

# SMS Story Project: Bundi, Rajasthan

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This document looks at the impact of the SMS Story Project on the English learning levels of children in 50 government schools across the rural district of Bundi, Rajasthan. The quantitative and qualitative results of a controlled trial is utilized to showcase and gauge the magnitude of impact of a cost effective, phoneme based, SMS technology supported intervention, delivered through teachers in government schools. The programme was supported by Pratham Education Foundation and Voluntary Service Overseas.

## Impact Assessment Report



**Pratham**

Every Child in School & Learning Well

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## SMS Story Project Report

### 1. Introduction

This report presents the findings from The SMS Story Project, a controlled trial conducted by Pratham Education Foundation (Pratham) in collaboration with Voluntary Services Overseas (VSO), and the District Administration of Bundi, Rajasthan, India. The trial investigated the potential of using daily mobile phone text messages to support in-class English teaching-learning to improve the reading and comprehension skills of children in grades 4 through 7 across 50 rural government schools in Bundi district.

The research design facilitated the comparison of two different groups, namely the ‘control’ group in which children’s reading performance was measured but there were no project interventions and the ‘active’ group, which consisted of schools where two instructors responsible for teaching English to grades 4, 5, 6 and 7 received two text messages containing lesson plans and stories every day (Monday through Friday) for 7 weeks. The active group also received a poster explaining how to use the text messages and teaching-learning materials (TLM) such as flashcards. A 7 hour session (10 AM- 5 PM) explaining the use of SMS stories and phonic based language teaching, and a 4 hour practicum (10 AM- 2 PM) were given to the active group teachers.

The purpose of this report is to quantify the impact of providing SMS (Short Message Service) stories and lesson plans of phonics based English language instruction on the

progress in reading competency of learners by comparing students' reading scores in control and active schools at the start and finish of the intervention.

Reading performance was measured using the ASER English reading test that measured reading levels (Beginner, Capital Letters, Small Letters, Words or Sentence level) and a modified Early Grade Reading Assessment (EGRA) test. Reading levels were being compared in terms of phonic awareness, fluency and comprehension.

Holistically, this report also serves as an investigation into the scope and viability of improving in-class teaching and learning through a cost-effective and scalable technology measure such as the SMS.

## **2. Background**

Recognizing the value of education the Government of India, launched the Sarva Siksha Abhiyan in 2007, a flagship programme for Universal Elementary Education (UEE) catering to 192 million children across 1.1 million habitats, which has been successful in raising the total primary enrolment to 96.7% (of children between the ages of 6- 14). At first glance, it seems that a health majority of the nation's children are going to school and learning. Here lies the fallacy of the assumption; children going to school is a visible problem, but whether they are learning is not. Over the past decade the Annual Status of Education Report (ASER) has shed light upon learning only to discover that schooling and learning are not synonymous in the Indian education set up. The citizen led survey, facilitated by Pratham has shown that 50% of children with 4 years of formal primary

schooling have not learned to read and write fluently (ASER, 2014). As this problem of not-learning has not improved over the past decade despite increasing government spending on primary education, it has created a precarious and volatile situation where school going children in India are ill equipped to face a competitive world where the fundamental skills of reading and writing are a must. Without basic literacy these children are unable to learn and so lag behind in other subjects. Therefore almost 50% of the nation's young citizens are unprepared for the challenges of a knowledge driven economy. Without the ability to read and write it is unlikely they will be privy to the security of health, wealth, safety and democratic participation that literacy brings.

This boggart<sup>1</sup> of non-learning in India becomes more terrifying, as workers without a working knowledge of English earn 34% lesser than their English speaking peers.

Considering the lack of an English speaking environment throughout much of rural India, students who can read and write in their school-language (non-English medium) but are not proficient in English will be unable to compete for prized jobs in a narrowing job market. Given that only 20% of the populace is conversant in English, it puts an insurmountable strain on the talent pool. An indigenous Edison might not be able to bring forth light into the future, because English was not his strong suit. Although English is considered the language of aspiration, many rural children do not have sufficient access to it, which the SMS Story Project aims to provide. The pilot in Bundi is an English language teaching experiment, it can be extended to other languages and subjects. This project aims to explore the possibility of exploiting the growing mobile network in India (more than 900 million connections) to deliver teaching and learning material across remote locations otherwise

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<sup>1</sup> An imaginary creature in J.K Rowling's work that takes the form of an individual's worst fears

challenged with little access to appropriate content with negligible monetary cost- less than 10 paise<sup>2</sup> per SMS per child per day, making it a viable tool for mass-scale implementation if proven to be effective in aiding teaching and learning.

### 3. SMS Story

Teachers in the rural district of Bundi, Rajasthan needed support in the teaching of English. The bureaucrats and school administrators recognised that the SMS Story provided them with a unique opportunity to investigate the value and effectiveness of SMS based low cost nudges to improve the teaching-learning landscape across government schools. The choice of the location was motivated by the fact that on average only 21% of children in grades 1 through 8 can read simple English words in Rajasthan, of which 58.1% can tell the meaning (ASER Rajasthan Report).

The SMS Story project pilot was a controlled trial to test the impact of using daily mobile phone text messages to send English lesson plans and stories to elementary teachers. The intervention was part of a joint collaboration of Pratham and VSO with the assistance of the District Magistrate's office in Bundi. It was designed based on the findings of a similar intervention by VSO in Papua New Guinea (PNG).

The SMS Story trial was conducted in the Bundi district of the state of Rajasthan in India. The trial tested the effectiveness of the methodology, technology and impact on teacher practice and student reading performance. It examined costs, identified enabling and

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<sup>2</sup> INR 8000/(2400 children x 7 weeks x 5 days)

constraining factors, explored additional potential uses of the technology, and considered the scalability of the methodology for wider deployment at the state or national level.

A total of 35 stories were used through the 7 week intervention, with each story less than or equal to 160 characters (maximum limit of an SMS). The stories used in the daily text messages followed a phonics progression and were written by Pratham's English content team with the support of a VSO volunteer (Alison Gee) who had participated in SMS Story project in PNG. Special care was taken to make the stories culturally relevant and engaging for the children in rural Rajasthan. The stories were meticulously designed considering the character limitation of an SMS. One story was limited to one SMS message. Early stories were highly decodable and simple. As the stories became more complex multi-day stories were introduced and these would focus on related graphemes. Care was also taken to build continuity through the stories to build curiosity across a story line.

High frequency, non-decodable words were introduced gradually. There was repetition of high frequency words from the most common 100 English words and, with a few exceptions, these were introduced sequentially. The lesson plans were also designed to fit into one standard text message. The text messages reinforced the importance of following the poster sequence and introduced comprehension questions (why, what, when, who, how). A limited number of teaching strategies were included which were either on the poster or in common use in Bundi's elementary schools. Activity based teaching-learning was promoted to encourage class participation. The daily SMSs were sent to the teachers using Moplet, a low cost and user friendly internet messaging platform. In the latter stages of the pilot, WhatsApp, a digital messaging platform was used to deliver, sounds and songs to aid teaching and learning. WhatsApp served as a virtual meeting place for teachers and

other project participants. This facility was limited to the teachers who had internet enabled phones and were able to use the application, just under 20% of the teachers in the active schools. It was noticed that some teachers who did not have access to a smart-phone, actively borrowed the extra support material from colleagues who did.

The Rajasthan pilot differed from the one in PNG in two significant ways, namely the inclusion of a Teacher Training workshop and the implementation of a continuous monitoring strategy, where monitors supported teachers while teaching phonics based English.

### **3.1 Teacher Training**

The 50 active school teachers were asked to attend a 1.5 day workshop when they were given information about the project. They were informed about the background and how there had been a VSO trial in Papua New Guinea, they were also given an introduction to phonics and the process was explained.

They were to receive 2 daily text messages at 2pm. One message contained a story, which they were instructed to write on the blackboard. They were asked to read this story to their class pointing at each word as they read. They then read the story with their class, again pointing at the word as it was read, and then the class read the story to the teacher.

The second message contained a lesson plan. If new sounds and words are to be introduced during the lesson then they are to be taught before the story is read to the class.

Teachers were given a poster to explain how they were to teach the stories and a set of flash cards with all the sounds and words that the children would learn in the seven week intervention.

During the training the teachers were also given notebooks and it was suggested that they write the stories and lesson plans in these books so that they could use them again in the future.

### **3.2 Continuous Monitoring**

The monitors visited the schools on a regular basis. There were three monitors and they each had 8 or 9 schools and so were able to build up relationships with the teachers and children. One of the monitors had previously worked as a teacher, while the other two were college graduates without any teaching experience beyond Pratham's training.

The monitors were given observation forms for every visit. It was noticed that all the teachers came prepared to class with the stories written in their notebooks. English and Hindi were usually used in the classroom although some teachers used only English in the SMS Story session.

Teachers and children took an interest in the SMS story project. Many children were familiar with the sounds and words related to the stories. Their enthusiasm for the stories was evident from the fact that many of them 'tracked' the story line. The teachers discussed the characters in the stories with the children and asked questions to improve comprehension. All the children were writing the stories in their exercise books and some

had even drawn pictures accompanying the text. Even though the project was aimed at improving written- English, the children's capacity of note- taking can be interpreted as a positive secondary outcome.

The Delhi Pratham and VSO teams visited randomly selected active schools. They too noticed the enthusiasm of the teachers and children.

#### **4. Baseline Findings**

Data collected in the baseline and subsequent analysis is presented in this section. Baseline reading assessments were conducted using the ASER English tool and a modified EGRA tool that tested reading ability of all the children (attending school on the day of testing) in grades 4 through 7 based on a 25 Decodable, 25 High Frequency and 10 Invented words.

Twenty volunteers were trained and deployed into the field to work in pairs. One volunteer interacted with the children, running them through the test, while the other measured and marked their performances in a pre-designed sheet. The volunteers were instructed to reverse their roles after testing half the attending children in a class. They were given a stop clock to keep time and were asked to allot a maximum of 60 seconds each for sections containing decodable and high frequency words. There was no time limit on the section containing invented words and the ASER English test. Correctly read words and words not read correctly were marked. Children were asked to read the words on the EGRA in order. The next set of words was presented if they consecutively read three words incorrectly. The EGRA test was used after assessing the children using the ASER test. Assessors were encouraged to rotate the ASER English test samples after testing a child, so that no two children tested consecutively were given the same sample. A child was assessed in a

comfortable and shaded space, away from other children to minimize the children's familiarity with the test prior to testing. There was no difference in the assessment methodology between active and control schools, to facilitate a comparison between these groups and to measure the impact of the intervention. The baseline test measured the English reading ability of children prior to the intervention. The findings provide a clear picture of the English reading ability of children in grades 4 through 7 across elementary government schools in Bundi district.

#### 4.1 Sample Composition

A total of 2408 children were tested across 50 schools for the study, of whom 47.7% were boys and 52.3% were girls. The low number of students per grade (an average of 12 pupils in each grade in each of the schools) can be attributed to the drop in enrolment in government schools due to the availability of private institutions<sup>3</sup>, and end of term period when the intervention was carried out. On average there were 60 students in an active school (with standard deviation of 30 students per school), and 38 students<sup>4</sup> in control schools (standard deviation of 19 students per school). There were more girls (56.7%) than boys (43.4%) across the active schools. In contrast, the control schools had greater numbers of boys (54.6%) than girls (45.6%). The gender-wise distribution of students across active and control schools is tabulated in Table 1.

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<sup>3</sup> As per discussions with head teachers in many - Some of the schools used to cater to children across many socio-economic sections a few years back; today they house children mostly from low income families.

<sup>4</sup> No students were present in one control school. The instructors let us know that the zero student presence was not particular to the day of the test.

Gender	Active	Control	Total
Male	646 (43.4%)	503 (54.6%)	1149 (47.7%)
Female	841 (56.6%)	418 (45.4%)	1259 (52.3%)
Total	1487	921	2408

Table 1: Sample distribution by treatment group and gender

Of the total number of students tested during the baseline, 60% were in grades 6 through 7, while 40% were from grades 4 and 5. Table 2 shows further details of the class-wise distribution of students across the schools.

Grade	Active	Control	Total
4	264 (17.8%)	164 (17.8%)	428 (17.8%)
5	339 (22.8%)	195 (21.2%)	534 (22.2%)
6	428 (28.8%)	303 (32.9%)	731 (30.4%)
7	456 (30.7%)	259 (28.1%)	715 (29.7%)
Total	1487	921	2408

Table 2: Distribution of students at baseline across grades in active and control schools

The average number of children tested per grade during the baseline across active and control schools are shown in Table 3. On average, the ratio of students tested in grades 6 and 7 to grades 4 and 5 was 1.5 across the schools. More number of students tested in each school were enrolled in upper primary than primary.

Grade	Active	Control	Average
4	10.6	7.1	8.9
5	13.5	8.1	10.9
6	17.1	12.6	14.9
7	18.2	11.3	14.9
Average	14.9	9.7	12.3

Table 3: Average number of children tested per grade across active and control schools

## 4.2 Reading Levels

2408 students from grades 4 through 7 across 50 government elementary schools were assessed on their reading ability and comprehension using two tools during the baseline—the ASER English reading and comprehension test and a modified EGRA tool with three subsections that evaluated students on their capacity to read decodable, high frequency, and invented words. The average test time in active schools was 234 seconds (3m 54 s) with a maximum of 12 minutes, while in control schools it was 204 seconds (3m 24s) with a maximum of 10 minutes. The low average time for the reading tests can be attributed to the number of ‘early stops,’ when children could not read any work correctly, or did not attempt any question. It was observed that a child went through the test quickly if she was an advanced reader or had very low reading ability.

85% children tested during the baseline (83% from active schools and 88% from control schools) could not read the sentences on the ASER English test, which categorized reading performance into Beginner, Capital Letter, Small Letter, Word and Sentence levels. The distribution across the ASER reading levels is shown in Table 4. Of those 15% of children who could read at the sentence and word level, 51% and 41% could tell the meaning across active schools and in control schools 53% and 42% of sentence and word level readers could tell the meaning of the sentences and words respectively. The higher proportion of sentence readers showing comprehension suggests that the disconnect between comprehension and reading capacity narrows as children get better at reading, which although intuitive, quantitatively suggests that reading is an appropriate entry-point to improve English language comprehension. Table 5 shows the class-wise distribution of Word and Sentence level children across active and control schools. A higher proportion of

children who could read at the word level (or above) were from the upper primary grades.

The very low proportion of primary grade sentence level readers is of concern as the ability to read sentences is a stepping stone into richer bodies of work, to which these young children have no access because of their low reading ability.

Level	Active	Control	Total
B	167 (11.2%)	68 (7.4%)	235 (9.8%)
CL	148 (10.0%)	102 (11.1%)	250 (10.4%)
SL	638 (42.9%)	432 (46.9%)	1070 (44.4%)
W	284 (19.1%)	212 (23.0%)	496 (20.6%)
S	250 (16.8%)	107 (11.6%)	357 (14.8%)
Total	1487	921	2408

Table 4: Distribution of children according to their ASER English reading level

Grade	Word (Active)	Sentence (Active)	Word (Control)	Sentence (Control)
4	37 (13.0%)	9 (3.6%)	28 (13.2%)	11 (10.3%)
5	55 (19.4%)	49 (19.6%)	44 (20.8%)	15 (14.0%)
6	104 (36.6%)	90 (36.0%)	74 (34.9%)	47 (43.9%)
7	87 (30.6%)	103 (41.2%)	66 (31.1%)	34 (31.8%)
Total	284	250	212	107

Table 5: Class-wise distribution of Sentence and Word level readers

The ASER Rajasthan report indicated that an average of 15.5% children in grades 4 to 7 could read more than words in the state language as compared to the proportion of non-

English readers in our sample (64.6%)<sup>5</sup>, suggesting that English is a hurdle for children in the rural district of Bundi, Rajasthan.

Early Stop	Decodable (Active)	Decodable (Control)	Total	High Freq (Active)	High Freq (Control)	Total
No	837 (56.3%)	549 (59.6%)	1386 (57.6%)	783 (52.7%)	528 (57.3%)	1311 (54.4%)
Yes	650 (43.7%)	372 (40.4%)	1022 (42.4%)	704 (47.3%)	393 (42.7%)	1097 (45.6%)

Table 6: Early Stop (Decodable & High Frequency words) prevalence across active and control schools

A total of 42.4% and 45.6% of children tested during the baseline, namely 43.7% and 47.3% from active schools and 40.4% and 42.7% from control schools, could not correctly read a single word from the Decodable and High Frequency words sections from the modified EGRA English test, thereby constituting a large proportion of the sample showing an ‘Early Stop.’ The children were tested on a subsection with Invented words. They were not assessed on their ability to tell the meaning of the words. The decodable and high frequency word lists had 25 words each. There were 10 invented words on the test. The average time taken by children who displayed early stops was 186 seconds (3m 6s), compared to an average test time of 249 seconds (4m 9s) for children who did not show the early stop phenomenon through the baseline. The high proportion of early stops in our sample indicates the magnitude of the challenge to improve English reading across the government schools in Bundi district, which makes a low cost and scalable programme such as the SMS Story Project valuable. Figure 1 shows the class-wise prevalence of early stops across active and control schools, indicating that primary grade children had more early stops. Although a crude comparison of programme performance based on reduction in

<sup>5</sup> An average of 50.1% children in grades 4 through 7 were below-word level English readers across rural Rajasthan as per the ASER Rajasthan report, suggesting that government school children in Bundi are especially vulnerable in terms of their English capacity

early stops could be a ‘back of the envelope’ indicator, digging deeper into the average correct responses from students on the EGRA test suggests that children who could read something from the decodable or high frequency word subsections could read less than 40% (10 out of 25) of the words in that particular subsection as shown in Table 7. The low average performance on the invented words subsections seems to indicate that the children were not able to break words down into phonemes and read accordingly.

Words Correct	Active	Control	Average
Decodable	11.0	9.3	10.15
High Frequency	10.6	8.9	9.75
Invented	1.7	1.0	1.35

Table 7: Average words correct (Decodable, High Frequency & Invented) of children not showing early stop in Decodable or High Frequency word subsections

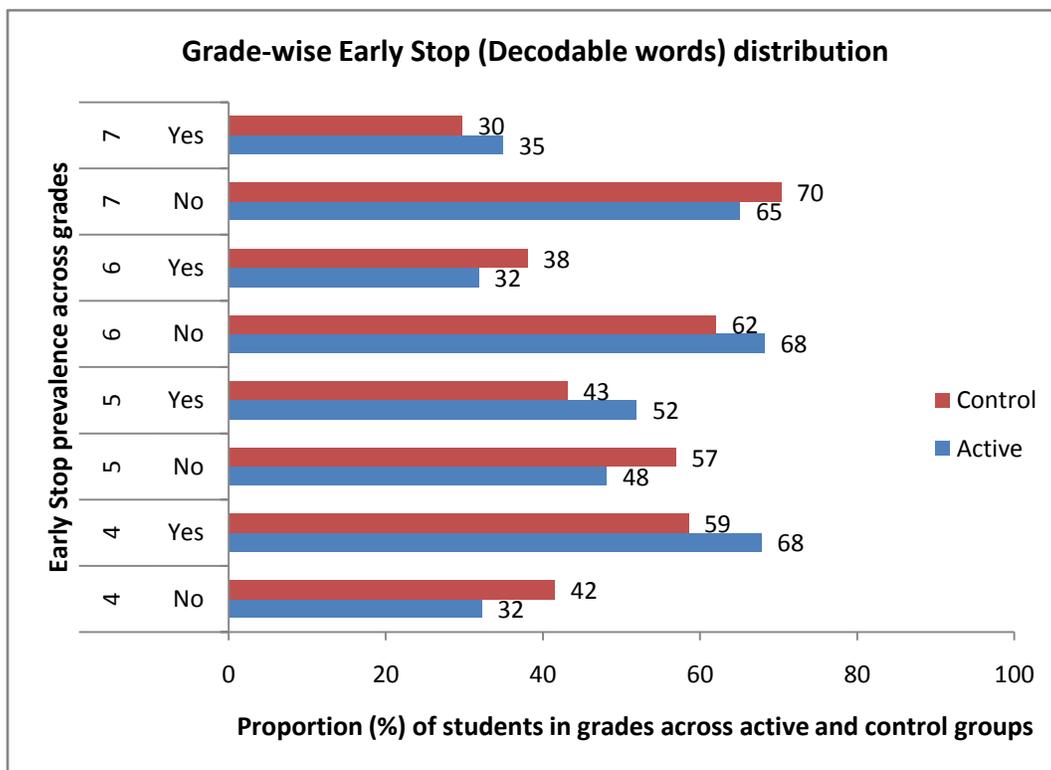


Figure 1a: Grade-wise Early Stop (Decodable words) distribution across treatment groups

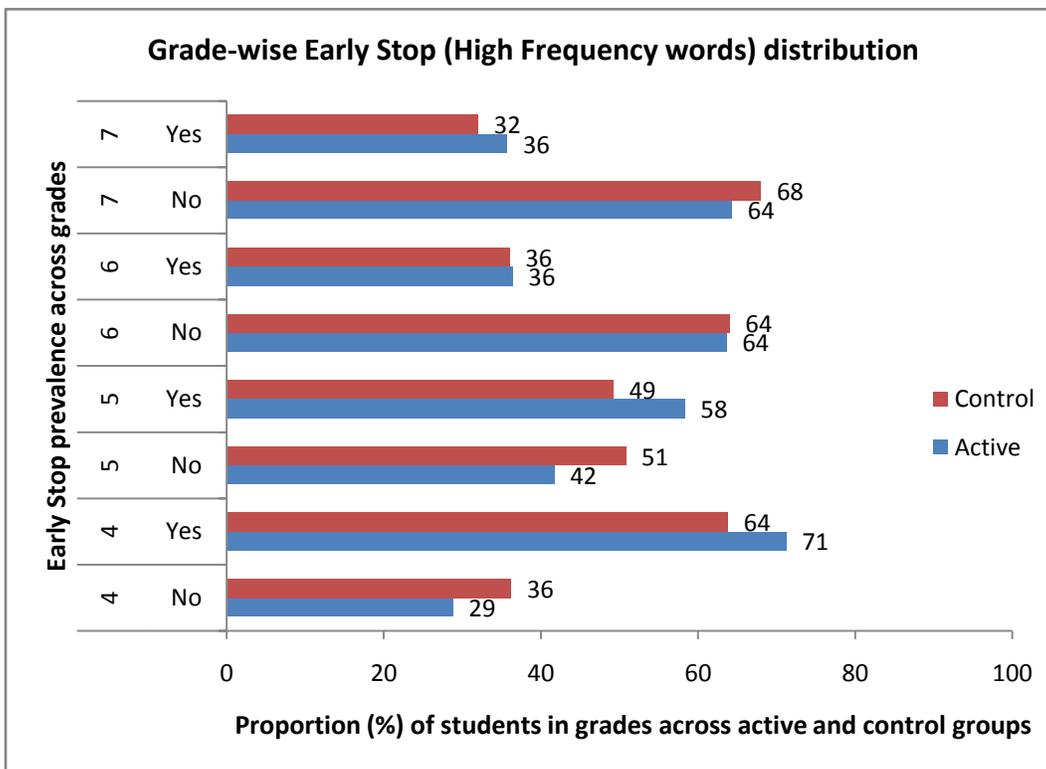


Figure 1b: Grade-wise Early Stop (High Frequency words) distribution across treatment groups

Grade	Active	Control	Average
4	2.3	3.1	2.7
5	5.3	4.5	4.9
6	7.6	5.8	6.7
7	7.9	7.6	7.8
Average	5.8	5.3	5.5

Table 8a: Grade-wise decodable words correct across active and control schools

Grade	Active	Control	Average
4	2.0	2.5	2.3
5	4.4	3.6	4.0
6	6.9	5.7	6.3
7	7.2	7.2	7.2
Average	5.1	4.8	4.9

Table 8b: Grade-wise high frequency words correct across active and control schools

The average number of correct decodable and high frequency words read by a child (including early stops) increases from grade 4 through to 7 as shown in Tables 8a & 8b. A child in grade 7 is able to read five more words correctly than a child in grade 4. As we move up a grade between grades 4-5 and 5-6, an average increase of 2 correctly read words is observed, while moving up from grade 6 to 7 corresponds to an increase of one word. A similar trend can be seen when looking at percentage of words read correctly out of attempted words as shown in Table 9, where across grades 4-5 and grades 5-6 there is an increase of 10% of words correctly read in comparison to 3.4% increase from grades 6 to 7. We are inclined to interpret the decrease in performance improvement in higher grades due to a 'back log' effect caused by the cumulative non-learning of a child. Simply put, as the English curriculum gets tougher from lower to higher grades, a child who has already fallen behind falls behind more steeply, hence the decrease in performance improvement across consecutive higher grades. The stories taught through the SMS Story Project are not connected to the curriculum and assumes no or very little exposure to the English language.

As the difficulty of the stories increases gradually students are provided with an opportunity to ‘catch up’ on their reading skills. The simplicity of the stories was designed to raise an interest in English by minimizing the difficulty. Therefore the 160 character limit of an SMS also served as a metric to keep the stories focused and suitable for remedial English teaching and learning.

Grade	Decodable (Active)	High Freq (Active)	Decodable (Control)	High Freq (Control)	Average (%)
4	17.7	16.0	21.1	17.7	18.1
5	30.2	25.9	30.3	26.5	28.2
6	42.4	40.3	35.5	36.4	38.7
7	42.4	41.2	42.8	41.9	42.1
Average	33.2 %	30.9 %	32.4 %	30.6 %	31.8 %

Table 9: Grade-wise percentage of words correct out of attempted words across schools

In conclusion, the teaching and learning of English in Bundi is impeded by a lack of resources, insufficient specialized English teachers, and textbooks at levels far removed from the abilities of the children. The SMS Story Project is aimed to fill these gaps by providing lessons to teachers via their mobile phones, providing teaching guidance to non-specialist English teachers, and using stories that match the abilities of the target audience, children in grades 4 through 7 who have not mastered the task of reading basic English.

## 5. Endline Findings

Students from active and control were given an endline test at the end of the 7 week intervention using the same tools (ASER English and EGRA) and testing procedures used in the baseline test. This analysis provides an opportunity to track the student body's performance in English through the intervention. A reduction in the number of 'Early Stops,' an improvement in English reading measured by the increase in the number Decodable, High Frequency words, and Invented words read correctly, and the distribution of students across reading levels (Beginner, Capital Letters, Small Letters, Words, and Sentences) are some of the key metrics to gauge SMS Story's impact. The endline performance of active and control schools are compared to quantify the degree of the programme's influence on English learning.

A total of 2408 children were tested at the endline. Of these 1487 and 921 children were enrolled in active and control schools respectively. The 4% drop in the sample size can be attributed to the fact that some children had stopped coming to school at the time of the assessment to help their family through the harvest season. As shown in Table 10, even during the endline there were more girls overall (54.1%) across both treatment groups. There were more boys (52.1%) in control schools, as compared to 41.2% in active schools. The gender distribution remained similar across the baseline and endline. A grade- wise distribution of children across active and control schools is shown in Table 11. Of the total number of children tested at the endline, 61% were in grades 6 through 7, while 40% were in 4-5. The average composition did not change significantly over the course of intervention. 1187 and 703 children from active and control schools respectively, were

students who were tested at the baseline; 81.6% of children assessed at the endline form the group of ‘common children.’

Gender	Active	Control	Total
Male	610 (42.2%)	453 (52.1%)	1063 (45.9%)
Female	836 (57.8%)	416 (47.9%)	1252 (54.1%)
Total	1446	869	2315

Table 10: Sample distribution by treatment group and gender

Grade	Active	Control	Total
4	250 (17.3%)	141 (16.2%)	391 (16.9%)
5	331 (22.9%)	182 (20.9%)	513 (22.2%)
6	425 (29.4%)	292 (33.6%)	717 (31.0%)
7	440 (30.4%)	254 (29.2%)	694 (30.0%)
Total	1446	869	2315

Table 11: Distribution of students at endline across grades in active and control schools

## 5.1 Endline Reading Levels

At the endline 2315 students from 50 active and control schools were assessed on the progress of their English reading ability and comprehension using the same tools as the baseline. No procedural changes to the testing were made, except that children who had unique identification numbers as per the baseline were marked as such. The average test time in active schools was 263 seconds (4m 23s), while in control schools it was 252

seconds (4m 11s); showing an average increase of 39 seconds from the baseline, demonstrating an increase of 17.6% on test time, perhaps indicative of the reading progress and confidence of the children. Since 80% of the students partook in the assessment for a second time, they were more familiar with the testing apparatus and procedures. It should be noted that children who were not part of the baseline in active schools took lesser time (252 s) as compared to 265 seconds for 'common children'. A similar trend was observed across control schools as well, with time differential of 10 seconds.

During the baseline 35.9% and 34.6% of the children from active and control schools, were able to correctly read Words and Sentences on the ASER English tool. At the end of the intervention 63.1% and 41.7% of the children tested across active and control schools respectively, could read at the Word or Sentence level. The difference between Sentence and Word level children from active and control schools at the baseline was 1.3%, which increased to 21.4% at the endline post 35 days of the SMS Story Project. There were 11.3% more sentence readers in control schools at the endline as compared to the baseline, while in active schools there were 22.8% more sentence readers. Of those children who could read at the sentence level, 62% could tell the meaning in active schools as compared to 48% in control schools. Thus indicating that the programme not only helped children become better readers but also helped their comprehension, evident from the 14% point difference. Since more children were pushed from the Small Letter to the Word level in active schools, a reverse trend is visible when we consider the proportion of word readers who are able to also comprehend the meaning of the word; 33% vis-a-vie 40% across active and control schools. The distribution of children across ASER English reading levels is shown in Table 12.

Level	Active	Control
B	86 (5.9%)	84 (9.7%)
CL	72 (5.0%)	84 (9.7%)
SL	376 (26.8%)	337 (38.8%)
W	338 (23.4%)	163 (18.8%)
S	572 (39.6%)	199 (22.9%)
Total	1446	869

Table 12: Distribution of children based on their ASER English reading level at the endline

The intervention reduced the proportion of children at the Beginner level; there were 11.2% Beginners in active schools at the baseline, which decreased to 5.9%, while in control schools the proportion of Beginners increased from 7.4% to 9.7% between the two testing periods. The proportion of children at the Capital Letter level was halved from 10% to 5%, and similarly the proportion of children at the Small Letter level decreased from 42.9% to 26% across the active schools. The reduction of proportion of Capital Letter and Small Letter in control schools was 1.4% and 8.1% respectively. The intervention seems to have had a two pronged influence on the learning of the children; it has helped the comprehension of students who could read before, while also encouraging students to progress into becoming readers, evident from the 20% point differential between sentence and word readers across active and control schools. On the other hand, the programme has successfully lifted children up from lower English learning levels, motivating them to move up readership levels. It is still the case that a greater proportion of sentence and word readers across both sets of treatment schools were enrolled in higher grades. Although it is encouraging to note that 41% of word readers in active schools were from primary grades 4

and 5 as shown in Table 13, which gives the class-wise distribution of word and sentence readers across treatment groups.

Grade	Word (Active)	Sentence (Active)	Word (Control)	Sentence (Control)
4	65 (19%)	66 (11%)	24 (15%)	22 (11%)
5	74 (22%)	122 (21%)	41 (25%)	42 (21%)
6	95 (28%)	186 (32%)	58 (36%)	61 (31%)
7	104 (31%)	200 (35%)	40 (25%)	74 (37%)
Total	338	574	163	199

Table 13: Class-wise distribution of Sentence and Word level readers at endline

As witnessed during the baseline a high proportion of children across the government schools in Bundi showed a propensity for ‘Early Stops,’ where they could not correctly read a single word from the Decodable, High Frequency and Invented word lists on the modified EGRA tool. The propensity of Early Stops across the Decodable and High Frequency sections are shown in Table 14; 82.8% and 82.9%, and 65% and 61.2% of children across active and control schools did not show the early stops, indicating a progress from 3% difference (between active and control schools) at the baseline to an 18% difference in the propensity of early stops for decodable words at the end of the intervention. Similarly, the 5% difference in the proportion of children not displaying early stop for high frequency words, increased to 22% between active and control schools at the endline. On an average there was a decrease of 20% points in early stops between active and control schools through the SMS Story Project.

Since ‘Early Stops’ are considered indicative of a child’s competency to decode English sounds, we infer that the programme running in active schools has resulted in improving

the children's capacity to decode. Comparing the performance of children not displaying a propensity of early stop in the sub-sections of the test, it is found that on average the students across active schools correctly read 30.8 words, while those in control schools read 24.8 words correctly as shown in Table 15(a). When all students are considered (including those who showed early stops) it is found that on average students in active schools are able to read 10 more words than students in control schools as shown in Table 15(b).

Early Stop	Decodable (Active)	Decodable (Control)	High Freq (Active)	High Freq (Control)
No	1198 (82.8%)	565 (65%)	1199 (82.9%)	532 (61.2%)
Yes	248 (17.2%)	304 (35%)	247 (17.1%)	337 (38.8%)

Table 14: Early Stop (Decodable & High Frequency words) prevalence across active and control schools at the endline

Words Correct	Active	Control
Decodable	14.3	11.9
High Frequency	13	10.6
Invented	3.5	2.3
Total	30.8	24.8

Table 15 a: Average words correct (Decodable, High Frequency & Invented) of children not showing early stop in Decodable or High Frequency word subsections at the endline

Words Correct	Active	Control
Decodable	11.8	7.6
High Frequency	10.7	6.4
Invented	3.0	1.5
Total	25.5	15.5

Table 15 b: Average words correct (Decodable, High Frequency & Invented) of all children (including those showing early stops) at the endline

The average number of correct decodable and high frequency words read by a child (including early stops) increases from grade 4 through to 7 as shown in Tables 16a & 16b.

On average a child in grade 7 is able to read 2.65 more words correctly than a child in grade 4 in an active school, while in control schools she reads 2.05 words correctly. As we move up a grade between grades 4-5 and 5-6, an average increase of 2 correctly read words is observed in active schools in comparison to 1 word in control schools, while moving up from grade 6 to 7 corresponds to an increase of one word in active schools and 2 words in control schools. The difference between the number of words read correctly (Decodable and High Frequency) is approximately 4 words between the active and control schools, which stays consistent as we move up the grades from 4 to 7.

Grade	Active	Control
4	8.9	5.1
5	10.6	7.3
6	12.6	7.4
7	13.5	9.5
Average	11.4	7.3

Table 16 a: Grade-wise decodable words correct across treatment schools at endline

Grade	Active	Control
4	7.5	4.3
5	9.6	5.8
6	11.6	6.4
7	12.5	8.2
Average	10.3	6.2

Table 16 b: Grade-wise high frequency words correct across treatment schools at endline

Looking at the percentage of words read correctly out of attempted words as shown in Table 17, where students across grades 4-7 in active schools correctly read 18% of the words they attempt to read, compared to students in control schools. The students in active schools attempt reading 4 more words than children in control schools, demonstrated that children who received the SMS stories were not only enabled to read better, but the programme also served to raise their confidence in ‘tackling’ English.

Grade	Decodable (Active)	High Freq (Active)	Decodable (Control)	High Freq (Control)
4	52.9	47	31.1	27.8
5	55.6	52.4	43.3	36.6
6	62.4	58.9	42.8	39.1
7	66.7	63	49.1	44.9
Average	59.4	55.32	41.6	37.1

Table 17: Grade-wise percentage of words correct (out of attempted) at endline

## 6. Conclusion

In conclusion, students who found English to be a challenge in government schools in the rural district of Bundi learned more through the course of the intervention. The phoneme based teaching- learning methodology adopted by the programme has contributed in raising the decoding skills of English learners in active schools. It should be noted that much of the evidence; decrease in early stop prevalence, increased word attempts, improved correct responses of attempts, and increased number of words correctly read by students in the active schools, indicates that the SMS Story project’s low cost nudges were effective in encouraging the children to learn English reading. Since the SMS Story Project is aimed at

systematically filling the learning gaps by providing lessons at the level of the children, it was effective in pushing students with lower learning levels into the becoming word and sentence readers. The endline analysis does bring out a disparity in terms of pushing readers to higher reading levels, and the number of more correctly read words due to the programme, which seems to suggest that the simplistic structure of the lessons was more suited to non-advanced learners. The evidence further seems to suggest that the sound based teaching and learning methodology was more appropriate for students who could not read at all at the baseline. Given the character limitations per SMS, one could deliver more complex stories for advanced learners through the use of multiple SMS's every day, or using a messaging service without the character limitations.

Listed below are recommendations to expand and improve the programme.

## 6.1 Recommendations

Recommendations of the project advisory group fall into four broad categories: scaling up the programme, improvements to the methodology, more technological assistance and other uses of the SMS Story content. Given the significant improvements in children's reading, it is strongly recommended that SMS Story is scaled up.

1. Scale up SMS Story Project in Bundi
  - a. Design and implement a district wide SMS Story project to cover a larger student populace and allow a greater number of interested teachers to adopt the methodology of phonemic English teaching
  - b. Appropriate monitoring and evaluation protocols to cover larger samples
  - c. Digitization of monitoring and performance measurement across schools
2. Improve stories and lessons plans to suit local flavour

- a. Extend the 7 week intervention to a longer duration
  - b. Modify stories and lessons to incorporate greater number of locally sourced stories, Rajasthani games and activities that students and teachers are familiar with
  - c. Improve comprehension improvement methodology
  - d. Introduce a wider genre of stories
3. Greater use of technology
- a. The WhatsApp group was a convenient platform to share support material to enhance the teaching and learning experience. Means of distributing such material to all teachers should be considered (including those who do not own a smart phone)
  - b. Digitization of assessment and monitoring to enable real time data-driven action
4. Use SMS Stories to improve related competencies
- a. Adapt stories to incorporate material from text books
  - b. Create advanced stories and lessons to encourage reader level children to build on their excellence