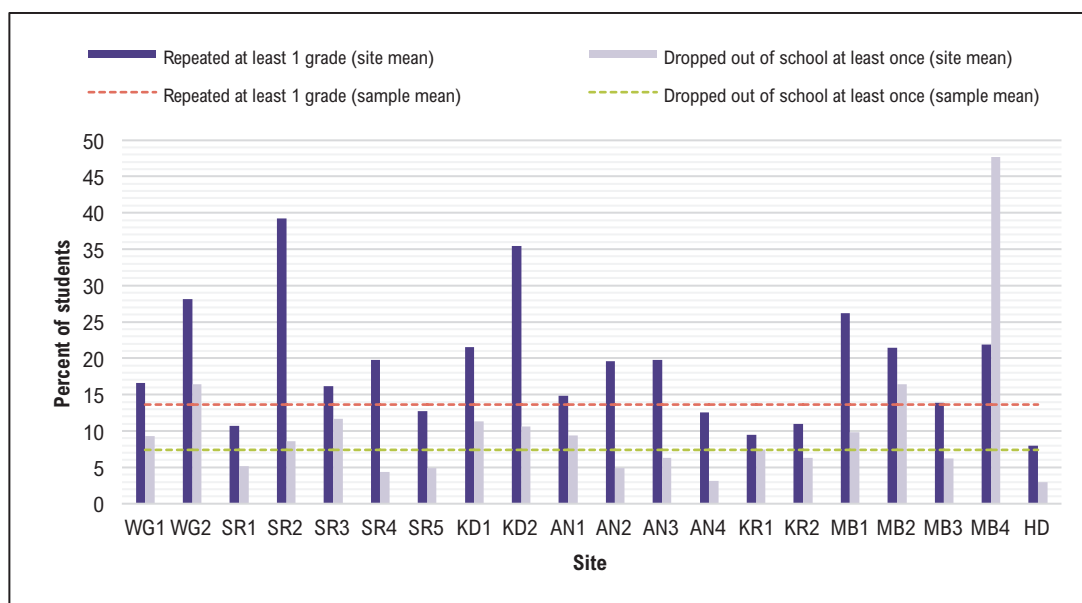**Figure 7.** *Incidence of grade repetition and dropout, by site*

Table 17. *Grade repetition and dropout, by school type*

School type	Grade repetition				Dropped out of school at least once (%)
	Never repeated a grade (%)	Reported repeating one grade (%)	Reported repeating more than one grade (%)	Have repeated at least one grade at secondary level (%) *	
Private Aided	84	15	1	1	5
Private Unaided	93	7	1	1	6
State Government	80	19	2	2	10
Tribal/Social Welfare	70	26	4	4	10
Sample mean	**86**	**12**	**1**	**1**	**7**

Notes: * Secondary school in AP and Telangana covers Grades 8-10. This column relates to students who report that they have repeated a grade in Class 8 or Class 9.

Students were also asked to report on how often they received homework in different subjects, as well as how often this homework is marked by their teachers. Around 45 per cent of students on average reported that they were given maths homework more than three times per week, and around 31 per cent said the same for English. This differed by school type, with a greater proportion of students in Tribal/Social Welfare schools reporting that they received homework more than three times per week than students in other types of schools. Around 42 per cent of students reported that their maths homework is always marked, and 43 per cent said the same for their English homework. This was similar across the different types of schools, although it is notable that a higher proportion of students in Private Unaided schools reported that their homework is always marked compared to students from other school types.

**Table 18.** *Student experiences of homework*

	Maths homework is given more than three times per week (%)	Maths homework is always marked (%)	English homework is given more than three times per week (%)	English homework is always marked (%)
Private Aided	40	40	32	38
Private Unaided	45	45	27	48
State Government	46	37	36	38
Tribal/Social Welfare	49	41	38	40
Sample mean	**45**	**42**	**31**	**43**

3.3.5 Student opportunities outside school

As well as different experiences within school, students also reported having very different opportunities outside school, for example, participation in private tuition and opportunities to practice speaking English.

As shown in Figure 8, there was a great deal of variation in students reporting participation in private tuition outside school. Students in Private Unaided and Private Aided schools more frequently reported that they attend private tuition in maths, English or another subject than students from other school types. In total, over a third of students in Private Unaided schools reported attending private tuition in at least one subject for at least one hour per week, compared to just 4 per cent of those in Tribal/Social Welfare schools and 11 per cent of those in State Government schools.

Figure 8. *Students attending private tuition, by school type*
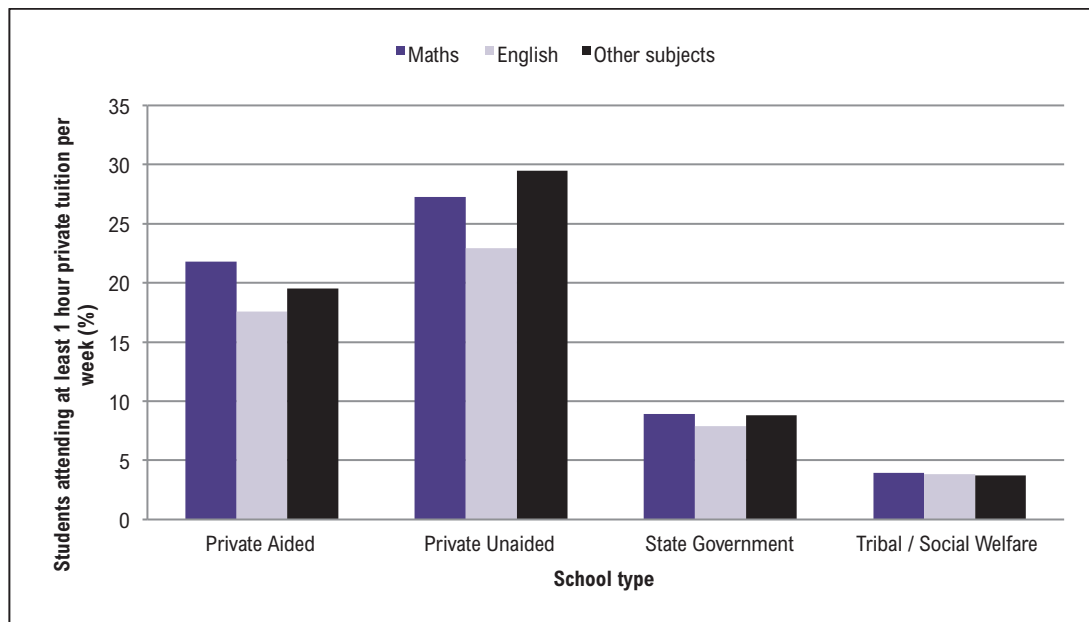
As well as private tuition, students also reported different levels of exposure to English, including their opportunities to practice English outside of their school English lessons, as shown in Table 19.

Overall, around 81 per cent of students began learning English in Class 3 or earlier, although this was less common for students attending Tribal/Social Welfare schools (59 per cent). A

relatively high proportion of students in all school types reported that they have the opportunity to practice speaking English to friends, and, to a lesser extent, siblings, while those in Private Unaided and Private Aided schools were more likely to also be able to practice speaking English with their parents. Students in all school types reported having the opportunity to read English books and magazines outside school, and to watch English language movies or television programmes.
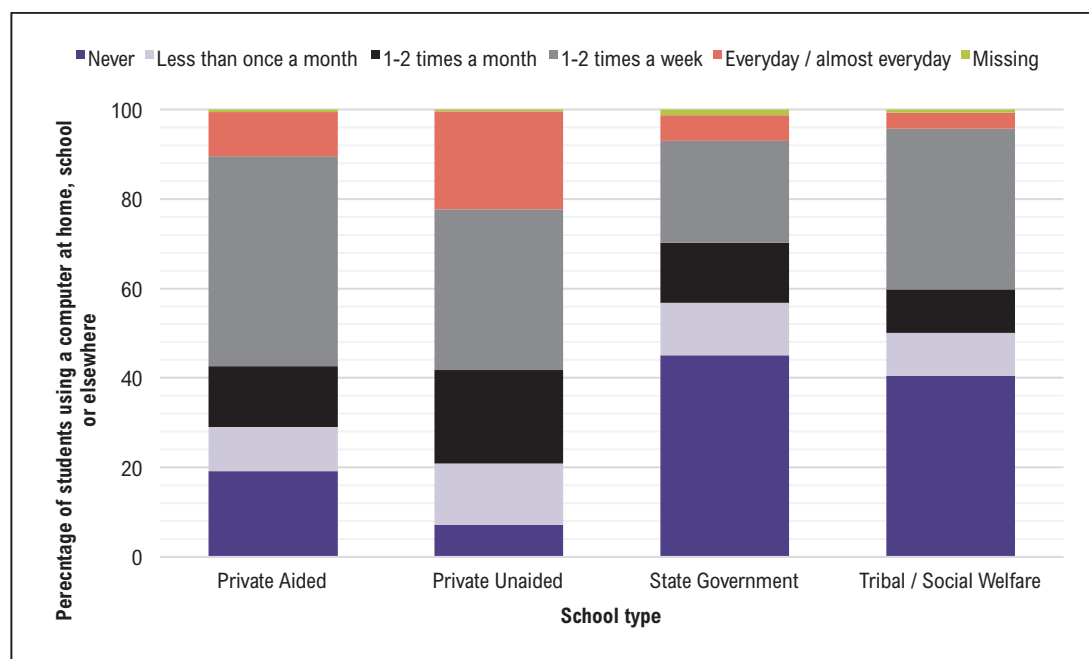
Student use of a computer (whether at home, at school, or elsewhere) also varied considerably by school type (see Figure 9). While 45 per cent of students in State Government schools reported that they never used a computer, 58 per cent of those in Private Unaided schools used a computer somewhere at least once a week.

Table 19.   *Student exposure to English outside school, by school type*

School type	Started learning English in Class 3 or earlier (%)	Student has the opportunity to practice speaking English to these people (%) *				Student has the opportunity to practice English in these ways (%) *	
		Mother	**Father**	**Siblings**	**Friends**	**Read books, magazines or newspapers in English**	**Watch TV or movies in English**
Private Aided	74	36	39	69	80	86	80
Private Unaided	87	46	49	78	90	95	87
State Government	75	13	15	49	63	76	73
Tribal/Social Welfare	59	10	14	46	70	86	81
Sample mean	**81**	**32**	**35**	**65**	**79**	**87**	**82**

Notes: * This includes students who reported that they have the opportunity to do this occasionally or often (e.g. it excludes anyone who said they never have the opportunity to do this, or that it is not applicable).

Figure 9.   *Student use of a computer, by school type*

Notes: This collates student responses about their frequency of use of a computer at home, at school and in any other place.

2.4   Student cognitive achievement and learning gain

Student cognitive performance in maths, functional English, and transferable skills was measured using assessments which were administered at the beginning and end of the school year (for maths and English) and at the end of the school year only (for transferable skills). This section presents findings relating to student performance in these cognitive tests, as well as the progress made between the beginning and end of the school year in maths and English. Test scores have been transformed using two-parameter IRT, and have been scaled to have a mean of 500 and a standard deviation of 100 (see Section 1.4). Maths and English test scores from Wave 1 and Wave 2 have been put onto a common scale, enabling learning gain during the school year to be measured.[27]

Tables 20, 21 and 22 report the mean scores of the maths, English and transferable skills cognitive tests for different groups in the sample and overall. They show an average increase of 30 points of learning gain in maths, and 10 points in functional English, both of which are statistically significant average learning gains.

2.4.1   Cognitive achievement: maths

The mean maths performance for the sample increased between Wave 1 and Wave 2, revealing an overall learning gain of 30 points, or just under a third of a standard deviation, over the course of the school year. Figure 10 shows the distribution of the scores in Wave 1 and Wave 2.

Cognitive achievement and progress varied by school type and locality, as shown in Table 20, with Private Unaided schools and those in urban areas having both higher scores in Wave 1 and making greater than average progress between Wave 1 and Wave 2. Learning gain ranged from a mean of 40 points in Private Unaided schools to a mean of 9 points in Private Aided schools, suggesting that gaps in learning attainment between students in different school types are widening over time. By the end of Class 9, the mean score for students in Private Unaided schools was more 100 points (or one standard deviation) higher than for students in State Government or Tribal/Social Welfare schools. This is equivalent to more than three average years' learning gain on our scale, where the average learning gain in one school year is around 30 points.

Other gaps in learning gains are also present. Students in urban schools made more progress on average than students in rural areas, meaning the gap between these two groups grew slightly between the beginning and end of the school year. Meanwhile, although boys had slightly higher scores than girls in both Wave 1 and Wave 2, girls made more progress, which allowed this gap to narrow somewhat.

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27 See Section 3 for more details of this scaling process.
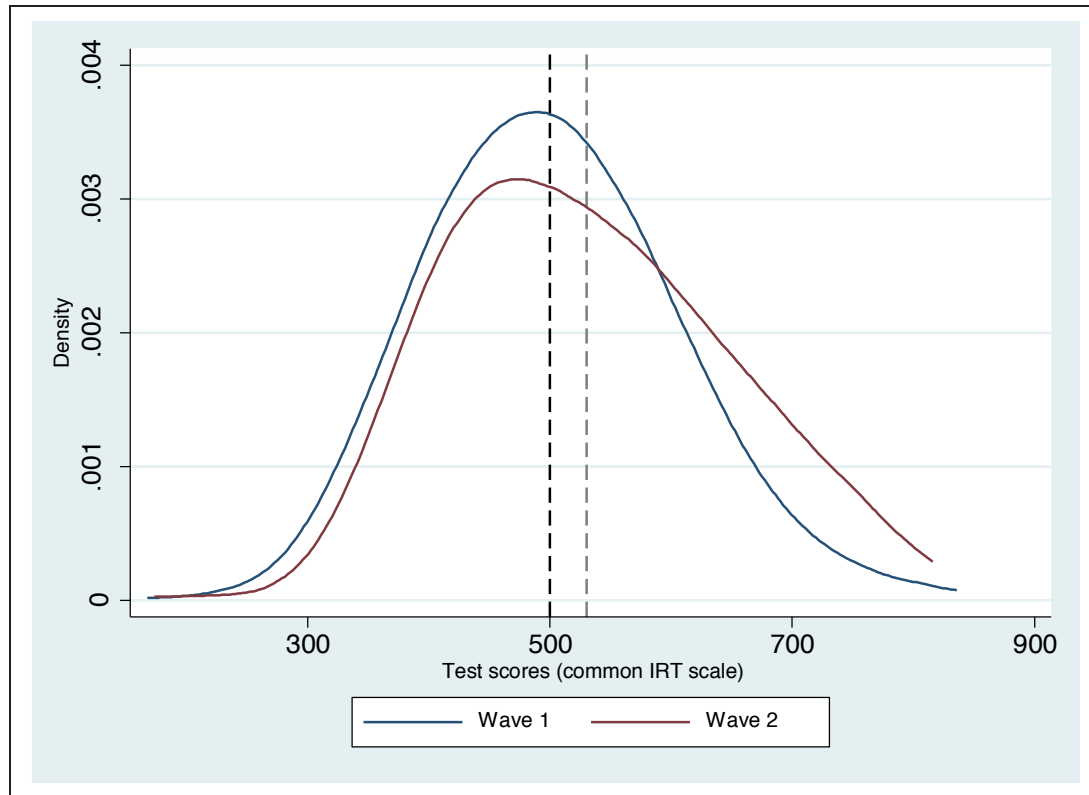
Figure 10. *Wave 1 and Wave 2 maths performance*

Table 20. *Wave 1 and Wave 2 maths performance*

	By school type				By locality		By gender		Sample mean
	Private Aided	Private Unaided	State Government	Tribal/Social Welfare	Rural	Urban	Male	Female	
Maths Wave 1 test score	472	535	456	412	469	515	511	492	500
Maths Wave 2 test score	481	575	473	439	495	548	540	523	530
Mean W1-W2 learning gain	9***	40***	17***	27***	26***	33***	28***	32***	30***

Notes: *** T-test of the difference in means is significant at the 1% level.

There was also considerable variation in performance between sites. As Figure 11 shows, this was largely consistent across both waves, although some sites made more or less progress. In Wave 1, test scores covered a range of approximately 130 points, from 396 to 527 (both from sites in Srikakulam). By Wave 2, this gap had increased somewhat, covering a range of 140 points between 423 (a site in Mahbubnagar) to 564 (a site in Srikakulam).

Figure 11. *Wave 1 and Wave 2 maths performance*
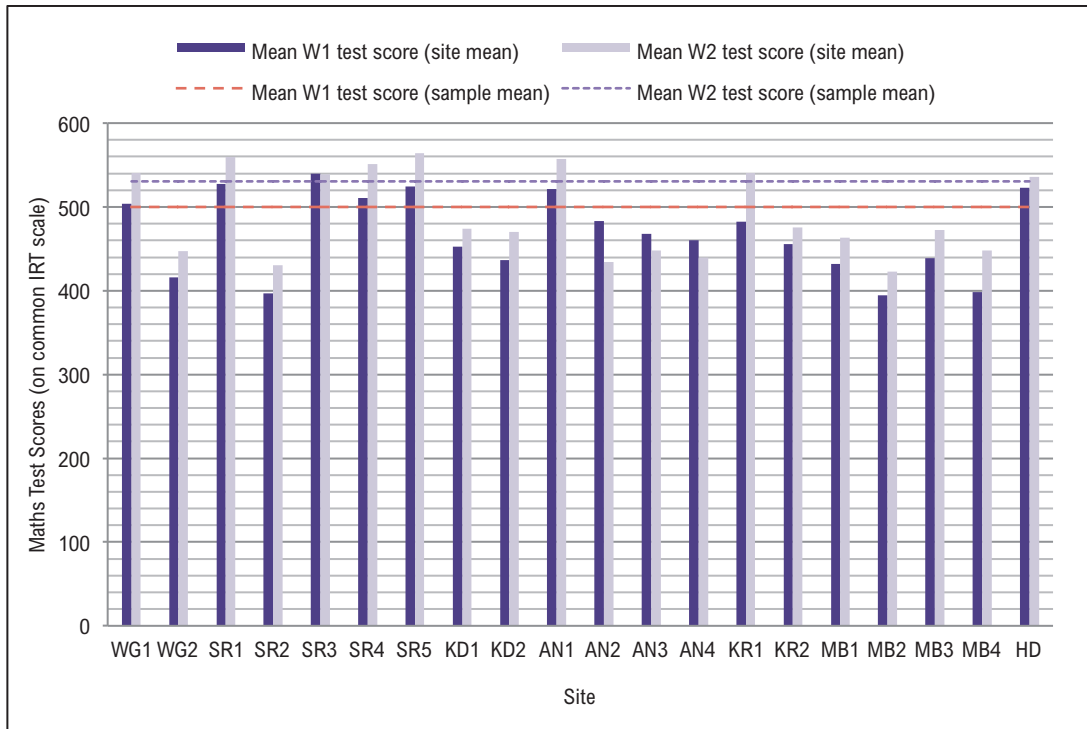
2.4.2 Cognitive achievement: functional English

Learning gains were also seen in functional English, with a mean increase in test score of around 10 points over the course of the school year. Figure 12 shows the distribution of the scores at the beginning and end of the school year. This shows that there is a slight ceiling effect, which means the performance of students at the very top of the ability distribution has not been fully captured by these tests. This reveals the difficulty of measuring the very wide range of English ability present in this sample using a 50-item test.

The patterns of learning attainment and progress for English are similar to those seen in maths, but with even greater differences apparent between different school types, and urban and rural areas. In both Wave 1 and Wave 2, students in Private Unaided schools were more than 100 points (or one standard deviation) ahead of students in all other school types. However, when looking at the learning gains made, students in Tribal/Social Welfare schools can be seen to have made the most progress (Table 21), although from a much lower initial point. As a result, the gap between Tribal/Social Welfare schools and other school types narrowed considerably between Wave 1 and Wave 2, although Private Unaided schools remained a long way ahead. Another notable point is that girls made considerably more progress in English than boys. As a result, they moved from a slightly lower score at the beginning of the school year, to a slightly higher score at the end of the school year.

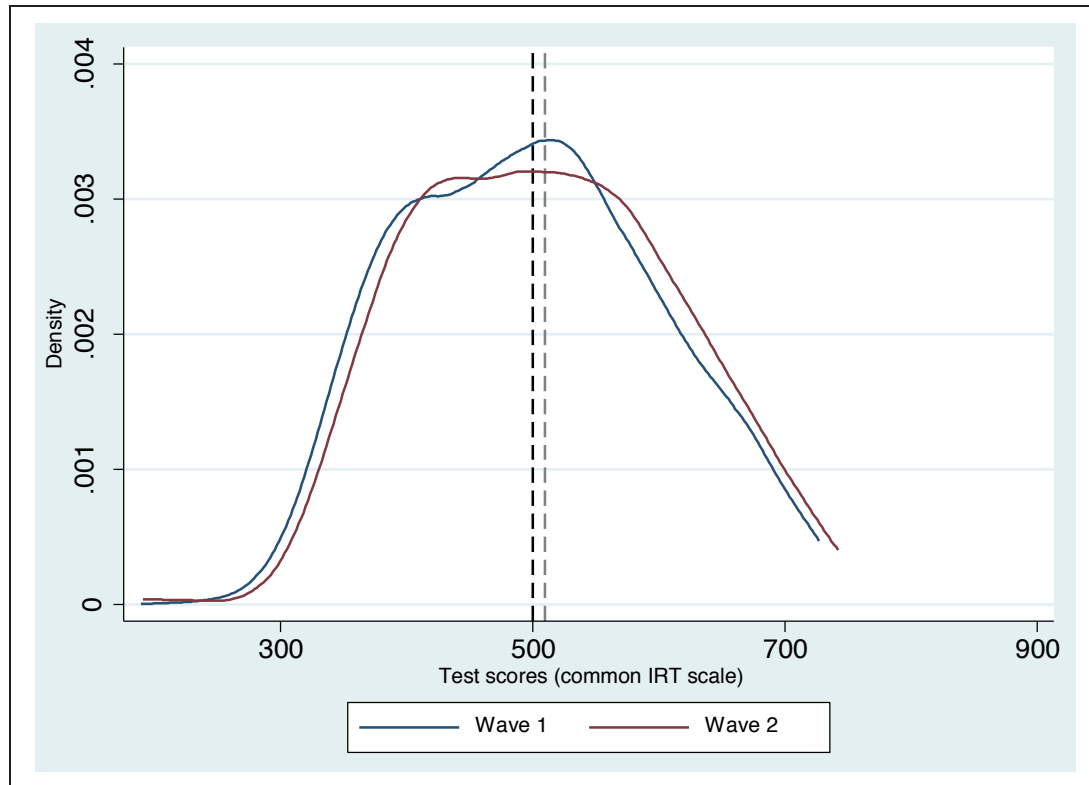**Figure 12.** *Wave 1 and Wave 2 English performance*

Table 21. *Wave 1 and Wave 2 English performance*

	By school type				By locality		By gender		Sample mean
	Private Aided	**Private Unaided**	**State Government**	**Tribal/ Social Welfare**	**Rural**	**Urban**	**Male**	**Female**	
English Wave 1 test score	454	555	423	402	438	531	503	498	500
English Wave 2 test score	462	567	427	421	444	542	508	511	510
Mean W1-W2 learning gain	8***	12***	4***	18***	7***	11***	5***	13***	10***

Notes: *** T-test of the difference in means is significant at the 1% level.

As shown in Figure 13, there was even more variation between sites in terms of English performance than for maths, with scores ranging from 379 (a site in Mahbubnagar) to 576 (Hyderabad) in Wave 1, and with a similar range in Wave 2. This represents a gap of almost two standard deviations between the highest and lowest achieving sites. Notably, the highest achieving sites – those shown in Figure 13 to have exceeded the sample mean – are all urban sites.

Figure 13. *Wave 1 and Wave 2 English performance, by site*
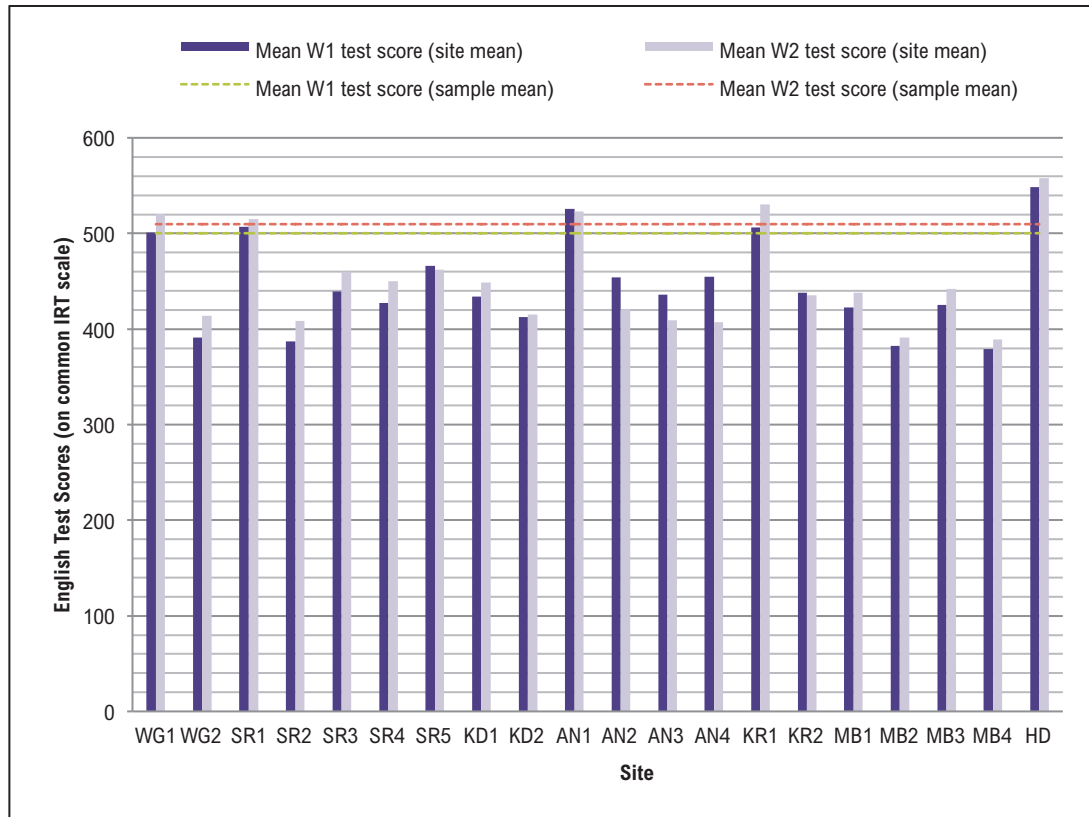
2.4.3 Transferable skills

Unlike maths and English, transferable skills was measured cross-sectionally, that is, through just one test at the end of the school year. As a result, we can only look at the distribution of scores, and at relative score comparisons between groups within the sample, rather than looking at progress.

Figures 14 and 15 show the distribution of the problem solving and critical thinking test scores. Figure 15 shows that there is a slight floor and ceiling effect on the critical thinking test, which means the performance of students at the very bottom and top of the ability distribution has not been fully captured by these tests, perhaps because they are relatively short tests.

The patterns of learning attainment and progress are similar to those seen in English and maths, with differences apparent between different school types, and urban and rural areas (see Table 22). The gaps between different school types are similar to those seen for maths and English, although slightly less pronounced. It is notable that for both problem solving and critical thinking, girls are performing better than boys.

Figure 14. *Problem solving performance*
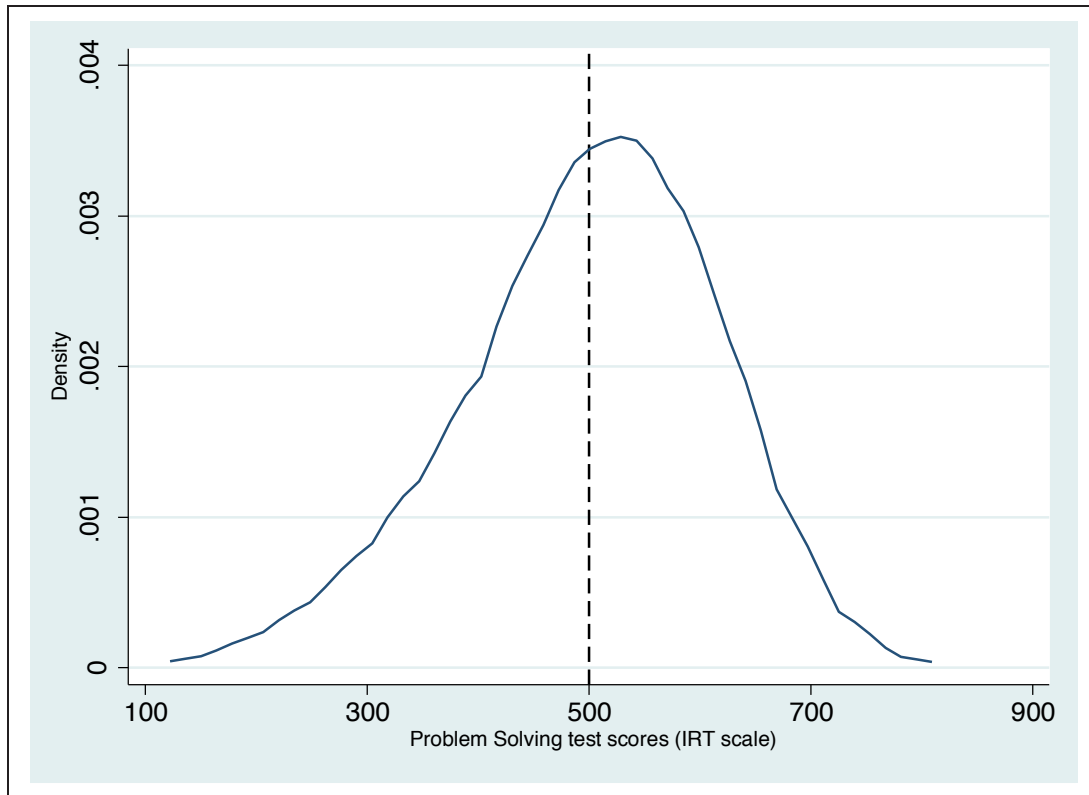
Figure 15. *Critical thinking performance*
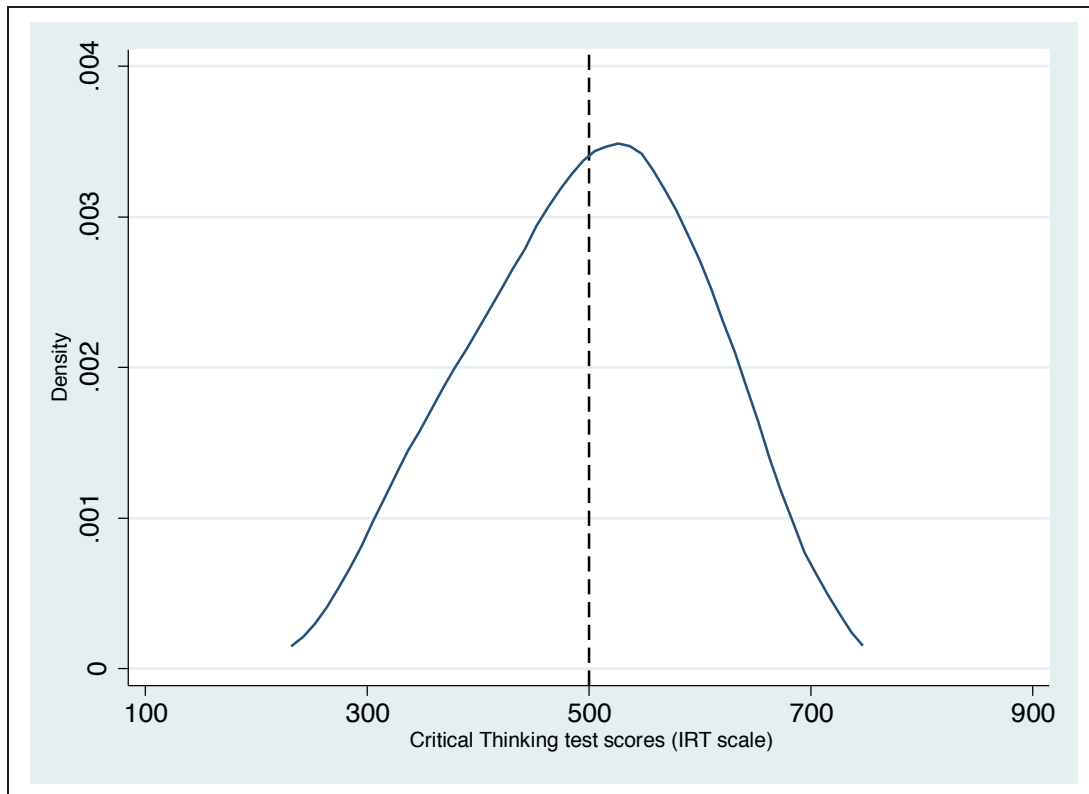
Table 22.   *Transferable skills performance*

	By school type				By locality		By gender		Sample mean
	Private Aided	**Private Unaided**	**State Govern- ment**	**Tribal/ Social Welfare**	**Rural**	**Urban**	**Male**	**Female**	
Problem solving test score	463.83	520.86	475.15	459.74	483.65	507.96	493.31	505.23	500
Critical thinking test	464.32	522.55	472.81	452.18	485.01	507.15	493.7	505.17	500

As shown in Figure 16, there is also variation in student performance in transferable skills between sites. Most sites have a similar mean performance in problem solving and critical thinking, although there are some exceptions where students are performing better in one test or the other, for example two of the sites in Srikakulam.

Figure 16.   *Transferable skills performance, by site*
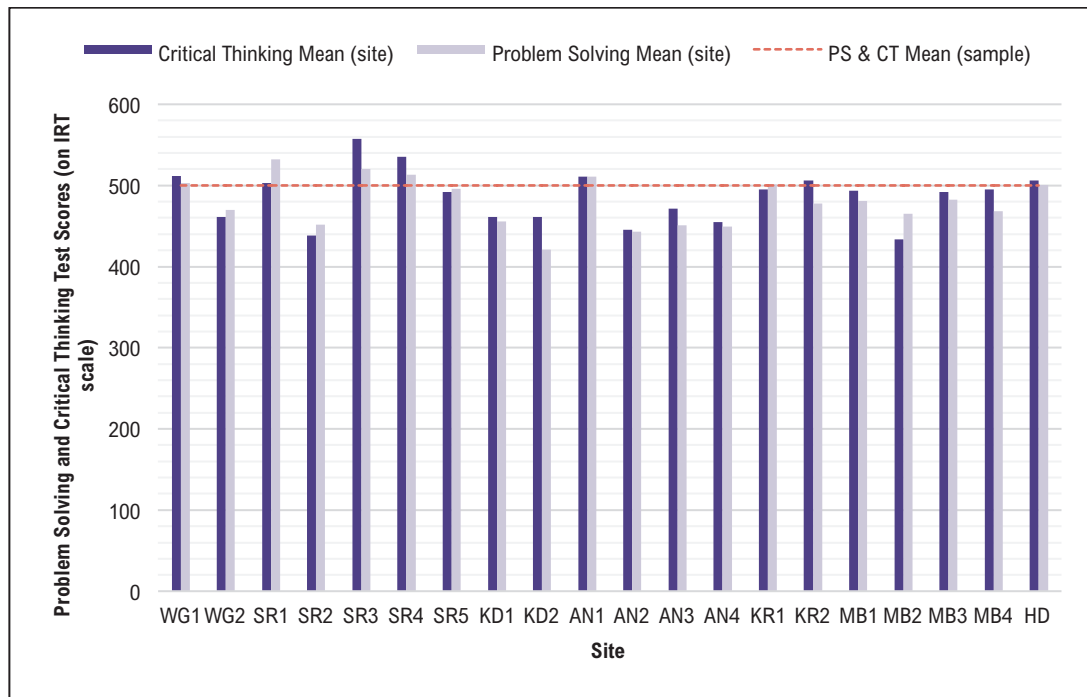
3. Technical Information

3.1 Mass scale assistance analysis

When conducting large-scale assessments, it is not always possible to guarantee that 'ideal' test conditions have been met. On occasion, this can sometimes result in problematic situations, such as whole sections copying or getting help (from the teacher or externally). This is referred to as 'mass scale assistance'. For this reason, it is important to be able to identify any data collected from the field which may not accurately represent reality. To support this, Educational Initiatives ran internal checks on assessment data to identify any schools or sections where it appears that there is high possibility that mass scale assistance may have taken place. Such sections or schools can then be excluded from analysis. The focus of such checks is on mass scale assistance at the section level; it is not intended to identify individuals or pairs of students who are copying.

The basic assumption underlying copying analyses is that the test data of a section where mass copying has happened will have statistical anomalies which will be generally absent from a regular dataset. The copying analysis captures these anomalies using two different mathematical metrics:

- The first metric quantifies the similarity in questions answered incorrectly by a pair of students and the similarity of responses on those incorrect questions. This metric is calculated for all the pairs of students in the class and then averaged for all the pairs. Values for this index range between 0 and 1, where 0 indicates no similarity on the wrong questions or the options chosen on wrong questions and 1 indicates having exactly the same wrong questions and same wrong option for every wrong questions for each pair.

- The second metric benchmarks the class performance on individual questions to the overall performance and captures large deviations. This metric works on the principle that the question-wise performance pattern for a section should be similar to the question-wise performance pattern of the overall system of which school is a part. This assumes that questions that are easy at the overall system level will also be relatively easy for any specific school. Similarly, those questions which students across the system find difficult should be relatively difficult for any specific school in that system. When mass copying happens, we see that this pattern is disturbed. Such deviations in question-wise performance pattern are found to be a reliable indicator of mass scale assistance.

Educational Initiatives used these copying analyses to identify any unusual patterns in test data at the section level. Eight sections with potentially suspicious test data were highlighted for the English tests, and nine sections for the maths tests. These sections have been excluded from all analysis of the student achievement data within this report.

Table 23. *Schools, sections and students identified in mass scale assistance analysis*

Schools with at least one section identified in mass scale assistance analysis (total)	Sections identified in mass scale assistance analysis in Wave 1 and/or Wave 2 (total)		Students identified in mass scale assistance analysis in Wave 1 and/or Wave 2 (total)	
	English test	Maths test	English test	Maths test
11	8	9	208	216

It is important to note that this analysis only indicates that there is a high probability of copying in any given section or school, rather than confirming it definitively. In addition, it is worth noting that although these analyses are intended to identify all sections and schools where mass copying may have happened, it is still possible that some instances may have escaped notice. However, to our knowledge, the instance of such cases is generally low.

3.2   Weighting procedures

Due to the sampling strategy used in data collection (see Section 1), sampling weights are required for the data to be representative of pupils in different school types at the Young Lives site level. Weights have been calculated as *N*/*n*, where *N* (population) equals the total number of students enrolled in schools with 15 or more students in Class 9 in one of four school types within the Young Lives sites. DISE 2015-16 data were used to identify this population.[28] Meanwhile, *n* is the sample, and is equal to the total number of students enrolled in the sampled schools of one of the four school types. This is calculated based on number of students enrolled in each sampled school at the beginning of the 2016-17 school year, as identified through this survey.

For this report, weights have been applied to data whenever it is analysed at the student level. This allows us to consider the data as representative of students attending these four school types in each of the 20 Young Lives sites. School level data analysis (for example descriptive analysis relating to school facilities or head teachers) has not had weights applied. This means that these analyses relate only to the 205 schools included in the survey, rather than being generalisable to the wider population of schools in these sites.

As sections which were suspected of mass scale assistance have been dropped from all analysis of test data, these sections were excluded from the calculation of the sample weights, that is, from the calculation of the total number of students enrolled in that school type within the sites. This means that there are subject-specific sample weights which have been applied for analysis of the test data. When excluding these sections from the sample in analysis of the test data, the revised weights for school types become higher as the schools remaining in the sample estimation accounted for more students in the population.

In cases where the number of sampled students (*n*) is larger than the population size (*N*) (i.e. the survey data reports that there are more students enrolled than DISE information suggests), we cap the weight as 1 (e.g. the sample is 100 per cent of the population). The weights can be checked through multiplying the total sample for a site by the weights for each school type – this should always equal the population total for that site.

3.3   IRT scaling procedures (maths, English, transferable skills)

As described briefly in Section 1.4, data from tests in maths, English and transferable skills presented in this report have been scaled using psychometric procedures based on 'item response theory' (IRT) in order to provide interval-scaled measures of the relevant latent traits, that is the underlying skill proficiencies being examined by each test.[29] Below we provide a non-technical summary of the approach taken to IRT scaling of the data.

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28 DISE captures the number of students enrolled in schools across all districts in India.

29 See Van der Linden et al. (2013) for detailed descriptions of these procedures.

In the case of the maths and English tests, each item follows a multiple choice format with a single correct answer, so that each item score is dichotomous, being either correct or incorrect. In the transferable skills test, some questions permit 'partial credit' scoring so that answers may be scored 0 (incorrect), 1 (partially correct), or 2 (correct). The latent trait modelling approach employed in all cases is the 2-parameter IRT model, usually for dichotomous responses, extended in the case of the transferable skills test for polytomous responses by use of a 'generalised partial credit' IRT model. These models were implemented using the IRT suite of commands in STATA 14.

The two parameter model simultaneously estimates two item parameters (difficulty and discrimination) and a single person parameter (ability). The difficulty parameter simply describes the probability that an item is answered correctly based on the response pattern among the sample of test-takers, while the discrimination parameter describes the rate at which the probability of answering an item correctly changes with pupil ability. Accordingly the discrimination parameter is given by the slope of the item characteristic curve in Figure 17. An item characteristic curve represents the relationship between a latent trait (ability) and performance on an individual test item. In this example, a pupil with the mean level of ability (a value of zero on the mean-centred scale below) has a 50 per cent probability of answering this item correctly. In turn, the difficulty parameter is zero (the item is at the mean level of difficulty). The ability axis scale measures both 'item difficulty' and 'pupil ability' in logits (log odds units), a log-transformed probability measure whereby one logit is the distance along the axis (increase in the value of the latent trait) which increases the odds of a correct answer by a factor of 2.718 (the base value of the natural logarithm).

Figure 17. *Example item characteristic curve*
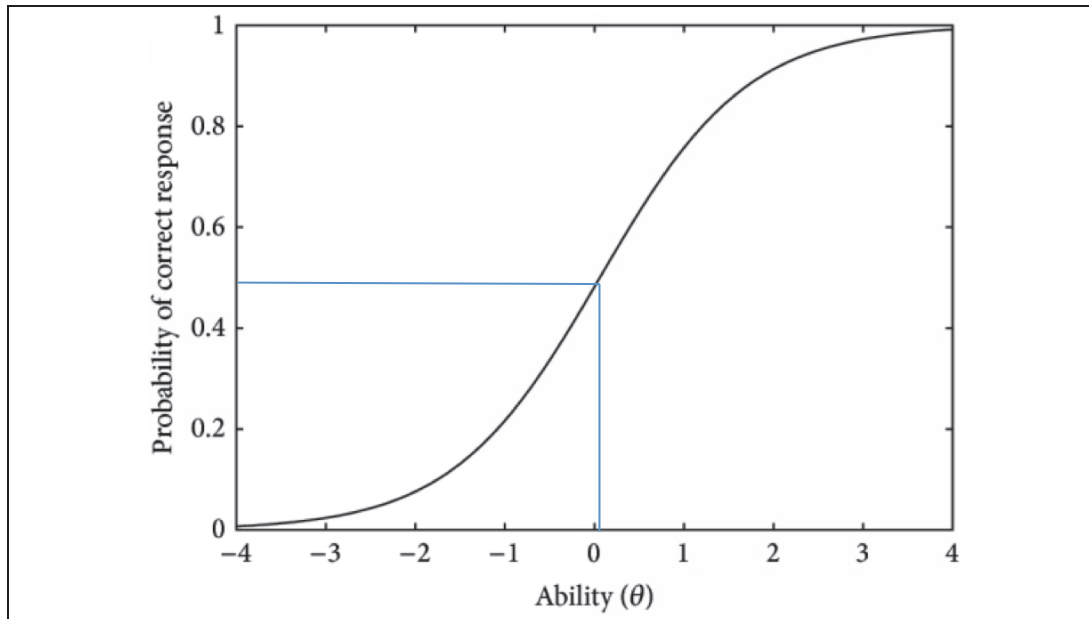
In maths and English, two sets of tests were administered, with a sub-set of items being common to both tests (anchor or link items). As a result, we are able to employ 'concurrent calibration' across items from both tests to estimate latent trait values for each student separately at the earlier and later time points during the school year, on a common interval scale (known as vertical scaling). This method includes all items administered across both tests and effectively includes each individual twice – first as a Wave 1 test-taker and second

as a Wave 2 test-taker. This approach provides two ability estimates for each pupil, which allows calculation of 'progress made' between the two tests by simple subtraction of the earlier score from the later score.

As seen above, estimates of latent traits (proficiencies) from IRT models are outputted in the form of variables centred on zero reported in logits. Since the logit scale is an interval scale these values may be transformed onto any other interval scale while retaining the same properties. They are re-scaled for this report in order to aid interpretation, specifically to avoid negative proficiency scores and to ensure that all scores may be readily compared in standard deviation terms. In common with the approach of international studies such as PISA and TIMSS, we choose to rescale these variables to have a mean of 500 and a standard deviation of 100 for the Wave 1 data, and for all data from the transferable skills tests, which are administered only once. Data from Wave 2 tests are transformed specifically onto the Wave 1 scale. Accordingly, the Wave 2 scores can be readily interpreted by comparison with Wave 1 scores (in terms of progress). The formulae used are shown below:

T1: Ability parameter (logit scale) wave 1

T2: Ability parameter (logit scale) wave 2

M1: Mean of T1

SD1: Standard Deviation of T1

Scaled Test Score wave 1= ((100/SD1)*T1)-((100/SD1)*M1)+500

Scaled Test Score wave 2= ((100/SD1)*T2)-((100/SD1)*M1)+500

The design of multiple choice items included attention to the selection of 'distractor' options, that is alternatives to the correct answer which are designed to reflect common misunderstandings of the concept in question or weak understanding of the concept. According to this approach, it is expected that students with weaker understanding will select distractor options somewhat more often than adopting an approach of random 'guessing'. For this reason we chose not to include a third parameter, known as the 'pseudo-guessing parameter' which is employed in some other studies (the 3-parameter IRT model). This parameter is intended to account for the non-zero probability that a very low proficiency student will select the correct answer to a multiple choice question by guessing and is defined as the lower asymptote of the item response function.

3.4   Pilot procedures

Test items and background questionnaires were pre-piloted and piloted in February and March 2016 (for Wave 1 instruments) and October 2016 (for Wave 2 instruments). Qualitative pre-piloting aimed to check the suitability of test items and questionnaire content, and to identify any issues with translation. Following revisions to instruments based on student and teacher feedback, a larger scale pilot was then conducted.

The pilot sample was drawn from different types of schools, different regions and localities. The aim was not for the pilot sample to be representative of the full sample, but rather for selected schools and students to reach the extremes of expected performance in each subject to identify potential floor and ceiling effects.

The Wave 1 pilot sample consisted of 593 students attending 12 schools of different types: State Government schools, Private Unaided schools and Tribal/Social Welfare schools. The

schools were located in a mixture of rural and urban areas in two districts in Andhra Pradesh: Kurnool and West Godavari.

The Wave 2 pilot sample consisted of 219 students attending four schools of different types: State Government schools and Private Unaided schools. The schools were located in a mixture of rural and urban areas in two districts of Telangana: Hyderabad and Nalgonda. An additional 15 teachers also took part in a workshop to give feedback on the teacher instruments. The pilot testing was undertaken using bilingual instruments, with each item presented in both English and Telugu. A smaller qualitative pilot was also undertaken with Urdu medium students at a later date, using a bilingual form with each item presented in both English and Urdu.

Following pilot testing, pilot data was analysed to generate a range of statistics, and qualitative feedback was collated and reviewed. Each part of the tests, background questionnaires and psychosocial scales were considered, and revised or removed if necessary. Telugu and Urdu translations were also checked and revised if required.[30]

3.5   Description of the Young Lives sites in India

This survey has been undertaken in a sample of schools within the 20 Young Lives sites in AP and Telangana. While the identities of these sites are anonymised, Table 24 provides a short description of each.

Table 24.   *Young Lives sites*

District	Site ID	Short description
West Godavari	WG1	An urban area in a well-developed coastal region.
	WG2	A tribal mandal in a well-developed coastal district.
Srikakulam	SR1	A town in north coastal Andhra Pradesh.
	SR2	A tribal mandal in the north coastal district.
	SR3	A rural mandal in north coastal Andhra.
	SR4	A rural mandal in north coastal Andhra.
	SR5	A rural mandal with a mix of tribes and non-tribes in north coastal Andhra.
Kadapa	KD1	A rural mandal in the heart of the Rayalaseema region where agriculture is the main occupation.
	KD2	A remote rural mandal in a forested part of the Rayalaseema region.
Anantapur	AN1	An urban site in the Rayalaseema region, which is a district headquarter.
	AN2	A poor rural mandal in Rayalaseema region affected by Naxalite movements.
	AN3	A poor rural area spread across hilly areas and affected by Naxalite movements.
	AN4	A rural mandal in the Rayalaseema region bordering the neighbouring state.
Karimnagar	KR1	A medium-sized town in northern Telangana with people of mixed religion.
	KR2	A rural area in northern Telangana affected by Naxalite movements.
Mahabubnagar	MB1	A rural tribal mandal lying in the forest areas of southern Telangana.
	MB2	A rural mandal in the southern Telangana region with people moving in seasonal migration.
	MB3	A rural mandal in the southern Telangana region with a high incidence of child labour and seasonal migration.
	MB4	A very poor mandal in southern Telangana.
Hyderabad	HD	A densely crowded area in Hyderabad, the capital of Telangana.

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30 See Azubuike et al. (2017); Iyer and Azubuike (forthcoming); Moore and Rossiter (forthcoming) for further information on piloting procedures for the different instruments.

3.7   Survey administration

Each wave of the school survey was conducted by trained fieldworkers working in district teams led by a supervisor from the Centre for Economic and Social Studies (CESS), Hyderabad. Prior to each wave of data collection, fieldworkers received four or five days of training on the instruments which would be used, including one day spent in field-based practice of the instruments in local schools. Training was jointly delivered by team members from CESS and Young Lives, Oxford.

In Wave 1 of the survey, each fieldwork team spent one day in each school, with the exception of the small number of larger schools which had more than three Class 9 sections. Fieldwork began at the beginning of July 2016, and was completed by mid-August.

In Wave 2, each fieldwork team spent two days in each school, with the exception of schools with more than three Class 9 sections. The additional time per school was required as Wave 2 included four student instruments (three tests plus the student background questionnaire), and it was felt that students should not be asked to complete more than two tests in one day due to the risk of fatigue. Fieldwork began in the last week of January 2017, and was completed by the first week of March. Additional fieldworkers were recruited and trained for Wave 2 to ensure that data collection was completed within the required time period (before the end of year exams began).

Data entry took place at CESS. Data entry for the maths and English tests used an online system developed by Educational Initiatives, which allowed various quality assurance checks to be made on the data during and after data entry. Data entry for the other survey instruments was completed offline, with quality control checks and data cleaning completed manually once data had been entered.

CESS led the survey administration, including securing permission to visit schools, making training arrangements, dealing with all aspects of fieldwork logistics, and managing data entry.

3.8   Development of composite variables, e.g. student home assets

In order to estimate the socio-economic status of the students in this sample, data on assets and household consumer durables was collected for each respondent.[31] A composite score using Principal Component Analysis (PCA) was employed to estimate a proxy to measure background/wealth advantage of students. The PCA is a technique used to reduce the number of variables in a data set into a smaller number of dimensions. It creates indices or components from a data set, where each component is a linear weighted combination of the initial variables. The asset variables in PCA are weighted by how much variation exists between variables. The assets that are more unequally distributed between households are given more weight in a PCA (Vyas and Kumaranayake 2006). After estimating the principal components of the assets data, a score is predicted that gives the wealth index for each child based on the variables included in the PCA, with higher values of the wealth index indicating more wealth advantage.

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31 The following consumer durables were included in the questionnaire; bicycle, motorbike/scooter, television, electric fan, chair, table, mobile phone, fridge, car/truck, air-conditioning, computer/laptop and internet in the home.

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4. Appendices

4.1 Attrition between rounds

At Wave 1, the survey sample included all students in Class 9 in the sampled schools who were present on the day of the survey visit. In Wave 2, the sample included all students who had participated in Wave 1 who were present on the day of the survey visit. The final school survey sample includes only those 8,355 students who were present in Wave 1 and Wave 2. The average rate of attrition between Wave 1 and Wave 2 was 15 per cent, although this varied across districts as shown in Table 25.

Table 25. *Student sample and instrument completion, by district and survey wave*

District	Wave 1		Wave 2		Rate of attrition between Wave 1 and Wave 2 (district average)
	All students enrolled in Class 9 in sampled schools at time of Wave 1 survey	**Students included in Wave 1 survey**	**Surveyed students still enrolled at Wave 2**	**Surveyed students included in Wave 2 ***	
West Godavari sites	1923	1614	1486	1395	14%
Srikakulam sites	3345	2962	2794	2540	14%
Kadapa sites	360	303	278	253	17%
Anantapur sites	1952	1660	1505	1360	18%
Karimnagar sites	1062	900	890	798	11%
Mahbubnagar sites	1475	1169	1134	993	15%
Hyderabad site	1517	1212	1125	1016	16%
Total	11634	9820	9212	8355	15%

Notes: * Those students who participated in the survey at both Wave 1 and Wave 2.

4.2 State-wise report tables (Andhra Pradesh)

Table 26. *School, section and teacher sample (AP)*

Number of Young Lives sites	School types					Class 9 sections	Class 9 teachers	
	Private Aided	**Private Unaided**	**State Government**	**Tribal/Social Welfare**	**Total**		**Maths**	**English**
13	15	24	53	29	121	197	170	146

Table 27. *Student sample and instrument completion, by survey wave (AP)*

Wave 1		Wave 2		Rate of attrition between Wave 1 and Wave 2 (state average)
All students enrolled in Class 9 at time of Wave 1 survey	**Students included in Wave 1 survey**	**Surveyed students still enrolled at Wave 2**	**Surveyed students included in Wave 2 ***	
7580	6539	6063	5548	16%

Notes: * Students who participated in the survey at both Wave 1 and Wave 2.

Table 28. *Percentage of schools and students, by school type (AP)*

School type	Schools in the sample (%)
Private Aided	12
Private Unaided	20
State Government	44
Tribal/Social Welfare	24
Total	**100**

Table 29. *School locality, by school type (AP)*

Locality	Private Aided (%)	Private Unaided (%)	State Government (%)	Tribal/Social Welfare (%)	Sample mean (%)
Rural	7	46	91	100	74
Urban	93	54	9	0	26
Total	**100**	**100**	**100**	**100**	**100**

Table 30. *School grades, by school type (AP)*

Grades covered	Private Aided (%)	Private Unaided (%)	State Government (%)	Tribal/Social Welfare (%)	Sample mean (%)
Class 6-10	80	33	94	3	59
KG-Class 10	0	42	0	0	8
Class 1-10	7	21	0	0	5
Class 3-10	0	0	0	62	15
Class 5-10	7	0	4	17	7
Class 5-12	0	0	0	7	2
Other grade combinations	7	4	2	10	5
Total	**100**	**100**	**100**	**100**	**100**

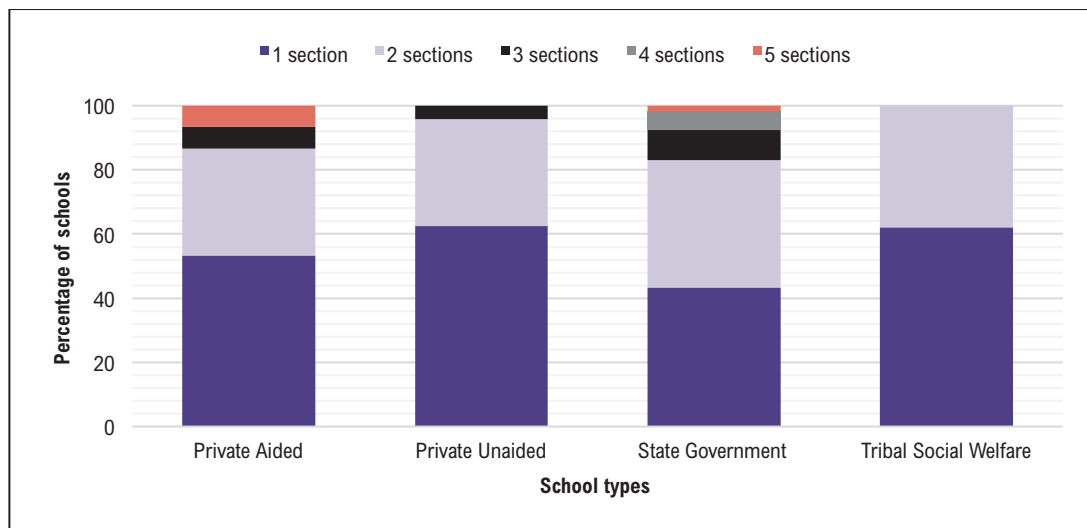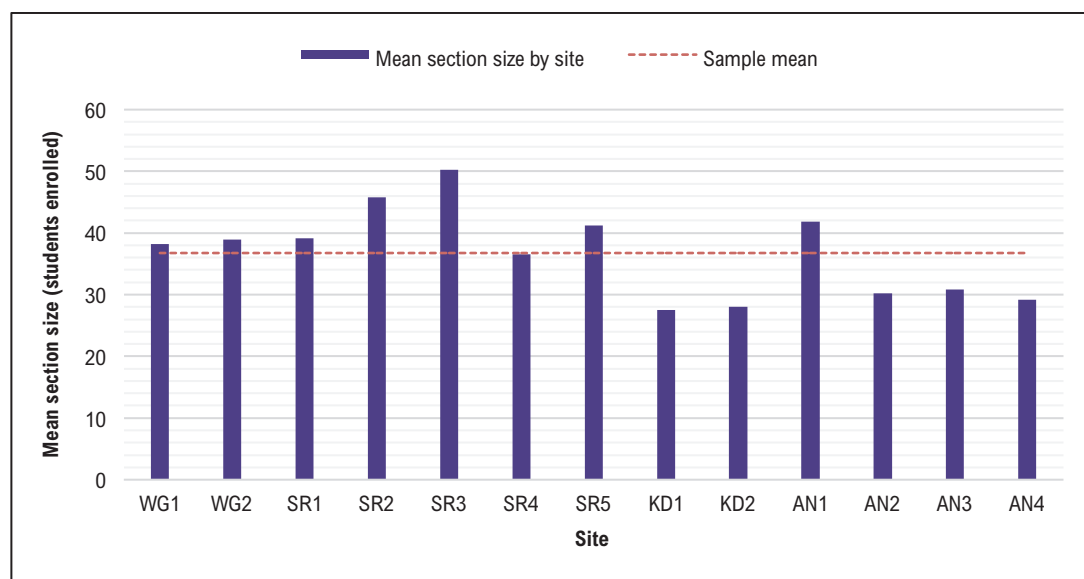**Figure 17.** *Number of sections in Class 9, by school type (AP)*

Figure 18. *Mean section size, by Young Lives site (AP)*

Notes: Mean section size refers to the number of students enrolled in the section at the point when the Wave 1 survey took place.

Table 31. *Selected school facilities, by school type (AP)*

Type of school	% of schools where each Class 9 section has their own classroom	% of schools where teaching was observed taking place in open space *	% of schools where there is some kind of outside space **	% of schools in need of major repairs ***	% of school compounds with electricity	% of schools with functional internet access	% of schools with at least one functional computer available for student use
Private Aided	100	7	93	13	100	67	67
Private Unaided	100	13	79	8	96	83	79
State Government	85	26	92	36	98	42	70
Tribal/Social Welfare	97	0	100	31	100	62	59
Sample mean	**93**	**15**	**92**	**26**	**98**	**58**	**69**

Notes: * These figures collate teaching in open space (no cover) teaching in open space (partial cover). ** These figures collate schools with outside space which is sufficient for assembly only, and those with sufficient outside space for sports or games. *** Major repairs mean that the physical structure of the building is poor enough to affect teaching and learning, e.g. a leaking roof or missing wall. It does not include minor repairs such as painting.

Table 32. *School medium of instruction, by school type (AP)*

School medium of instruction	Private Aided (%)	Private Unaided (%)	State Government (%)	Tribal/Social Welfare (%)	Sample mean (%)
Telugu only	80	0	34	69	41
English only	13	96	13	31	34
English and Telugu	7	4	49	0	23
Other	0	0	4	0	2
Total	**100**	**100**	**100**	**100**	**100**

Figure 19. *Mean minutes of lesson time per week, by subject and school type (AP)*
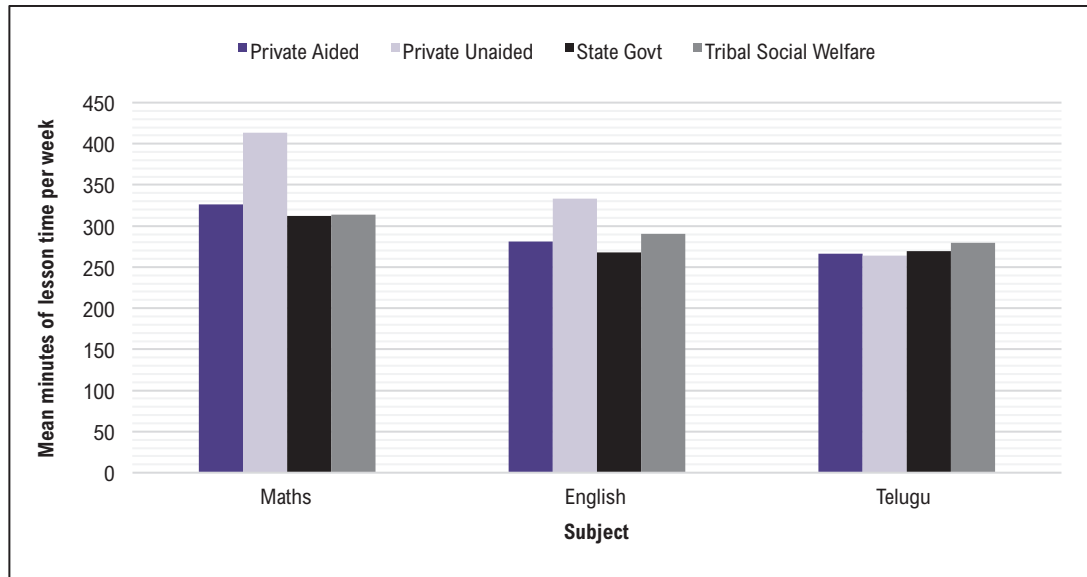

Table 33. *Head teacher characteristics, by school type (AP)*

School type	Mean age of head teacher	Male head teacher (%)	Mean years of experience as a head teacher	Head teacher has a B.Ed degree or higher (%)	Head teacher has current teaching responsibilities (%)
Private Aided	57	47	6	100	87
Private Unaided	45	75	9	92	79
State Government	48	68	3	98	92
Tribal/Social Welfare	51	69	2	97	86
Sample mean	**49**	**67**	**4**	**97**	**88**

Table 34. *Head teacher place of birth and current place of residence, by school type and locality (AP)*

School type	Head teacher is originally from this village or town (%)	Head teacher currently lives in this village or town (%)
Private Aided	53	93
Private Unaided	63	83
State Government	26	26
Tribal/Social Welfare	24	52
Urban	27	40
Rural	63	84
Sample mean	**36**	**52**

Table 35. *Selected teacher characteristics, by school type (AP)*

School type	Mean teacher age	Male teachers (%)	Mean years of experience as a teacher	Teacher has a B.Ed degree or higher (%)	Teacher has permanent contract (%)
Private Aided	47	44	18	93	67
Private Unaided	36	63	10	72	29
State Government	43	65	14	86	84
Tribal/Social Welfare	37	43	10	85	65
Sample mean	**41**	**57**	**13**	**84**	**67**

Table 36. *Teacher place of birth and current place of residence, by school type and locality (AP)*

School type	Teacher is originally from this village or town (%)	Teacher currently lives in this village or town (%)
Private Aided	49	82
Private Unaided	28	58
State Government	13	30
Tribal/Social Welfare	5	32
Rural	11	25
Urban	36	80
Sample mean	**18**	**42**

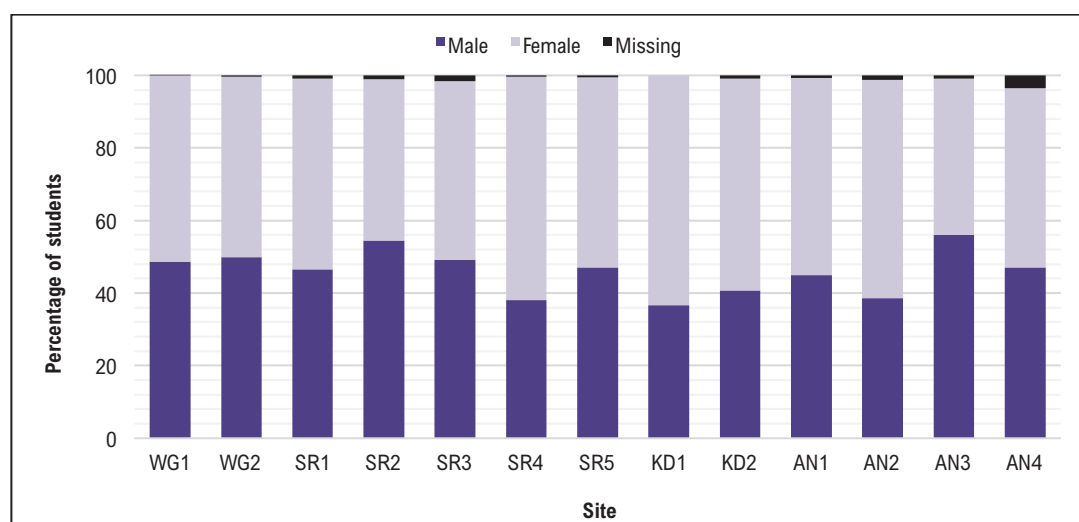**Figure 20.** *Student gender, by site (AP)*

Table 37. *Student background (AP)*

Students who have lost at least one parent (%)	Students who report having no books at home (%) *	Students who report spending some time on the following activities on a usual school day **		
		Working on the farm or family business (%)	Chores or caring for family members (%)	Working for pay (%)
8	21	17	51	6

Notes: * Excluding school textbooks. ** The questionnaire asked students to specify the amount of time they spent working on these different tasks, from none to more than three hours. The data in this table collates all responses from less than one hour to more than three hours (e.g. excluding anyone who reported they spend no time on an activity).

Table 38. *Selection student characteristics, by school type (AP)*

School type	Male (%)	Mean student age (years)	Percentage of students from the most disadvantaged tercile in this school type	Social category (%)				Parental literacy (%)	
				SC	ST	OBC	GC	Neither parent can read	Both parents can read
Private Aided	29	14	21	31	2	53	14	9	71
Private Unaided	54	14	5	6	1	57	36	5	82
State Government	41	14	38	16	4	72	8	19	55
Tribal/Social Welfare	43	14	55	14	83	2	1	26	51
Sample mean	**47**	**141**	**.**	**12**	**10**	**58**	**21**	**12**	**68**

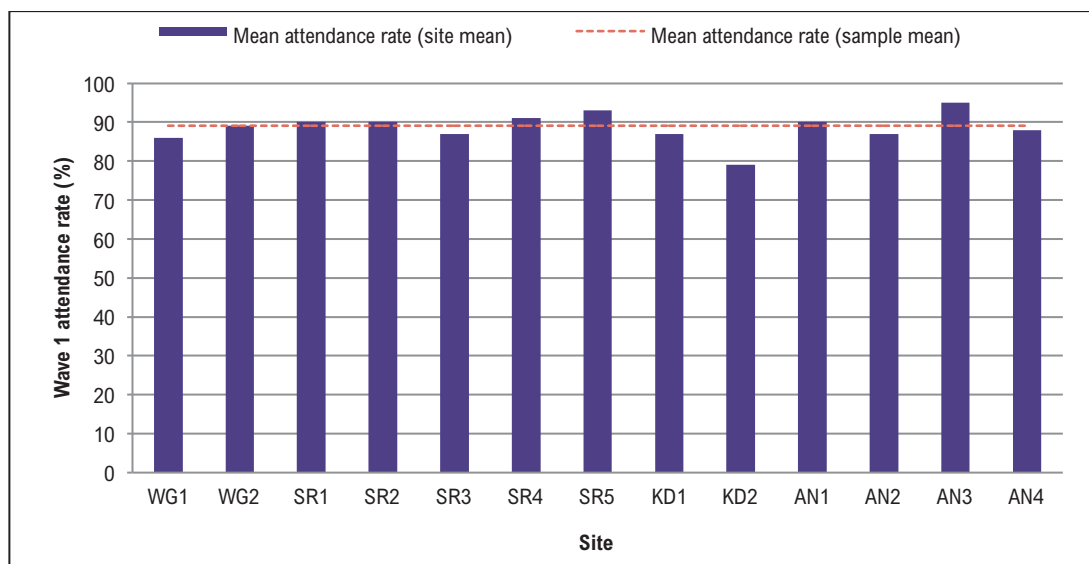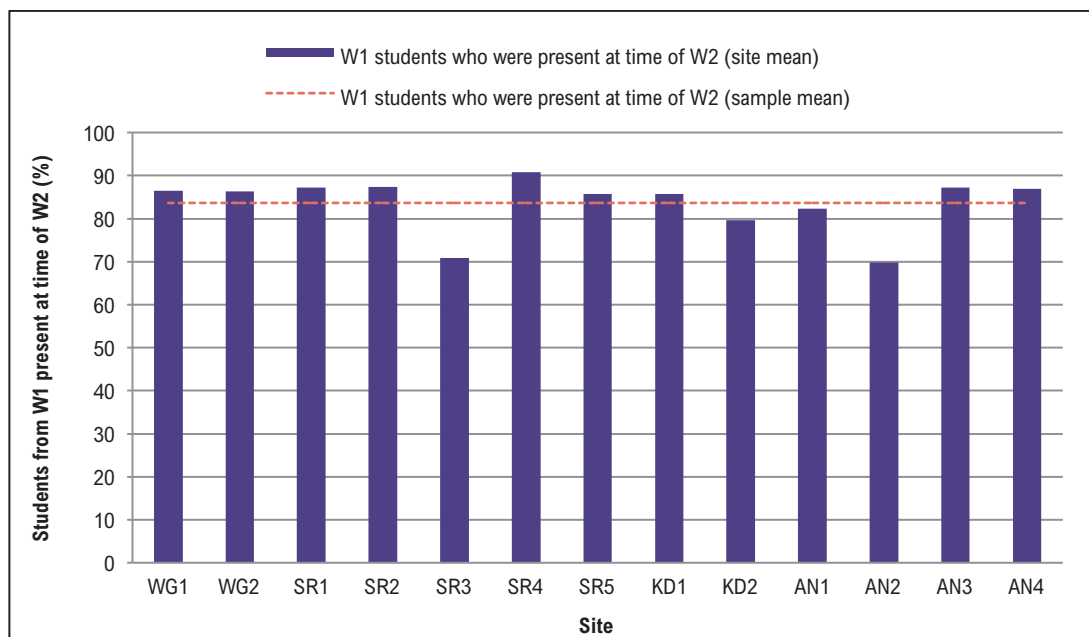**Figure 21.** *Wave 1 student attendance rate, by site (AP)*

Figure 22. *Rate of attendance of Wave 1 students at Wave 2 (AP)*

Notes: This includes students listed as no longer enrolled at the school.

Table 39.   *Student first language (AP)*

Students' mother tongue (where >1%)					
Telugu (%)	**Urdu (%)**	**Oriya (%)**	**Kannada (%)**	**Other (%)**	**Total (%)**
84	6	1	3	4	100

Table 40.   *Language of instruction, by school type (AP)*

Students in each school type whose medium of instruction is the same as the language they mostly speak at home (%)				
Private Aided	**Private Unaided**	**State Government**	**Tribal/Social Welfare**	**Sample mean**
66	1	57	31	29

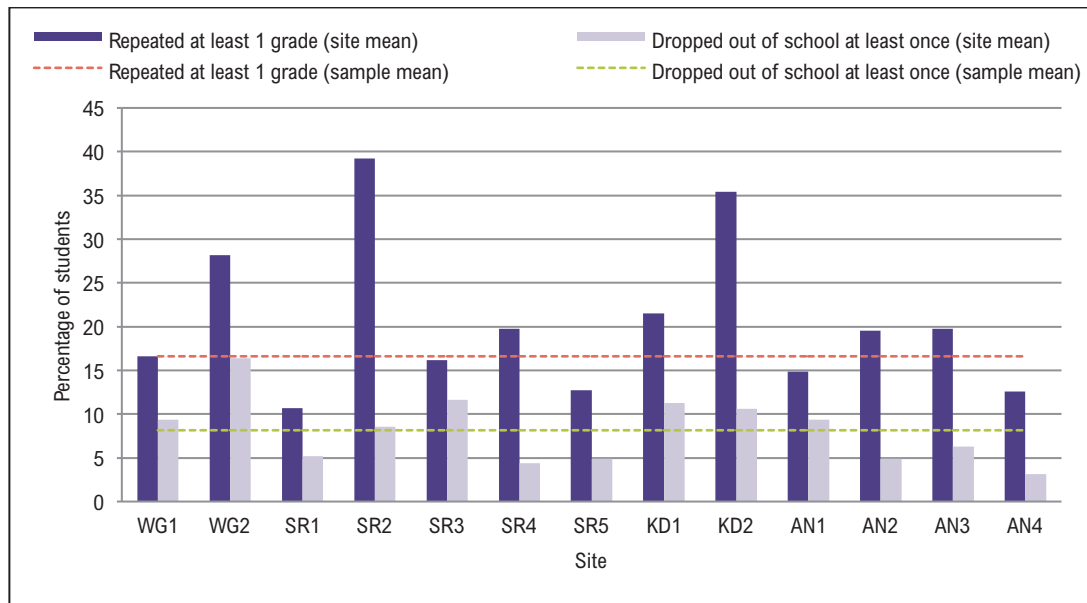**Figure 23.**   *Incidence of grade repetition and dropout, by site (AP)*

Table 41.   *Grade repetition and dropout, by school type (AP)*

School type	Grade repetition				Dropped out of school at least once
	Never repeated a grade (%)	**Reported repeating one grade (%)**	**Reported repeating more than one grade (%)**	**Have repeated at least one grade at secondary level (%)**	
Private Aided	82	16	2	2	6
Private Unaided	90	9	1	1	8
State Government	80	18	2	1	8
Tribal/Social Welfare	68	28	5	5	10
Sample mean	**83**	**15**	**2**	**1**	**8**

Table 42.   *Student experiences of homework (AP)*

School type	Maths homework is given more than three times per week	Maths homework is always marked	English homework is given more than three times per week	English homework is always marked
Private Aided	39	38	34	38
Private Unaided	42	49	22	41
State Government	51	34	35	34
Tribal/Social Welfare	49	39	38	39
Sample mean	**46**	**42**	**29**	**38**

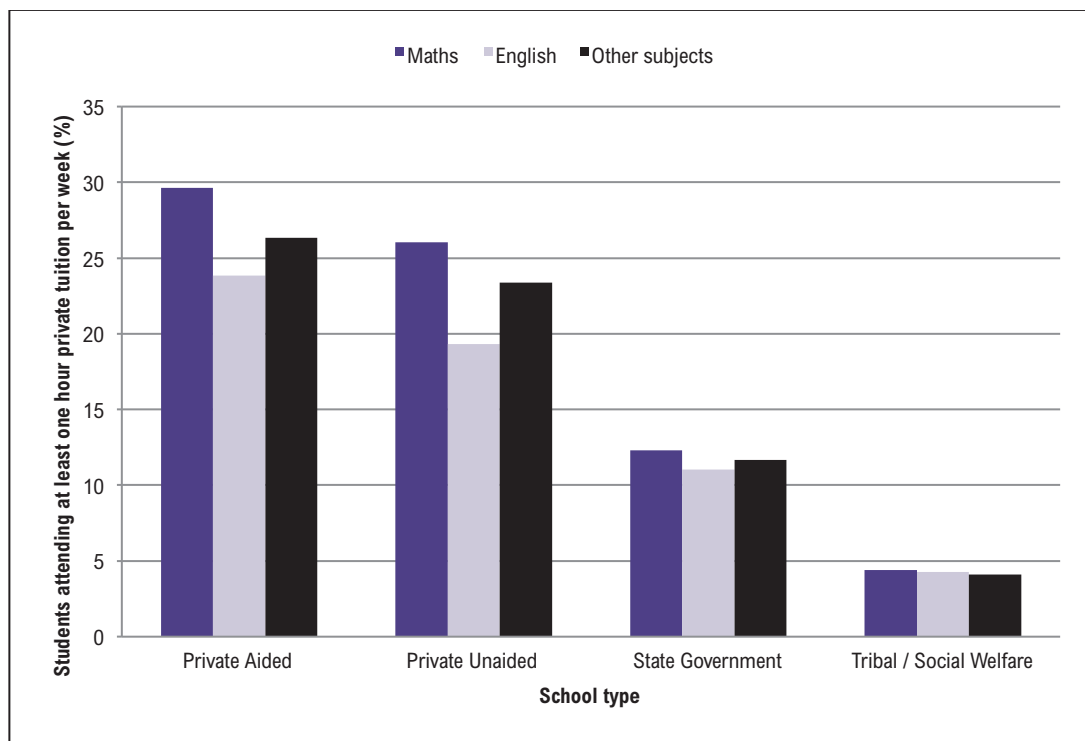**Figure 24.**   *Students attending private tuition, by school type (AP)*

Table 43.   *Student exposure to English outside school, by school type (AP)*

School type	Started learning English in Class 3 or earlier (%)	Student has the opportunity to practice speaking English to these people (%) *				Student has the opportunity to practice English in these ways (%) *	
		Mother	Father	Siblings	Friends	Read books, magazines or newspapers in English	Watch TV or movies in English
Private Aided	74	39	41	67	77	86	82
Private Unaided	78	38	43	71	87	94	91
State Government	78	14	17	52	68	83	75
Tribal/Social Welfare	61	10	14	41	66	85	82
Sample mean	**76**	**26**	**30**	**60**	**77**	**88**	**83**

Notes: * This includes students who reported that they have the opportunity to do this occasionally or often (e.g. it excludes anyone who said they never have the opportunity to do this, or that it is not applicable).

Figure 25. *Student use of a computer, by school type (AP)*
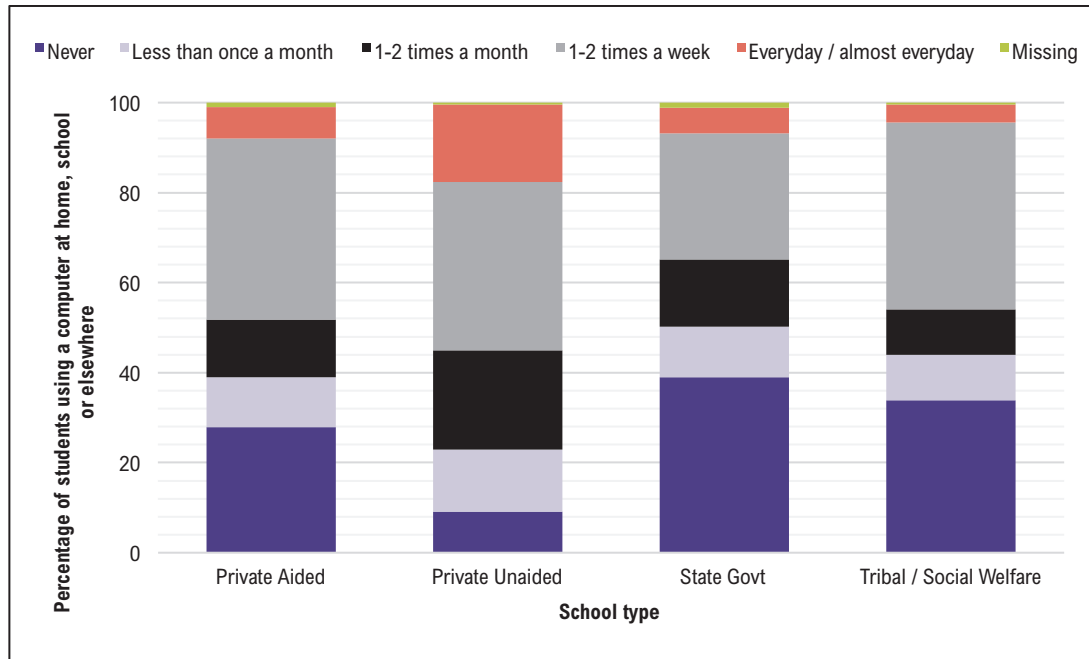
Notes: This collates student responses about their frequency of use of a computer at home, at school and in any other place.

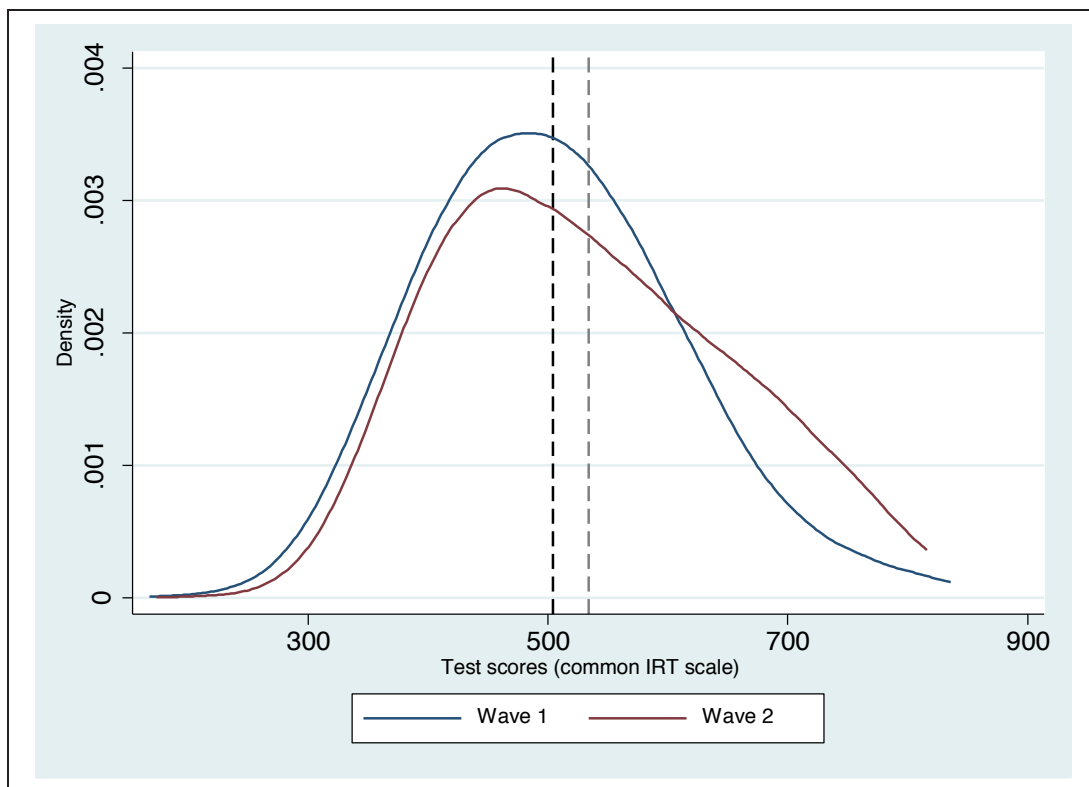**Figure 26.** *Wave 1 and Wave 2 maths performance (AP)*

Table 44. *Wave 1 and Wave 2 maths performance (AP)*

	By school type				By locality		By gender		Sample mean
	Private Aided	Private Unaided	State Government	Tribal/ Social Welfare	Rural	Urban	Male	Female	
Maths Wave 1 test score	455	548	475	410	485	518	522	489	504
Maths Wave 2 test score	476	593	487	437	509	553	548	522	534
Mean W1-W2 learning gain	21***	45***	12***	28***	24***	35***	27***	33***	30***

Notes: ***T-test of the difference in means is significant at the 1% level.
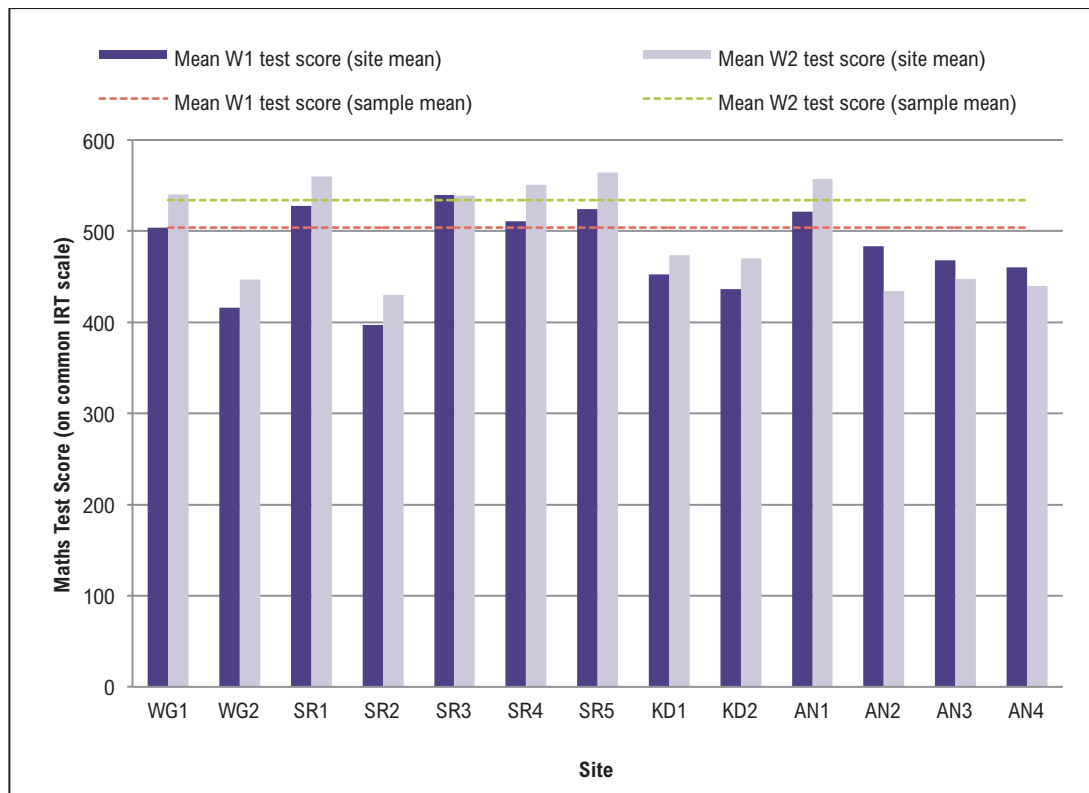
Figure 27. *Wave 1 and Wave 2 maths performance (AP)*
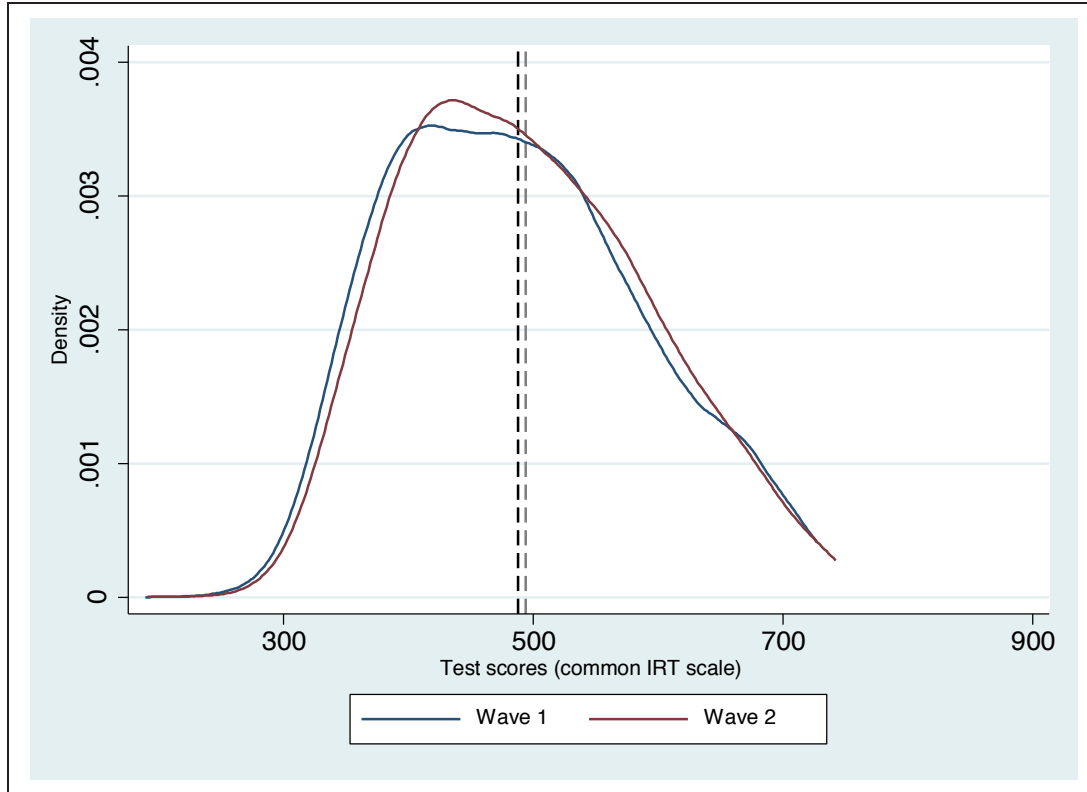
Figure 28. *Wave 1 and Wave 2 English performance (AP)*

Table 45. *Wave 1 English performance (AP)*

	By school type				By locality		By gender		Sample mean
	Private Aided	Private Unaided	State Government	Tribal/ Social Welfare	Rural	Urban	Male	Female	
English Wave 1 test score	435	553	432	396	446	522	500	479	488
English Wave 2 test score	448	560	431	415	451	528	501	489	494
Mean W1-W2 learning gain	14***	7***	-1	19***	5***	7***	1***	10***	6***

Notes: ***T-test of the difference in means is significant at the 1% level.

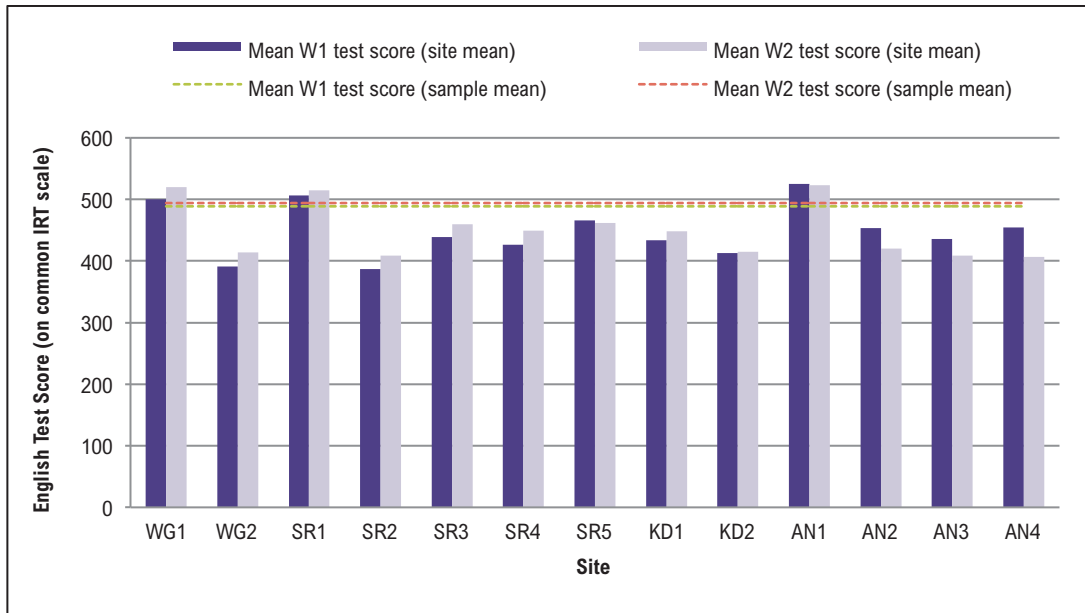**Figure 29.** *Wave 1 and Wave 2 English performance (AP)*
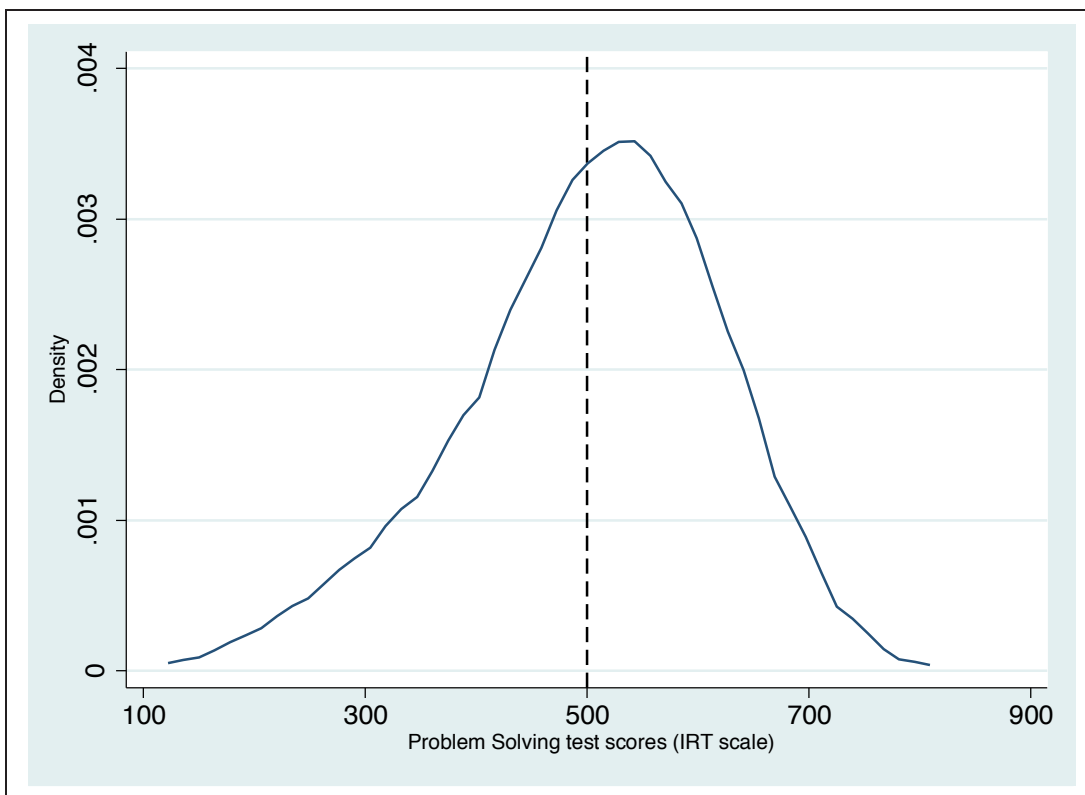

Figure 30. *Problem solving performance (AP)*

Figure 31. *Critical thinking performance (AP)*
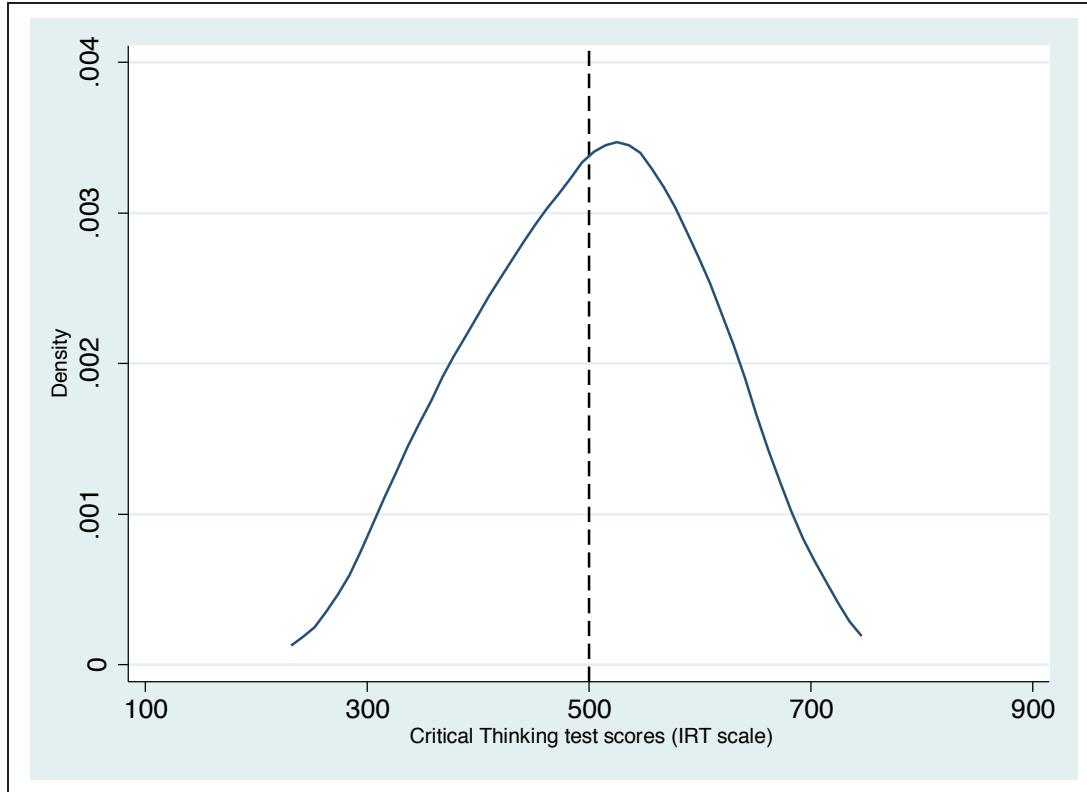
Table 46. *Transferable skills performance (AP)*

	By school type				By locality		By gender		Sample mean
	Private Aided	Private Unaided	State Government	Tribal/ Social Welfare	Rural	Urban	Male	Female	
Problem solving test score	464	532	480	454	484	516	501	504	503
Critical thinking test score	464	533	477	447	488	510	502	501	501

Figure 32. *Problem solving and critical thinking test scores, by site (AP)*
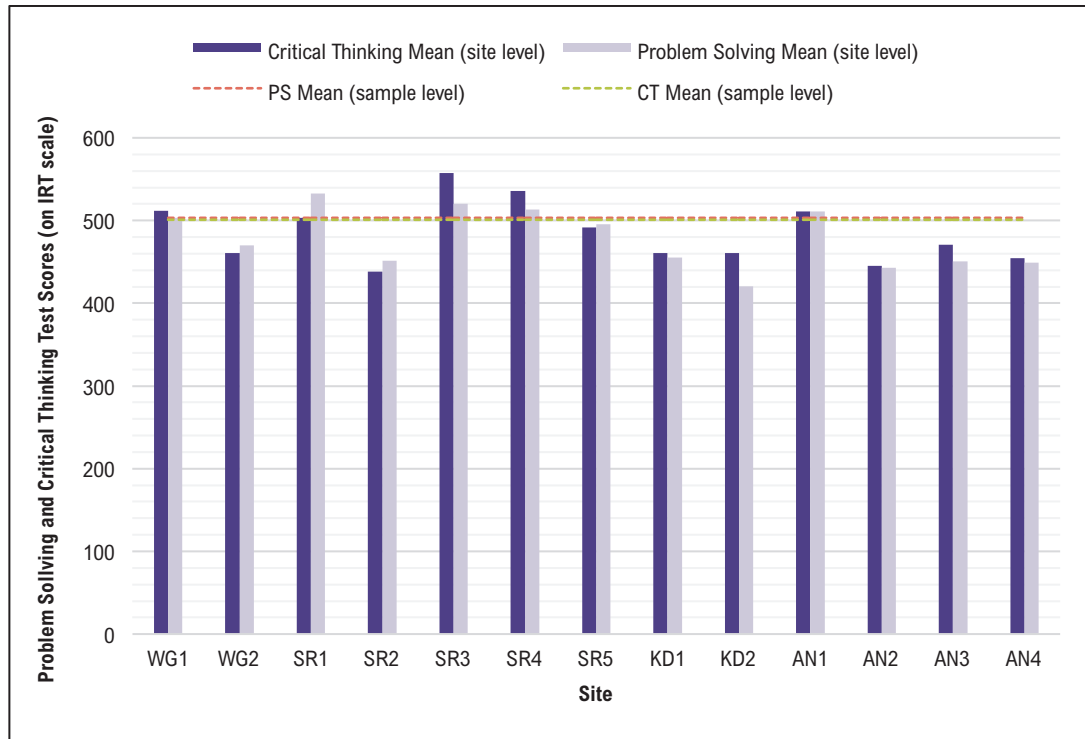
4.3 State-wise report tables (Telangana)

Table 47. *School, section and teacher sample (Telangana)*

Number of Young Lives sites	School types					Class 9 sections	Class 9 teachers	
	Private Aided	Private Unaided	State Government	Tribal/ Social Welfare	Total schools		Maths	English
7	14	31	32	7	84	120	103	100

Table 48. *Student sample and instrument completion, by district and survey wave (Telangana)*

Wave 1		Wave 2		Rate of attrition between Wave 1 and Wave 2 (state average)
All students enrolled in Class 9 at time of Wave 1 survey	Students included in Wave 1 survey	Surveyed students still enrolled at Wave 2	Surveyed students included in Wave 2 *	
4054	3281	3149	2807	14%

Notes: * This number is those students who participated in the survey at both Wave 1 and Wave 2.

Table 49. *Percentage of schools and students, by school type (Telangana)*

School type	Schools in the sample (%)
Private Aided	14
Private Unaided	38
State Government	40
Tribal/Social Welfare	9
Total	**100**

Table 50. *School locality, by school type (Telangana)*

Locality	Private Aided (%)	Private Unaided (%)	State Government (%)	Tribal/Social Welfare (%)	Sample mean (%)
Rural	9	29	81	100	53
Urban	91	71	19	0	47
Total	**100**	**100**	**100**	**100**	**100**

Table 51. *School grades, by school type (Telangana)*

Grades covered	Private Aided (%)	Private Unaided (%)	State Government (%)	Tribal/Social Welfare (%)	Sample mean (%)
Class 6-10	14	0	97	0	39
KG-Class 10	14	65	0	0	26
Class 1-10	64	32	0	0	23
Class 3-10	0	0	0	43	4
Class 5-10	0	0	3	14	2
Class 5-12	0	0	0	29	2
Other grade combinations	7	3	0	14	4
Total	**100**	**100**	**100**	**100**	**100**

Figure 33. *Number of sections in Class 9, by school type (Telangana)*
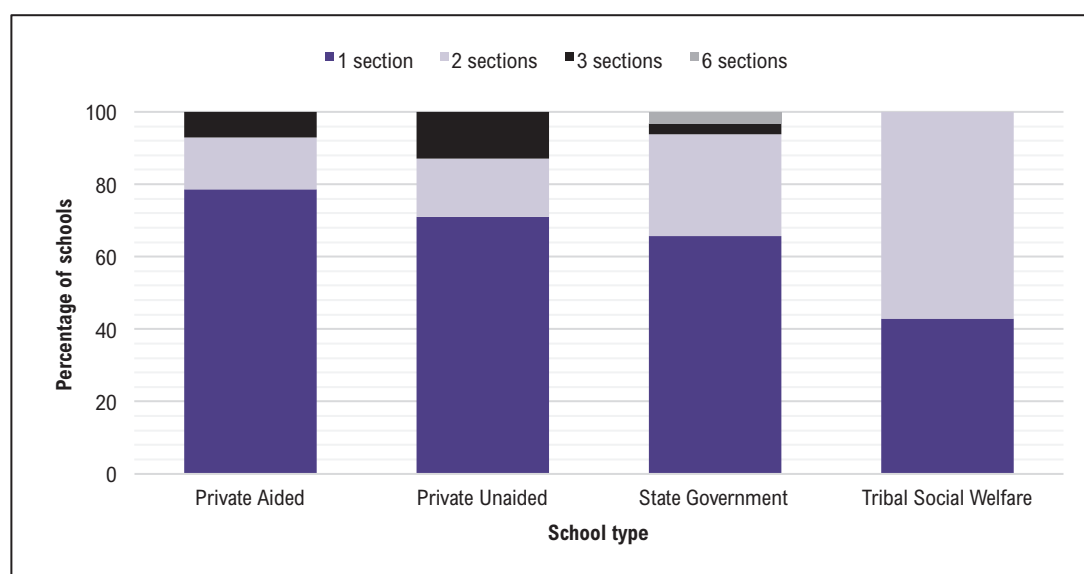
Figure 34. *Mean section size, by Young Lives site (Telangana)*

Notes: Mean section size refers to the number of students enrolled in the section at the point when the Wave 1 survey took place.

Table 52. *Selected school facilities, by school type (Telangana)*

Type of school	% of schools where teaching was observed taking place in open space *	% of schools where there is some kind of outside space **	% of schools in need of major repairs ***	% of schools in need of major repairs	% of school compounds with electricity	% of schools with functional internet access	% of schools with at least one functional computer available for student use
Private Aided	86	0	79	36	100	57	57
Private Unaided	97	13	48	6	100	71	81
State Government	100	3	78	25	100	53	44
Tribal/Social Welfare	100	0	57	43	100	57	43
Sample mean	96	6	65	21	100	61	60

Notes: * These figures collate teaching in open space (no cover) teaching in open space (partial cover). ** These figures collate schools with outside space which is sufficient for assembly only, and those with sufficient outside space for sports or games. *** Major repairs mean that the physical structure of the building is poor enough to affect teaching and learning, e.g. a leaking roof or missing wall. It does not include minor repairs such as painting.

Table 53. *School medium of instruction, by school type (Telangana)*

School medium of instruction	Private Aided (%)	Private Unaided (%)	State Government (%)	Tribal/Social Welfare (%)	Sample mean (%)
Telugu only	43	6	72	43	40
English only	36	87	0	57	43
English and Telugu	0	0	25	0	10
Urdu	22	3	3	0	6
Other	0	3	0	0	1
Total	**100**	**100**	**100**	**100**	**100**

Figure 35. *Mean minutes of lesson time per week, by subject and school type (Telangana)*
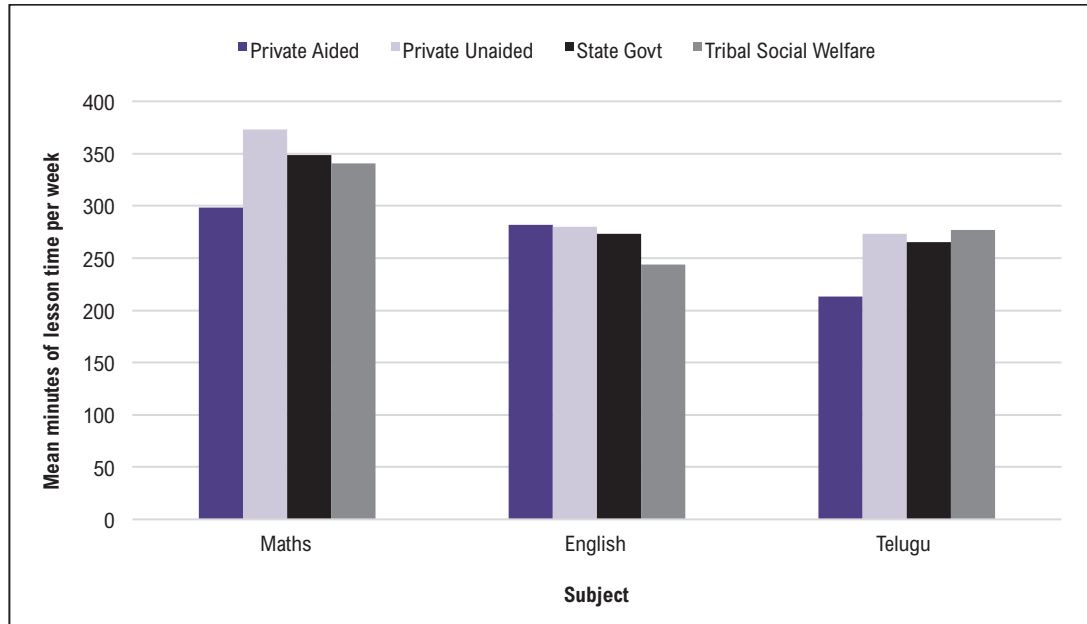

Table 54. *Head teacher characteristics, by school type (Telangana)*

School type	Mean age of head teacher	Male head teacher (%)	Mean years of experience as a head teacher	Head teacher has a B.Ed degree or higher (%)	Head teacher has current teaching responsibilities (%)
Private Aided	55	21	9	100	100
Private Unaided	45	71	10	84	74
State Government	46	69	2	100	88
Tribal/Social Welfare	47	71	1	86	71
Sample mean	**47**	**62**	**6**	**93**	**83**

Table 55. *Head teacher place of birth and current place of residence, by school type and locality (Telangana)*

School type	Head teacher is originally from this village or town (%)	Head teacher currently lives in this village or town (%)
Private Aided	86	100
Private Unaided	65	84
State Government	22	31
Tribal/Social Welfare	43	71
Urban	23	35
Rural	78	98
Sample mean	**50**	**65**

Table 56.   *Selected teacher characteristics, by school type (Telangana)*

School type	Mean teacher age	Male teachers (%)	Mean years of experience as a teacher	Teacher has a B.Ed degree or higher (%)	Teacher has permanent contract (%)
Private Aided	45	41	17	82	41
Private Unaided	36	48	11	68	27
State Government	43	55	13	86	78
Tribal/Social Welfare	34	24	7	59	35
Sample mean	**40**	**48**	**13**	**77**	**51**

Table 57.   *Teacher place of birth and current place of residence, by school type and locality (Telangana)*

School type	Teacher is originally from this village or town (%)	Teacher currently lives in this village or town (%)
Private Aided	41	76
Private Unaided	33	71
State Government	14	22
Tribal/Social Welfare	6	24
Rural	10	22
Urban	38	71
Sample mean	**24**	**48**

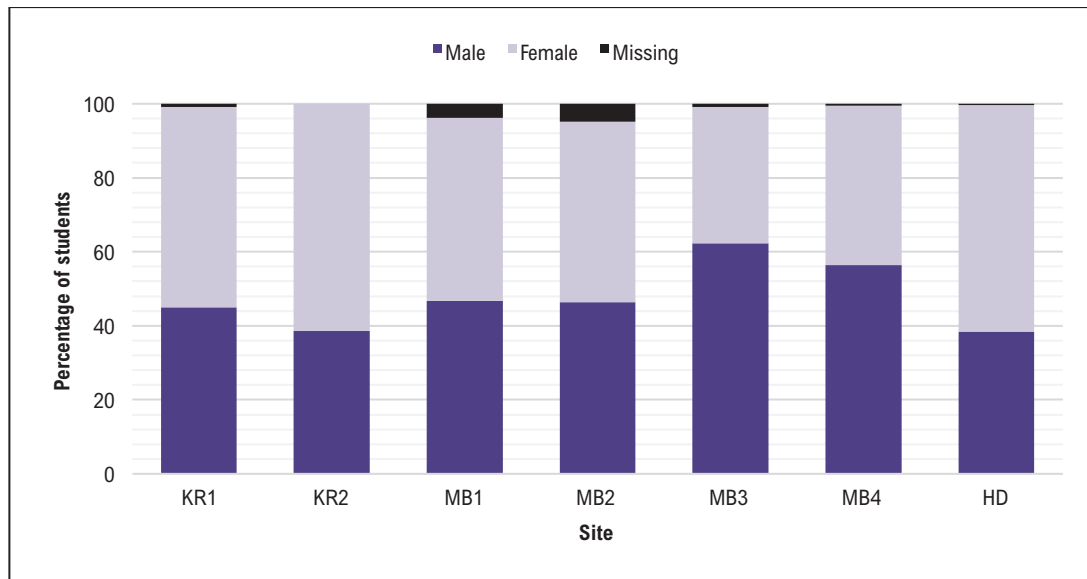**Figure 36.**   *Student gender, by site (Telangana)*

Table 58.   *Student background, by district (Telangana)*

Students who have lost at least one parent (%)	Students who report having no books at home (%) *	Students who report spending some time on the following activities on a usual school day **		
		Working on the farm or family business (%)	Chores or caring for family members (%)	Working for pay (%)
7	22	16	52	7

Notes: * Excluding school textbooks. ** The questionnaire asked students to specify the amount of time they spent working on these different tasks, from none to more than three hours. The data in this table collates all responses from less than one hour to more than three hours (e.g. excluding anyone who reported they spend no time on an activity).

Table 59. *Selection student characteristics, by school type (Telangana)*

School type	Male (%)	Mean student age (years)	Percentage of students from the most disadvantaged tercile in this school type	Social category (%)				Parental literacy (%)	
				SC	ST	OBC	GC	Neither parent can read	Both parents can read
Private Aided	33	14	12	19	2	32	47	7	78
Private Unaided	43	14	4	8	1	42	49	31	88
State Government	44	14	34	27	6	54	8	27	53
Tribal/Social Welfare	35	14	38	41	53	5	0	27	55
Sample mean	**43**	**14**	**.**	**15**	**4**	**45**	**36**	**11**	**77**

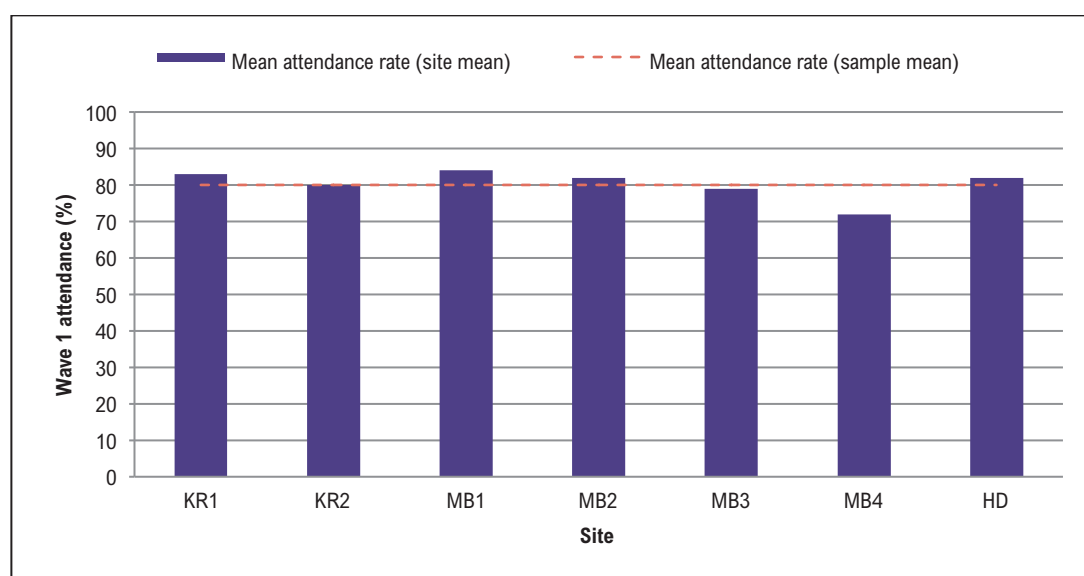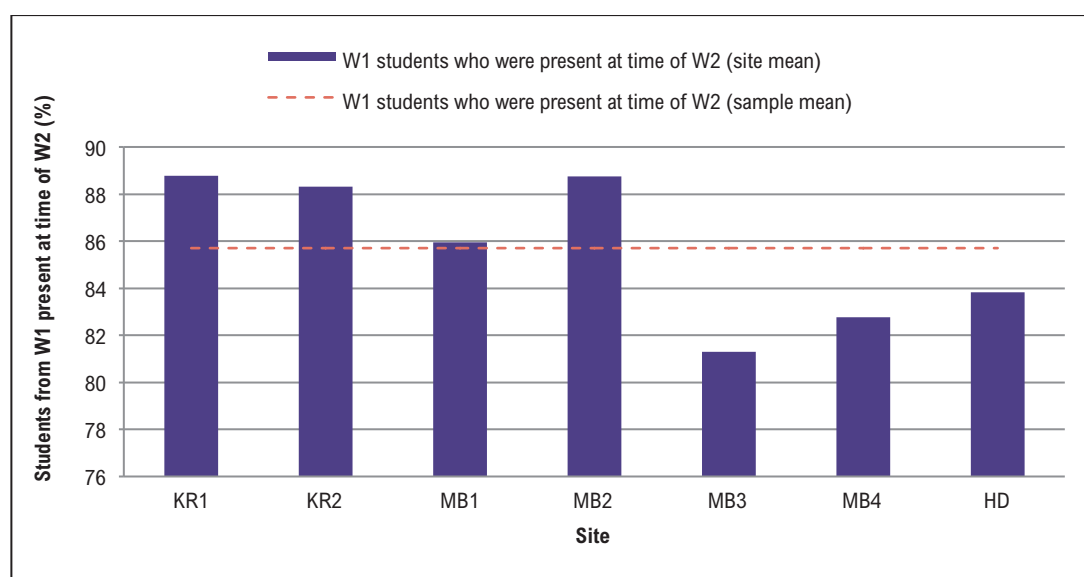**Figure 37.** *Wave 1 student attendance rate, by site (Telangana)*

Figure 38. *Rate of attendance of Wave 1 students at Wave 2 (Telangana)*

Notes: This includes students listed as no longer enrolled at the school.

Table 60.   *Student first language (Telangana)*

Students' mother tongue (where >1%)				
Telugu (%)	**Urdu (%)**	**Hindi (%)**	**Other (%)**	**Total (%)**
67	23	5	3	100

Table 61.   *Language of instruction, by school type (Telangana)*

Students in each school type whose medium of instruction is the same as the language they mostly speak at home (%)				
Private Aided	**Private Unaided**	**State Government**	**Tribal/Social Welfare**	**Sample mean**
45	4	72	15	26

Figure 39.   *Incidence of grade repetition and dropout, by site (Telangana)*
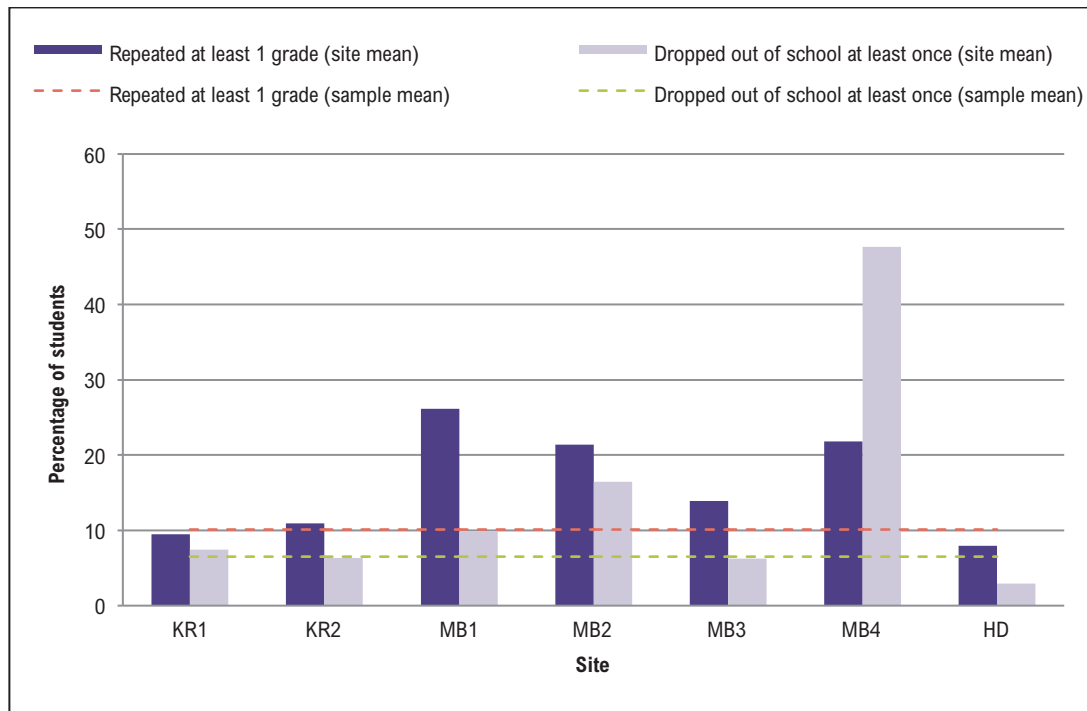

Table 62.   *Grade repetition and dropout, by school type (Telangana)*

School type	Grade repetition				Dropped out of school at least once
	Never repeated a grade (%)	**Reported repeating one grade (%)**	**Reported repeating more than one grade (%)**	**Have repeated at least one grade at secondary level (%) ***	
Private Aided	87	12	0	1	4
Private Unaided	95	4	1	1	3
State Government	79	19	1	2	14
Tribal/Social Welfare	80	17	3	0	8
Sample mean	**90**	**9**	**1**	**1**	**7**

Notes: * Secondary school in AP and Telangana covers grades 8-10. This column relates to students who report that they have repeated a grade in Class 8 or Class 9.

Table 63. *Student experiences of homework (Telangana)*

School type	Maths homework is given more than three times per week	Maths homework is always marked	English homework is given more than three times per week	English homework is always marked
Private Aided	43	44	28	37
Private Unaided	48	42	31	53
State Government	39	40	36	43
Tribal/Social Welfare	46	48	36	45
Sample mean	**45**	**42**	**32**	**50**

Figure 40. *Students attending private tuition, by school type (Telangana)*
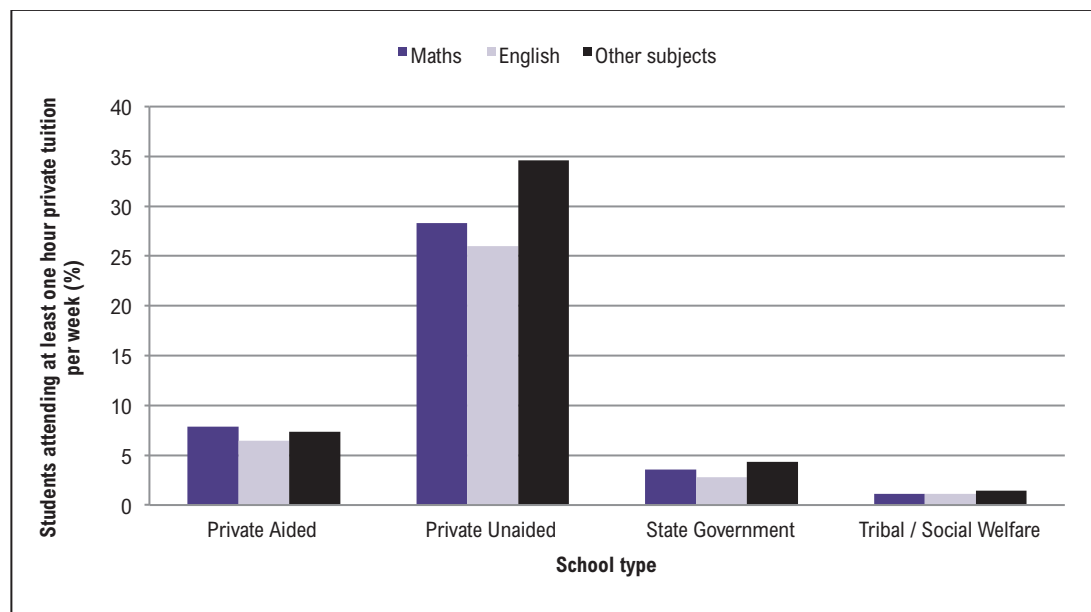

Table 64. *Student exposure to English outside school, by school type (Telangana)*

School type	Started learning English in Class 3 or earlier (%)	Student has the opportunity to practice speaking English to these people (%) *				Student has the opportunity to practice English in these ways (%) *	
		Mother	Father	Siblings	Friends	Read books, magazines or newspapers in English	Watch TV or movies in English
Private Aided	74	30	36	74	87	86	77
Private Unaided	95	52	54	84	93	96	84
State Government	69	10	13	44	54	66	70
Tribal/Social Welfare	47	7	15	71	91	88	78
Sample mean	**86**	**38**	**41**	**72**	**81**	**86**	**79**

Notes: * This includes students who reported that they have the opportunity to do this occasionally or often (e.g. it excludes anyone who said they never have the opportunity to do this, or that it is not applicable).

Figure 41. *Student use of a computer, by school type (Telangana)*
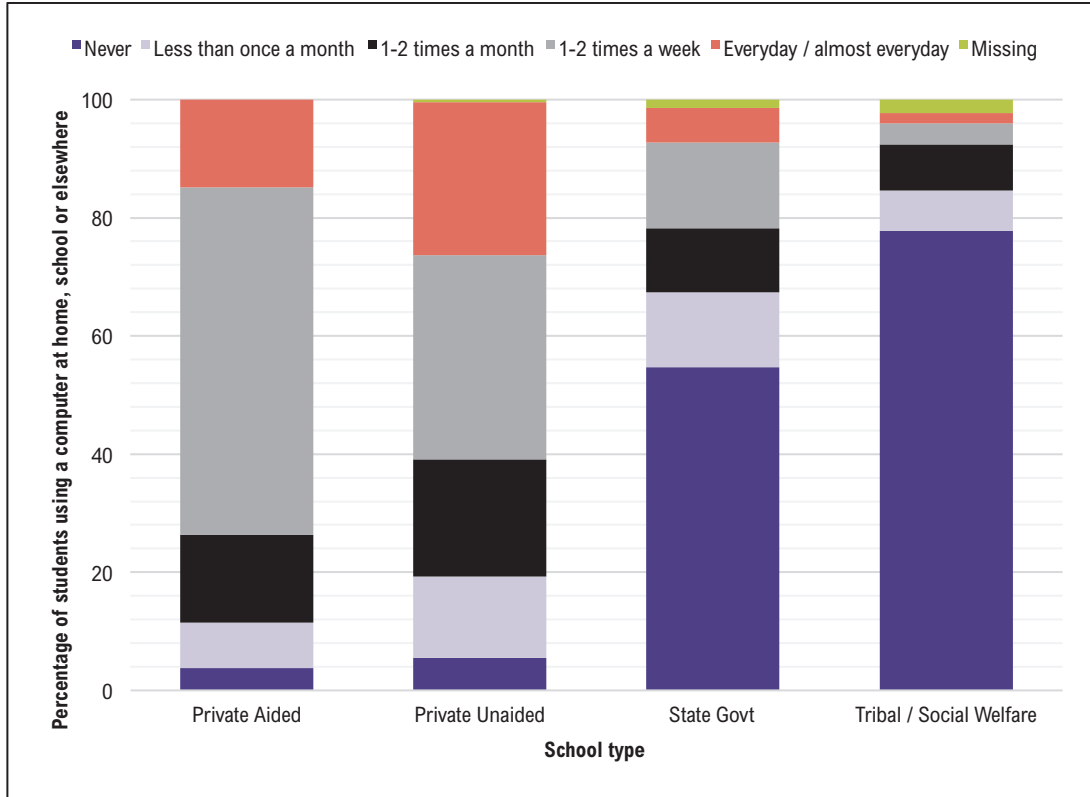
Notes: This collates student responses about their frequency of use of a computer at home, at school and in any other place.

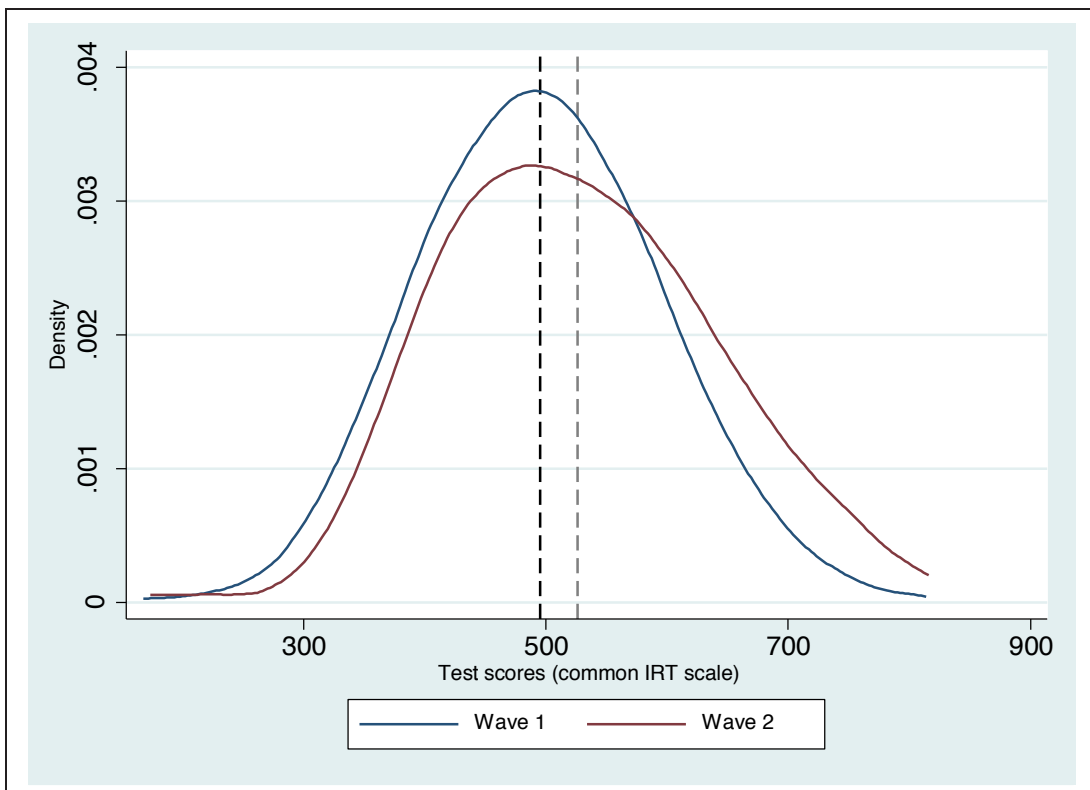**Figure 42.** *Wave 1 and Wave 2 maths performance (Telangana)*

Table 65. *Wave 1 and Wave 2 maths test performance (Telangana)*

	By school type				By locality		By gender		Sample mean
	Private Aided	**Private Unaided**	**State Government**	**Tribal/ Social Welfare**	**Rural**	**Urban**	**Male**	**Female**	
Maths Wave 1 test score	502	524	424	425	427	512.37	4961	495	495
Maths Wave 2 test score	489	559	449	450	458	543.04	527	525	526
Mean W1-W2 learning gain	-13	35***	25***	26***	31***	30.67***	31***	30 ***	31***

Notes: ***T-test of the difference in means is significant at the 1% level.

Figure 43. *Wave 1 and Wave 2 maths performance (Telangana)*

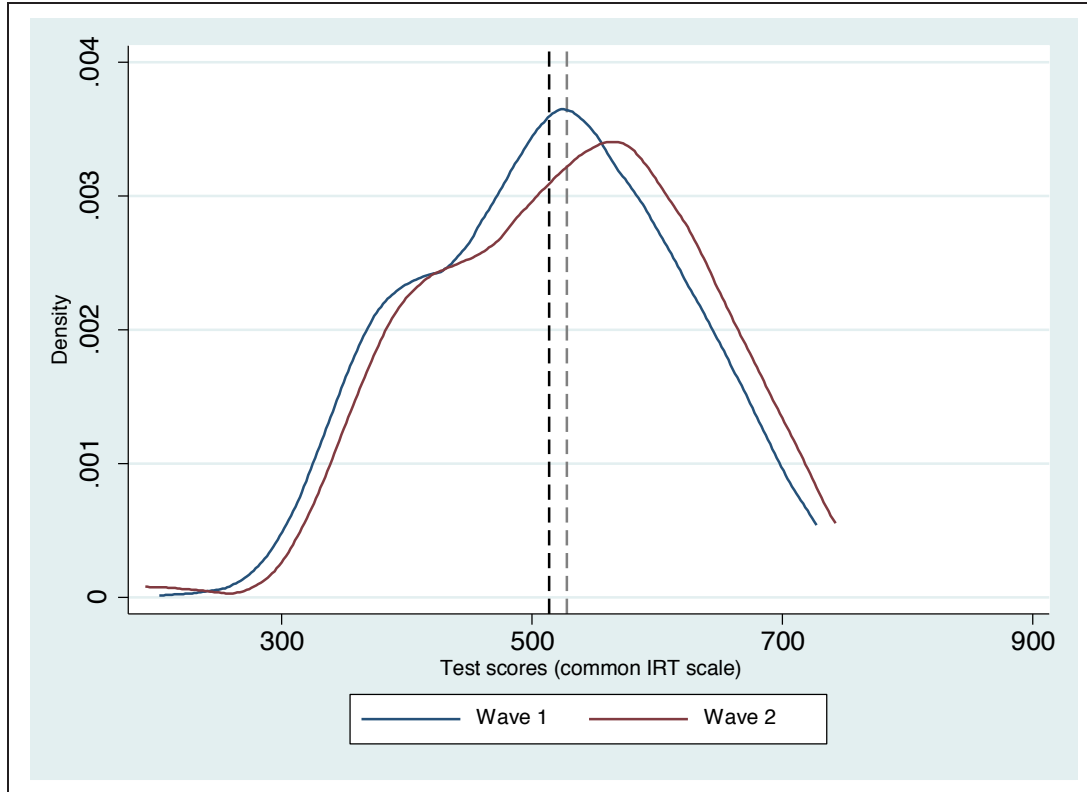**Figure 44.** *Wave 1 and Wave 2 English performance (Telangana)*

Table 66. *Wave 1 English test performance (Telangana)*

	By school type				By locality		By gender		Sample mean
	Private Aided	Private Unaided	State Government	Tribal/ Social Welfare	Rural	Urban	Male	Female	
English Wave 1 test score	485	557	408	439	415	539	507	519	514
English Wave 2 test score	485	573	421	452	427	554	517	536	528
Mean W1-W2 learning gain	0	16***	13***	13***	11***	15***	11***	17***	15***

Notes: ***T-test of the difference in means is significant at the 1% level.

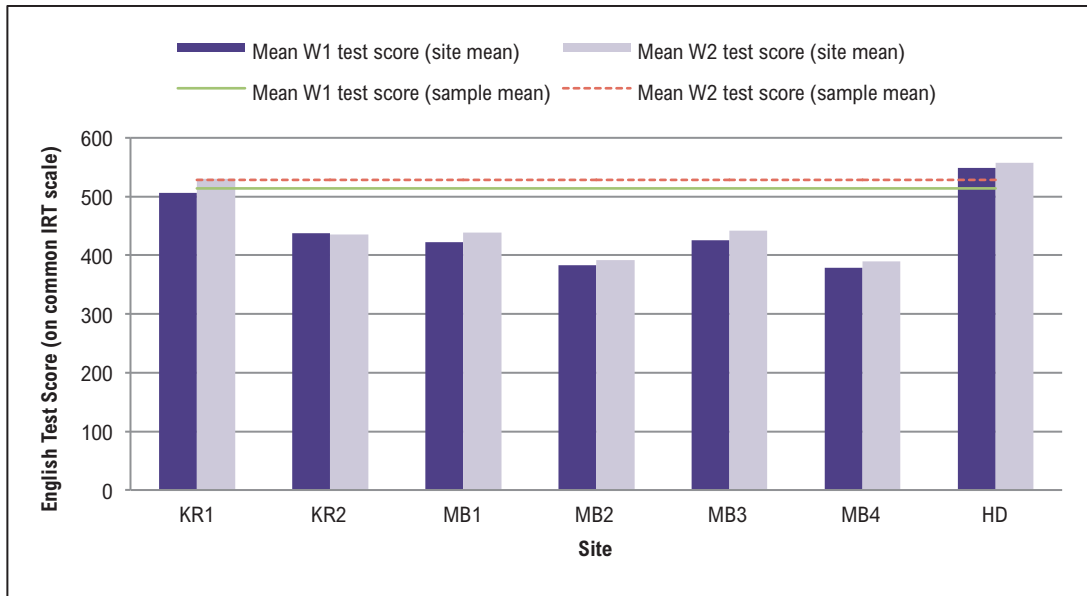**Figure 45.** *Wave 1 and Wave 2 English performance (Telangana)*

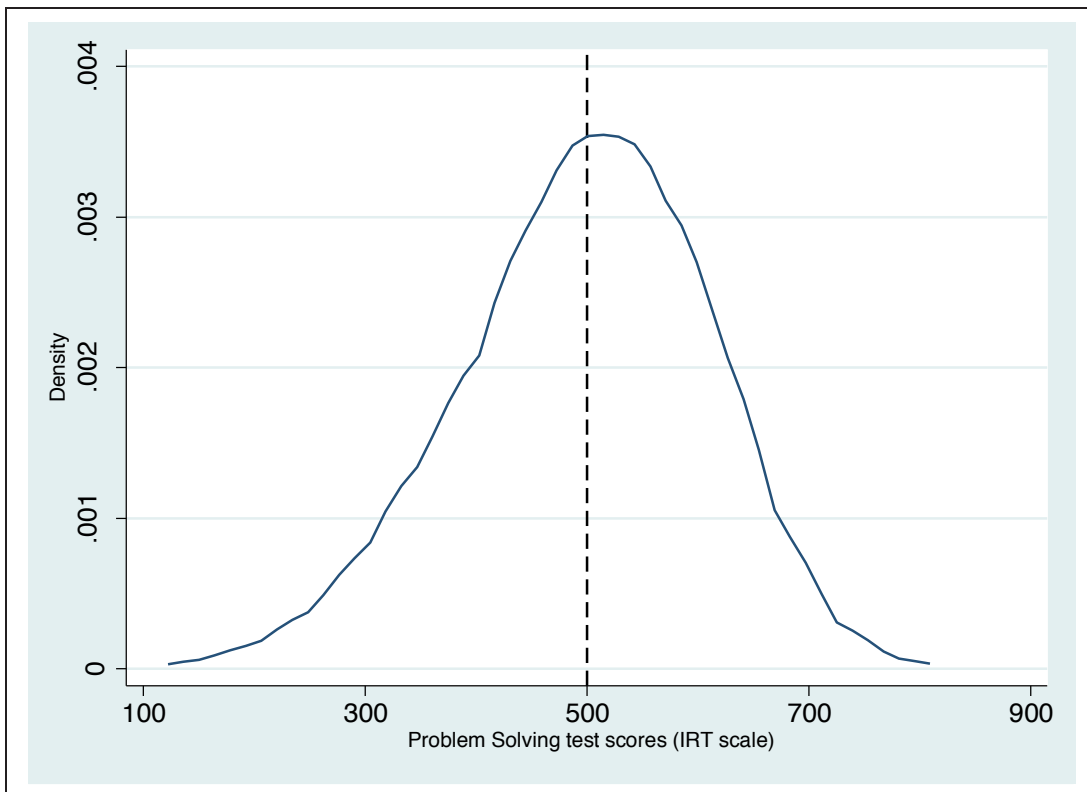

Figure 46. *Problem solving performance (Telangana)*

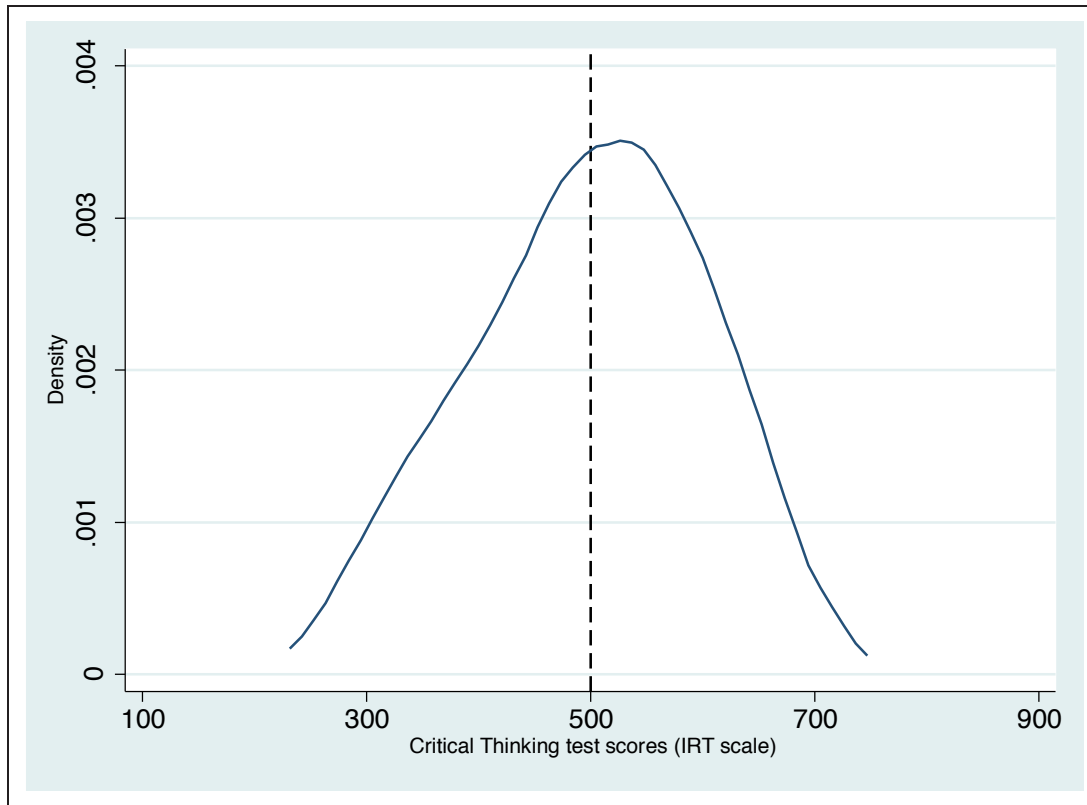**Figure 47.**   *Critical thinking performance (Telangana)*

Table 67.   *Transferable skills performance (Telangana)*

	By school type				By locality		By gender		Sample mean
	Private Aided	Private Unaided	State Government	Tribal/Social Welfare	Rural	Urban	Male	Female	
Problem solving test score	464	511	467	493	483	501	483	507	497
Critical thinking test score	466	513	466	483	477	504	482	510	499

Figure 48. *Problem solving and critical thinking test scores, by site (Telangana)*
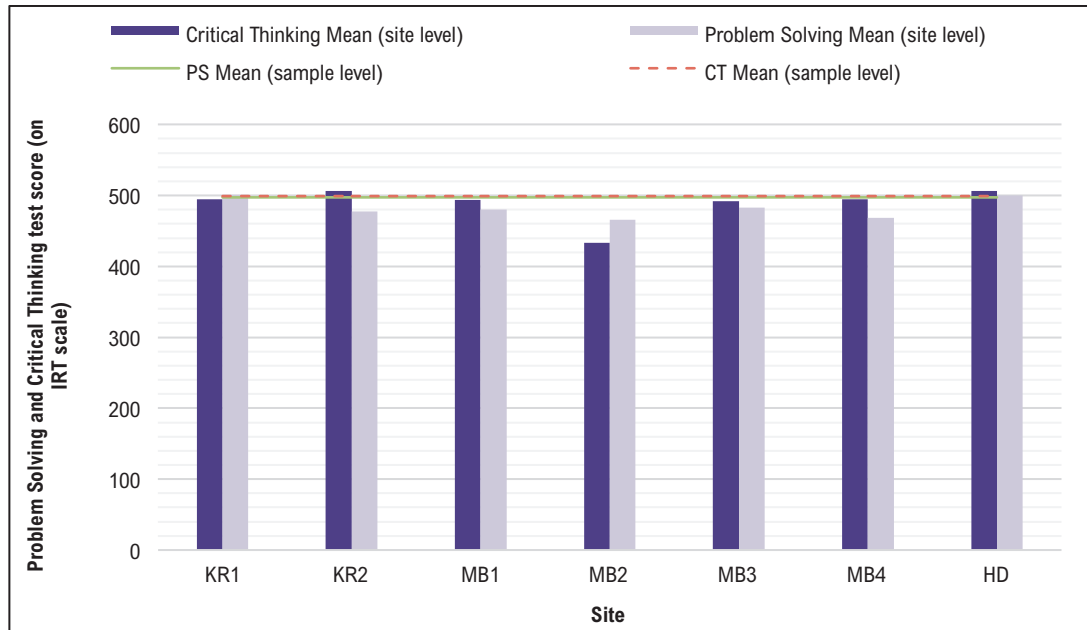
Young Lives School Survey, 2016–17: Evidence from India

This country report provides an overview of the Young Lives secondary school effectiveness study conducted in India (Andhra Pradesh and Telangana) in 2016-17 with around 9,000 children in Class 9. The survey was designed to allow analysis of what shapes children's learning and progression over a school year, and this paper gives a descriptive report of some of the main areas of data.

This secondary school study examined school effectiveness through three outcome measures: Class 9 students' performance in maths; functional English; and transferable skills. Student performance in maths and functional English was assessed using repeated measures, with linked cognitive tests administered at the beginning and end of Class 9; this allowed students' progress over the course of one year of secondary schooling to be considered in relation to their background, individual, class, teacher and school factors. This survey design has generated rich evidence about school and class effectiveness, and the drivers of learning within schools that children within the 20 Young Lives sites in Andhra Pradesh and Telangana could access.

Young Lives

An International Study of Childhood Poverty

About Young Lives

Young Lives is an international study of childhood poverty, involving 12,000 children in 4 countries over 15 years. It is led by a team in the Department of International Development at the University of Oxford in association with research and policy partners in the 4 study countries: Ethiopia, India, Peru and Vietnam.

Through researching different aspects of children's lives, we seek to improve policies and programmes for children.

Young Lives Partners

Young Lives is coordinated by a small team based at the University of Oxford, led by Professor Jo Boyden.

- *Ethiopian Development Research Institute, Ethiopia*
- *Pankhurst Development Research and Consulting plc, Ethiopia*
- *Centre for Economic and Social Studies, Hyderabad, India*
- *Save the Children India*
- *Sri Padmavathi Mahila Visvavidyalayam (Women's University), Andhra Pradesh, India*
- *Grupo de Análisis para el Desarollo (GRADE), Peru*
- *Instituto de Investigación Nutricional, Peru*
- *Centre for Analysis and Forecasting, Vietnamese Academy of Social Sciences, Vietnam*
- *General Statistics Office, Vietnam*
- *Oxford Department of International Development, University of Oxford, UK*

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