



ENDLINE EVALUATION OF READING OUTCOMES IN GOVERNMENT PRIMARY SCHOOLS (GPS)

USAID's Reading Enhancement for Advancing Development (READ) Activity

August 2018

USAID/Bangladesh: Cooperative Agreement No. AID-388-A-13-00006

DISCLAIMER: The author's views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development.

Writing Team

Ranak Chandra Mohanta, Save the Children
Priyanka Gayen, Save the Children
Shahana Parvin Lata, Save the Children
Amy Crompton, Georgetown University, USA
Maqbul Bhuiyan, Data Management Aid (DMA)
Dewan Abu Ehsan, Data Management Aid (DMA)

Editing Team

Clara Pava, Save the Children-US
Shahin Islam, Save the Children
Patricia Tibbetts, Save the Children-US
Emily Richardson, Save the Children-US
Md. Akidul Islam, Save the Children

Research Team

Uttam Kumar Dhar, Save the Children
Md. Shariful Alam Bhuiyan, Save the Children
Md. Hasan Imam, Save the Children
Mo Mo Shey, Save the Children
Ferdousi Fatema, Save the Children
Moon Moon Rahman, Save the Children
Tahsina Taimur, Save the Children

Government Coordination

Md. Salah Uddin, Save the Children

Concept, Design and Photo

Samiul Ahsan, Save the Children

Data Collection

Data Management Aid (DMA)

Overall Research Coordination

Monitoring, Evaluation and Research Team
USAID's READ Activity, Save the Children in Bangladesh

Published: July 2018

© Save the Children

CONTENTS

Acronyms	.
Acknowledgement	.
Executive Summary	.
Chapter 1: Introduction	.
Background	11
Baseline Study	13
Research Questions	14
Chapter 2: Research Methodology	.
Research Methodology	15
Sampling and Sample Size	15
Reading Assessment Tool	15
Selection and Training of Enumerators	17
Data Collection	18
Data Analysis	18
Chapter 3: Learner Characteristics: School and Home Environment	.
Background Characteristics	19
Home Environment	19
Home Literacy Environment	19
Education History and Situational Factors	20
Reading Habits	22
Chapter 4: Reading Results	.
Emerging Literacy Skills	24
Letter Knowledge	24
Most Used Words (Vocabulary)	25
Similar Beginning and Rhyming Words	26
Reader vs. Non-Reader	28
Higher Order Literacy Skills	29
Fluency (Words Per Minute)	29
Accuracy	31
Comprehension	31
Students with Comprehension	32
Higher Order Literacy Skills: Difference of Means Between Comparison and Intervention Groups by Grade Over Time	32
Correlations Between Reading Skills, Reading Behavior and Literacy Outcomes	33
Background Variables and Literacy Outcomes	34

Intent-to-treat Effect on Students' Literacy Skills for Grade II and Grade III	35
Chapter 5: Conclusions and Recommendations	.
Conclusion	37
Recommendations	37
Limitations and Challenges	38
Annex A: Supplemental Figures and Tables	39
Annex B: Research Instrument	49

LIST OF FIGURES

FIGURE 1: GEOGRAPHIC COVERAGE OF USAID'S READ ACTIVITY (2013-2018).....	13
FIGURE 2: AVERAGE STUDY TIME PER DAY (IN MINUTES): GRADES II AND III (INTERVENTION VS. COMPARISON)	22
FIGURE 3: PERCENTAGE OF STUDENTS WHO BORROWED A BOOK FROM A LIBRARY/BOOK CORNER: GRADES II AND III (INTERVENTION VS. COMPARISON).....	23
FIGURE 4: PERCENTAGE OF STUDENTS WHO READ WITH PEERS: GRADES II AND III (INTERVENTION VS. COMPARISON)	24
FIGURE 5: PERCENTAGE OF LETTERS IDENTIFIED CORRECTLY: GRADES II AND III (INTERVENTION VS. COMPARISON)	26
FIGURE 6: PERCENTAGE OF MOST USED WORDS CORRECT: GRADES II AND III (INTERVENTION VS. COMPARISON)	27
FIGURE 7: PERCENTAGE OF SIMILAR BEGINNING WORDS CORRECT: GRADES II AND III (INTERVENTION VS. COMPARISON)	28
FIGURE 8: PERCENTAGE OF SIMILAR ENDING/RHYMING WORDS CORRECT: GRADES II AND III (INTERVENTION VS. COMPARISON)	29
FIGURE 9: PERCENTAGE OF READERS: GRADES II AND III (INTERVENTION VS. COMPARISON).....	29
FIGURE 10: FLUENCY SCORES (WORDS PER MINUTE): GRADES II AND III (INTERVENTION VS. COMPARISON).....	30
FIGURE 11: COMPREHENSION SCORES OF READERS VS. NON-READERS: GRADES II (INTERVENTION VS. COMPARISON)	32
FIGURE 12: COMPREHENSION SCORES OF READERS VS. NON-READERS: GRADES III (INTERVENTION VS. COMPARISON)	32
FIGURE 13: STUDENTS WITH READING COMPREHENSION: GRADES II AND III (INTERVENTION VS. COMPARISON)	33
FIGURE 14: CORRELATION BETWEEN FLUENCY AND COMPREHENSION (ENDLINE)- GRADE II.....	44
FIGURE 15: CORRELATION BETWEEN FLUENCY AND COMPREHENSION (ENDLINE)- GRADE III.....	45

LIST OF TABLES

TABLE 1: SAMPLE DISTRIBUTION	16
TABLE 2: EGRA READING OUTCOME VARIABLES AND DEFINITIONS.....	18
TABLE 3: KEY VARIABLES	19
TABLE 4: EDUCATION HISTORY (ENDLINE ONLY).....	22
TABLE 5: FLUENCY SCORE BY CATEGORY- GRADE II & III.....	31
TABLE 6: GRADE II AND III HIGHER ORDER LITERACY: DIFFERENCE BETWEEN MEANS COMPARISON VS. INTERVENTION	34
TABLE 7: CORRELATIONS BETWEEN FLUENCY/BORROWING BOOKS AND COMPREHENSION.....	35
TABLE 8: DIFFERENCE IN LITERACY OUTCOMES BY BACKGROUND VARIABLES.....	36
TABLE 9: DIFFERENCE IN LITERACY OUTCOMES BETWEEN INTERVENTION AND COMPARISON GROUPS FOR GRADE II.....	36
TABLE 10: DIFFERENCE IN LITERACY OUTCOMES BETWEEN INTERVENTION AND COMPARISON GROUPS FOR GRADE III	36
TABLE 11: READING SKILLS FOR GRADE II & III AT BASELINE AND ENDLINE.....	40
TABLE 12: SAMPLING DISTRIBUTION OF ENDLINE PER REGION FOR GRADE II	40
TABLE 13: SAMPLING DISTRIBUTION OF ENDLINE PER REGION FOR GRADE III	40
TABLE 14: LETTER KNOWLEDGE AT ENDLINE PER REGION FOR GRADE II	41
TABLE 15: LETTER KNOWLEDGE AT ENDLINE PER REGION FOR GRADE III.....	41
TABLE 16: PERCENTAGE MOST USED WORDS AT ENDLINE PER REGION FOR GRADE II....	41
TABLE 17: PERCENTAGE MOST USED WORDS AT ENDLINE PER REGION FOR GRADE III ...	41
TABLE 18: PERCENTAGE OF SIMILAR BEGINNING SOUNDS AT ENDLINE PER REGION FOR GRADE II.....	41
TABLE 19: PERCENTAGE OF SIMILAR BEGINNING SOUNDS AT ENDLINE PER REGION FOR GRADE III.....	42
TABLE 20: PERCENTAGE OF SIMILAR ENDING SOUNDS AT ENDLINE PER REGION FOR GRADE II.....	42
TABLE 21: PERCENTAGE OF SIMILAR ENDING SOUNDS AT ENDLINE PER REGION FOR GRADE III.....	42
TABLE 22: FLUENCY (WPMC) AT ENDLINE PER REGION FOR GRADE II.....	42
TABLE 23: FLUENCY (WPMC) AT ENDLINE PER REGION FOR GRADE III.....	42
TABLE 24: STUDENT WITH COMPREHENSION AT ENDLINE PER REGION FOR GRADE II (80% OR MORE THAN 80% QUESTIONS ANSWERED CORRECTLY—ALL SAMPLE).....	43
TABLE 25: STUDENT WITH COMPREHENSION AT ENDLINE PER REGION FOR GRADE III (80% OR MORE THAN 80% QUESTIONS ANSWERED CORRECTLY—ALL SAMPLE).....	43
TABLE 26: LIST OF GPS ENDLINE SURVEY DISTRICTS AND DIVISION.....	43
TABLE 27: COMPREHENSION QUESTIONS ANSWERED BY READERS VS. NON READERS AMONG GRADE II STUDENTS.....	45

TABLE 28: COMPREHENSION QUESTIONS ANSWERED BY READERS VS. NON READERS AMONG GRADE III STUDENTS.....	46
TABLE 29: PERCENTAGE OF NON-READER AMONG GRADE II STUDENTS IN BASELINE AND ENDLINE BY DISTRICT.....	46
TABLE 30: CHANGE IN PERCENTAGE OF NON-READER AMONG GRADE III STUDENTS FROM BASELINE TO ENDLINE BY DISTRICT.....	47
TABLE 31: EFFECT SIZE OF KEY READING SKILLS AMONG TREATMENT VS CONTROL GROUP STUDENTS OF GRADE II	48
TABLE 32: EFFECT SIZE OF KEY READING SKILLS AMONG TREATMENT VS CONTROL GROUP STUDENTS OF GRADE III	Error! Bookmark not defined.

ACRONYMS

BBS	Bangladesh Bureau of Statistics
CODEC	Community Development Centre
DiD	Difference in Differences
DMA	Data Management Aid
EGRA	Early Grade Reading Assessment
ECD	Early Childhood Development
FIVDB	Friends in Village Development Bangladesh
GOB	Government of Bangladesh
GPS	Government Primary Schools
ICT	Information and Communication Technology
IER	Institute of Education and Research
JCF	Jagorani Chakra Foundation
NGO	Non-governmental Organization
NNPS	Newly Nationalized Public Schools
NCTB	National Curriculum and Textbook Board
ORF	Oral Reading Fluency
PEDP	Primary Education Development Plan
PNGO	Partner Non-Governmental Organization
READ	Reading Enhancement for Advancing Development
RDRS	Rangpur Dinajpur Rural Service
SCI	Save the Children International
SES	Socio-economic Status
USAID	United States Agency for International Development
VERC	Village Education Resource Center
WPMC	Words per Minute Correctly
ZKS	Zabarang Kalyan Samity

ACKNOWLEDGEMENT

The success of the study is attributed to the collaborative effort of many individuals and institutions. The study would not have been possible without the support of the research firm- Data Management Aid (DMA); local implementing partners- Jagorani Chakra Foundation (JCF), Village Education Resource Center (VERC), Community Development Centre (CODEC), Friends in Village Development Bangladesh (FIVDB), Rangpur Dinajpur Rural Service (RDRS); Directorate of Primary Education (DPE); selected Government Primary Schools of the 6 districts, along with district councils and local administrations. Salutations to the of Assistant Teachers and Head Teachers of the Government Primary Schools and Officials of Khagrachari District Primary Education Office.

Special thanks to the survey team who conducted and supervised the fieldwork of this study. They showed commendable dedication and hard work while working in some of the most remote areas of Bangladesh and maintained the highest quality of work throughout the process. Heartfelt gratitude goes to the staff members of the implementing partners and Monitoring, Evaluation and Research (MER) team members of USAID's Reading Enhancement for Advancing Development (READ) project. We are also thankful to the program team who effectively implemented the interventions in the most remote areas in Bangladesh. Humble recognition goes to Clara Pava, Emily Richardson, Patricia Tibbetts and Amy Crompton from Save the Children USA for their technical support and feedback on the report.

We are thankful to Kate Maloney and Muhammad Shahidul Islam of USAID Bangladesh Mission for their support and thoughtful comments on the report. Thanks go to Bushra Zulfiqar, Director-Education, Save the Children Bangladesh, for her guidance and support the READ team.

We sincerely hope that this study report will be able to provide a deeper understanding of the changes brought by the interventions of USAID's READ project in the Bangla reading ability of students from different areas of Bangladesh, as well as to increase stakeholders' understanding of early grade reading approaches in Bangladesh.

EXECUTIVE SUMMARY

BACKGROUND AND RATIONALE

In recent years, Bangladesh has dramatically succeeded in improving access to basic education and increasing primary school enrollment. Despite these successes, the lack of access to quality education remains a major challenge to students. Unavailability of supplementary teaching and learning materials, inadequate teaching methods, and poor infrastructure in primary schools has led to students falling behind as they fail to achieve satisfactory results, leading to grade repetition and/or dropout. The educational challenges have resulted in low literacy rates and have had wide-reaching effects on other aspects of society.

In this context, the Reading Enhancement for Advancing Development (READ) project, funded by United States Agency for International Development (USAID), was started in September 2013. The goal of the READ project is to improve the reading skills of children in grades I-III in Bangladesh. READ supports the government's existing efforts to enhance the quality of education in Bangladesh. Over the lifetime of the activity, READ reached 1.1 million students in 5,583 schools in selected districts of Bangladesh. The project focuses on 4 areas of intervention: 1) teacher education and continuous professional development, 2) reading assessment, 3) increased availability of reading materials, and 4) increased opportunities in the community to read and support beginning readers outside the school walls.

To assess the impact of the READ project on grade II and grade III children's reading competencies, an evaluation was carried out in March-April 2018. It adopted a repeated cross sectional design, with a control group for comparison. The study was conducted in 6 regions of Bangladesh (Barishal, Cox's Bazar, Dhaka, Jessore, Rangpur and Sylhet) among 765 grade II children and 768 grade III children. Results were compared to a baseline that was conducted in the same schools in June-July 2015. The duration of project implementation at the time of endline data collection was 2 years and 9 months.

FINDINGS

Reading Achievement

- Over 90% of students at READ schools have mastered emergent literacy skills, such as, letter knowledge, frequent word recognition, similar beginning words and rhyming words. At the endline, second graders in READ schools recognized 93% of the Bangla letters, identified similar beginning and rhyming words with 91% accuracy, and read 94% of the frequent words. The average third grader at READ intervention schools identified 95% of the letters, 96% of the frequent words, 93% of beginning word sounds, and 95% of rhyming words. These results show that most students are acquiring the emergent literacy skills to become readers.
- Over 90% grade II and grade III students of READ schools became reader (who could read minimum 5 words in 30 second) at the endline. In grade II it increased from 45% to 92% and in grade III in increased from 74% to 99%. Therefore, the percentage of non-readers in intervention schools decreased from 55% to 8% for grade II and 26% to 1% for grade III at the endline. Improvement of reading status at comparison schools was much lower compared to READ schools.

- Students in READ schools were more likely to be fluent readers than students in comparison schools. Students in READ schools had a greater oral reading fluency than students in comparison schools in the endline. Endline scores for grade II were 31 wpm (29 wpm at baseline) for the comparison group and 49 wpm (26 wpm at baseline) for the intervention group. For grade III, scores were 33 wpm (29 wpm at baseline) for the comparison group and 65 wpm (29 wpm at baseline) for the intervention group at the endline. Although students' fluency scores have increased significantly, fluency still presents as a challenge to students of both READ schools and comparison schools. To improve reading abilities, concentrated efforts need to be targeted towards strategies that improve students' overall fluency.
- All students at READ schools showed greater improvement in comprehension (both listening and reading) than students in comparison schools, and the difference is statistically significant (p<0.05). Improvement of listening comprehension among non-readers in READ schools was from 0% to 73% for grade II and 0% to 66% for grade III. For readers, reading comprehension increased from 52% to 86% in grade II and 45% to 66% in grade III.
- Significantly more READ school students could read with comprehension by endline, compared to comparison group. At endline, among all second grade students of READ schools, 68% could read with comprehension, compared to 37% students in comparison schools; it was 7% students from both groups in the baseline. For grade III, 75% READ school students could read with comprehension, (6% at baseline), in comparison to 37% of the non-READ school students (5% at baseline). Higher order thinking skills are not only critical for reading achievement, but they are also crucial to success in other academic subjects; these results indicate that the READ program may indirectly impact other educational outcomes in a student's academic trajectory.

Additional Findings

- There were no differences in achievement between students who attended preschool, students of different socioeconomic statuses or by gender. This may be an indication that previous government and donor-led initiatives to address these issues have helped reduce inequalities in these areas.
- Students at READ schools are more likely to borrow books from the library¹ than their peers at schools without the intervention. The baseline study found that fewer than 5% of students in both groups and grades reported borrowing a book from the library. However, at the time of the endline, a greater percentage of children in the intervention groups reported borrowing books from the library/book corner than at the baseline; 80% of grade II intervention students, and 81% of grade III intervention students reported borrowing a library book. These results may indicate that the access to library books that the READ program provided had a positive impact on students' interest in borrowing books; in other words, when there is a library, students will borrow books.
- Students at READ schools reported studying longer and were more likely to read with peers. In the endline², students in both grades reported studying for longer than 2 hours

¹ Students were asked if they had borrowed a book from a library and if they responded yes, they had the option to select which type of library from the following 5 options: school library, CRC, government library, community mobile library or other.

² Average study time data was only collected at the endline.

per day. The endline study also found that 42% grade II and 45% of grade III READ school students reported reading with peers compared to 16% grade II and 22% of grade III comparison group students.

CHAPTER I: INTRODUCTION

BACKGROUND

In recent years, Bangladesh has succeeded in improving access to basic education and in increasing primary school enrollment. Moreover, the net primary education enrolment rate was 90.5% in 2010³ with female enrollment at 95% and male enrollment at 86%. These statistics demonstrate the considerable progress Bangladesh has made toward achieving universal primary education. Successful partnerships between non-governmental organizations (NGOs), the Government of Bangladesh (GOB) and donors have been a major contributing factor in making progress in the education sector.

Despite these successes, the quality of education remains a major challenge for Bangladesh's education system, particularly for schools located in remote areas in Bangladesh, such as Sunamganj, Chars of Rangpur and Manikganj. The most essential measure of quality in a school system is whether its students are learning the foundational skill for all future learning: reading. The GOB's 2011 National Student Assessment identified weak Bangla competencies among the Grade III and V students. The findings also indicated that more students failed to meet grade-level competencies in Grade V than Grade III, suggesting that children fall behind due to weak foundational literacy skills. A subsequent survey conducted in 2013 and 2015 revealed that there has been very little improvement in reading competence since then⁴.

A student's reading trajectory is set in the early primary grades, and in Bangladesh most children are not acquiring basic reading fluency. A national survey conducted by the government in 2011⁵ identified that one-third of grade III students were below the benchmark for proficiency in Bangla reading competency. A subsequent survey conducted in 2013⁶ revealed that there has been very little improvement in reading competence. The READ baseline study conducted in 2015 by Save the Children International (SCI) in 6 regions of Bangladesh found that, consistent with parents' and teachers' perceptions of students' reading abilities, most students can read and recognize the alphabet and can grasp basic punctuation, but they read without understanding meaning.

Early grade reading is critical to the overall educational success of a child. Researchers have found that early grade students who fall behind in reading skills, perform progressively worse in later grades,⁷ and the achievement gap continues to impact the overall literacy of a child even after 10 years.⁸ Poor early grade readers are also more likely to repeat grades.⁹ As such, the current state of reading proficiency among early grade students in Bangladesh is a matter of concern.

³ UNESCO Institute for Statistics (UIS), 2017, Bangladesh. URL: <http://uis.unesco.org/country/BD>.

⁴ (Government of the People's Republic of Bangladesh Directorate of Primary Education, 2013 National Student Assessment for Grades 3 and 5 National Report, 29 December 2012; and Government of the People's Republic of Bangladesh Directorate of Primary Education, 2015 National Student Assessment for Grades 3 and 5 National Report, September 2016)

⁵ Government of the People's Republic of Bangladesh Directorate of Primary Education, 2011 National Student Assessment for Grades 3 and 5 National Report, 18 December 2014.

⁶ Government of the People's Republic of Bangladesh Directorate of Primary Education, 2013 National Student Assessment for Grades 3 and 5 National Report, 29 December 2012.

⁷ Crouch, L. 2012. Why Early Grade Reading: An Economist's Perspective. Presentation given at 'All Children Reading Workshop', Kigali, Rwanda, 28 February 2012.

⁸ Cunningham, Anne E.; Stanovich, Keith E. Early reading acquisition and its relation to reading experience and ability 10 years later. *Developmental Psychology*, Vol 33(6), Nov 1997.

⁹ Annie E. Casey Foundation. 2010. Early Warning: Why Reading by the End of Third Grade Matters. Baltimore, MD, USA: Annie E. Casey Foundation.

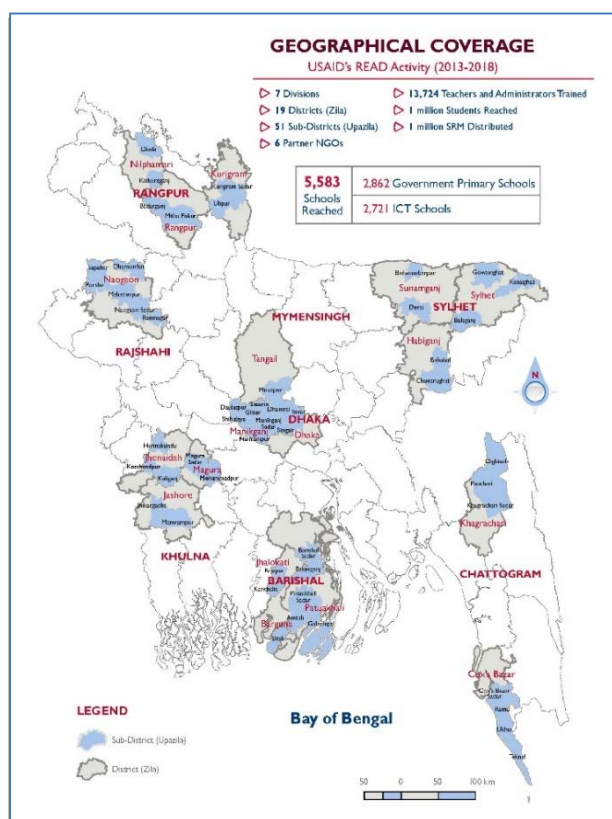
OVERVIEW OF READ

In this context, the Reading Enhancement for Advancing Development (READ) project, funded by United States Agency for International Development (USAID), was started in September 2013. The goal of READ is to improve reading skills in Bangla for students in grades one through three. READ supports the government’s existing efforts to enhance the quality of education in Bangladesh. The Government of Bangladesh’s (GOB) Third Primary Education Development Plan (PEDP III) provides a comprehensive framework to address many of these challenges in the education sector. READ directly benefitted an estimated 1.1 million grade I-III students in 5,583 READ-supported schools in selected 19 districts out of 64 districts in Bangladesh.

Initially READ activities started in 660 Newly Nationalized Primary Schools (NNPS) in 2014 and continued until September 2016. In 2015 READ expanded its activities to a new cohort of 850 Government Primary Schools (GPS). Among those 850 GPS, 45 schools phased out in 2017. Lastly in 2017, another 1352 schools were included under READ coverage which was still continuing at the time of the endline evaluation study. In total 705 schools received the intervention for 3 years, 805 schools for 4 years, and 1352 schools for 2 years. READ worked with all students of grade I, II and III simultaneously and provided support to all teachers who teaches Bangla in these three grades.

The project focuses on 4 areas of intervention: 1) teacher education and continuous professional development, 2) reading assessment, 3) increased availability of reading materials, and 4) increased opportunities in the community to read and support beginning readers outside of the school. Specifically, READ addresses phonemic awareness, letter knowledge, vocabulary/most used words, fluency and comprehension through these 4 areas of intervention. As such, the project anticipates a lower rate of dropout and repetition in early grades of primary education in the selected districts by building a strong foundation in lower and higher order literacy skills.

FIGURE 1: Geographic Coverage of USAID’s READ Activity (2013-2018)



Assistant teachers nominated from each school received a total eight days of training on reading instruction and assessment as part of READ activity (five days of basic training and three days of refresher training). In addition, Head teachers of these schools received three days of basic training and one day of refresher training on academic supervision/coaching. Each school received multiple copies of Supplementary Reading Materials (SRMs), ranging from 215 to 350 copies. In addition, READ conducted students assessment three times in a year.

Ultimately, READ reached an estimated 4 million direct and indirect beneficiaries in all 7 divisions of Bangladesh. Indirect beneficiaries include grade 4 and 5 students in target schools, people reached through public awareness activities on reading, and, finally, teachers and students from non-READ schools

who would benefit from the resources available on the READ website. Between 2014 and 2018, the READ project worked in 5,583 schools in 51 upazilas (sub-districts) in 19 districts across 7 divisions in Bangladesh (see Figure 1). Since 2014, READ is being implemented in partnership with 6 local NGOs in 7 regions of Bangladesh (see Figure 1); these NGOs include Rangpur Dinajpur Rural Service (RDRS), Friends in Village Development Bangladesh (FIVDB), Village Education Resource Center (VERC), Jagorani Chakra Foundation (JCF), Community Development Centre (CODEC) and Zabarang Kalyan Samity (ZKS).

BASELINE STUDY

Prior to the READ intervention in Government Primary Schools, Save the Children International (SCI) commissioned a baseline study to assess reading skills and collect information on student background characteristics. In accordance with the methodological requisites of a repeated cross-sectional design, the baseline for this study was conducted at the beginning of the project in 2015, while the endline took place at the end of project in 2018.

In June-July of 2015, baseline data was collected from 6 regions of Bangladesh. The purpose of the baseline study was to understand children's strengths and weaknesses in literacy development, and to identify groups of students needing additional literacy support to read at grade level. In total, the baseline study included 1,186 students from grades II and III from 70 schools in the regions. All students were assessed in Bangla. The content of the assessments for each measure was specific to each grade level. In order to assess key dimensions of equity, the baseline assessment also collected information on students' background (gender, socio-economic status, etc.), and home literacy environment (print materials available in the home, home reading habits, and literacy supportive interactions with family members).

The baseline survey found that grade II children had a good understanding of letter knowledge when asked to identify letters from the Bangla alphabet. On average, children in intervention schools identified 76% of letters correctly while children in comparison schools identified 72% of letters correctly. When given a list of the 20 most used words in their textbooks, on average, grade II children in intervention schools identified 55% of the words, while their peers in comparison schools could identify 60% of the words.

Approximately 50% of grade II children in both groups (45% in intervention schools and 50% in comparison schools) were identified as 'readers', a category defined as being able to read at least 5 words correctly from an 83-word story in the first 30 seconds of reading. In addition, on average, children in both types of schools could read the story with 90% accuracy. That implies that out of every 100 words, they were able to read 90 words correctly. Hence, most children who qualified as readers, read accurately.

For grade III children, the baseline study found that they were weak in reading fluency, measured by the number of words read correctly per minute. For grade III readers, average fluency was 37 words per minute for both groups. Poor reading fluency is often indicative of poor reading comprehension. Though the baseline found that 75% of grade III children were readers, the majority were unable to comprehend what they were reading. Only 5% of grade III students could read with comprehension (defined as a reader who could answer at least 80% of reading comprehension questions correctly).

The baseline survey also found that, in terms of background characteristics, household socio-economic status (as measured by the total number of household assets) was a strong predictor of home literacy environment. Poorest households were most likely to have only one type of material available or to have no reading materials at all, while students from wealthier households had 2 to 3

types of reading materials. Likewise, 50% of students from the poorest households had at least someone in their household who read to them, compared to 80% of children from wealthier households.

RESEARCH QUESTIONS

The Government Primary Schools (GPS) endline evaluation study was carried out to understand the impact generated by the READ project for grade II and III children in the sampled schools particularly in regard to their reading competencies. The endline study also collected background information and household level data of grade II and III children of the sampled schools.

Specifically, the GPS endline study aimed to answer the following research questions:

- What do we know about grade II and grade II students' Bangla reading skills?
- What do we know about the learning environment of grade II and grade II students?
- What is the impact of the READ program in Government Primary Schools that took place from January 2015 – March 2018?

CHAPTER 2: RESEARCH METHODOLOGY

RESEARCH METHODOLOGY

The study was conducted using a repeated cross-sectional design; this methodology was utilized as it takes a snapshot of a given population at a specific time and, as such, is commonly used to measure pre and post test results of an intervention such as the READ program. The respondents were students of grade II and III in both schools where the READ project was implemented (intervention group) and schools that did not have the READ project (comparison group). The data was collected using tablet devices and KoBoToolbox software¹⁰.

Sampling and Sample Size

Overall sample size was calculated while planning the baseline survey and same sampling strategy was followed for both baseline and endline. Students from same schools were interviewed at baseline and endline; however, due to repeated cross sectional design of the study, students were chosen randomly for each survey. A multi-stage cluster random sampling method was employed for selecting the schools and children in the sample. From each of the six regions, one district under READ intervention was selected randomly at the first stage. As READ coverage did not include all upazilas of a district, in the second stage, a number of upazilas under READ intervention were randomly selected, from which schools were randomly chosen. Comparison schools were also chosen randomly from upazilas adjacent to READ intervention upazilas, where READ was not active. At the time of endline data collection, second grade students at intervention schools benefited from the READ program for 15 months, and third grade students at intervention schools had benefited for 21 months.

Children from grades II and III of the sampled schools present in their classroom during the data collection were candidates for this study. Children absent from school on that day or who were unwilling to participate were excluded from the study. After schools were selected, boys and girls were then selected by systematic random selection, using the class attendance register. Ten students (5 boys and 5 girls) were selected in this way from grade II and grade III. In total, data were collected from 1,186 students, 591 children from grade II and 595 children from grade III in the baseline. At the endline, the sample size was 1,533, with 765 grade II and 768 grade III students (746 boys and 787 girls). The sample distribution by intervention and comparison groups for both the baseline and endline studies is shown in Table I.

TABLE I: SAMPLE DISTRIBUTION

	GRADE II			GRADE III			TOTAL SAMPLE
	Intervention	Comparison	Total	Intervention	Comparison	Total	
Baseline	349	242	591	355	240	595	1,186
Endline	380	385	765	383	385	768	1,533

Reading Assessment Tool

¹⁰ In baseline study, the data was collected by using the Tangerine system.

Learners of alphabet-based languages acquire reading skills in phases. Initially, students build basic literacy skills by developing letter knowledge, sound knowledge, word knowledge and simple decoding of letters into sounds. Gradually, students can identify and sort familiar words by creating a bank of words that they can recognize on sight. Eventually, students learn to read fluently and build a framework that enables them to attribute meaning to written text.¹¹

To measure reading outcomes for students, the Early Grade Reading Assessment (EGRA) tool was used. EGRA is an assessment tool, developed through the collaboration of large network of scholars, practitioners, governments and education development institutions, seeking to enhance early reading assessment of primary school children in various low-income countries across the world. It is conducted through examinations, interviews, surveys and classroom assessments to obtain information on the reading ability and learning outcome of students, along with educational support from family members, schools and community.

The EGRA tool has been designed based on the principle of acquiring reading skills in phases. EGRA measures the acquisition of reading skills in three progressively advanced phases- 1) an emerging literacy phase in which a learner develops the phonemic awareness, 2) a decoding phase in which a learner learns to identify letters, syllables and to read words and non-words, and 3) a confirmation and fluency phase, in which a learner develops oral reading fluency with comprehension.

The reading stories for student assessment were developed in a four-day workshop with literature and language experts, M&E specialists in education sector and READ team members. After development, the stories were approved by National Curriculum and Textbook Board (NCTB) personnel. The assessment includes the relevant subtasks associated with the above-mentioned phases as follows:

- **1st phase (Emerging literacy skills):** phonemic awareness (similar beginning sounds and similar ending sounds) and listening comprehension.
- **2nd phase (Decoding skills):** letter identification and familiar (most used) words reading.
- **3rd phase (confirmation and fluency):** reading comprehension (fluency, accuracy), and comprehension questions.

Students were administered subtasks to measure skill acquisition for each of the 3 phases mentioned above. For example, in the oral fluency subtask, students were asked to read a grade-appropriate reading subtask, developed by the SCI team. The subtask was a story of 76 words for Grade II level and a story of 85 words for Grade III level. All students were given the subtask and only those who could read at least five words correctly in 30 seconds (defined as readers) from the story were allowed to finish the task; the task was stopped for non-reader students (those who could not read at least 5 words in 30 seconds) after 30 seconds. Fluency was measured by calculating the number of words a student could read correctly in 60 seconds. For the reading comprehension task, students were asked 10 questions from the reading subtask, which included seven literal questions and three inference questions. Other subtasks are described in Table 2 below which defines each variable that was used in the study and how it was measured.

¹¹ Gove, G. & Wetterberg, A. 2011. The Early Grade Reading Assessment: Applications and Interventions to Improve Basic Literacy. RTI: Research Triangle Park, NYC.

TABLE 2: EGRA READING OUTCOME VARIABLES AND DEFINITIONS

OUTCOME VARIABLES	DEFINITIONS
Letter Identification	The number of letters (out of all 50 letters of the Bangla alphabet) for which the child either correctly gave the name, the sound, or a word that begins with that letter.
Most Used Words	The number of words (out of 20 of the most frequently used words in children's textbooks) correctly read aloud by the child.
Similar Beginning Sounds	The number of similar beginning sounds detected (from a Bangla textbook) correctly from a set of 3 words out of which 2 words have a similar beginning sounds. There were a total of 10 sets of similar beginning lines used in the evaluation.
Ending Rhyme in Words	The number of ending rhymes detected (from a Bangla textbook) correctly from a set of 3 words out of which 2 words correspond with the same ending rhyme. There were a total of 10 sets of ending rhyme lines used in the evaluation.
Pseudo Words ¹²	The number of nonsense words (out of 20) correctly read aloud by the child, as a test of children's decoding skills.
Antonyms ¹³	The number of antonyms given (for 10 words from a grade II and grade III Bangla textbook) correctly by the child.
Sentence Making ¹⁴	The number of words (out of 8 words from a grade III Bangla textbook) appropriately used to make a sentence by the child.
Reader	A child who can read the oral reading passage independently, defined as reading at least 5 words correctly in the first 30 seconds of the sub-test. Readers were allowed to continue reading until they finished the passage or refused to read any further; non-readers were stopped and read the passage by the assessor.
Fluency	Tested during the oral reading passage sub-test, fluency is defined as the number of words read correctly per minute.
Accuracy	Tested during the oral reading passage sub-test; the percentage of the total words read correctly by students from the passage.
Comprehension	Children's ability to correctly answer 10 questions following the administration of the oral reading passage sub-test.
Readers with Comprehension	Children who qualified as readers and answered at least 80% of reading comprehension questions correctly. This is a binary variable that includes all children in the sample, similar to the Reader variable. Here, reading comprehension is 1 if the child was a reader and answered at least 80% of comprehension questions correctly and 0 otherwise, including non-readers.

Selection and Training of Enumerators

Data collection of the endline study was carried out and supervised by a third party independent research firm- Data Management Aid (DMA), to maintain impartiality of the survey. All of the enumerators were recruited by DMA from a pool of experts, skilled in EGRA and the use of tablets to collect data. In total, 36 enumerators were recruited, including 6 experienced supervisors. A 5-day long training session was arranged for enumerators, supervisors and the quality controller. In the training session, the questionnaires for the 2 grades were described and multiple mock tests were conducted to make sure that enumerators' understanding of the questionnaire was clear and they were able to use the tablets proficiently. They were also given training on child safeguarding and

¹² Pseudowords were only used in the baseline assessment of grade III.

¹³ Antonyms were only used in the baseline assessment of grade III.

¹⁴ Sentence-making was only used in the baseline assessment of grade III.

guidelines on how to interact with children. Enumerators were trained by SCI staff with support from DMA. There were 2 experts from the Institute of Education and Research (IER) department of University of Dhaka, who shared their knowledge and valuable experience during training. A field testing was also conducted to provide practical experience for the enumerators and to assess their capacity to conduct data collection for such a study.

Data Collection

Before conducting this study, formal approval was received from District and Upazila Education office. As the study was conducted in schools with students of grades II and III, who are minors (<18 years of age), informed consent from the Head Teacher was taken, along with verbal assent of all interviewed students. Respondents were informed about the objective of the study, their roles in the study and their freedom of participation. Respondents were given unique ID numbers to maintain anonymity. Confidentiality of the data was maintained to the highest regard.

In total, 30 enumerators and 6 field supervisors collected data. The assessment was conducted on the school premises outside of the classroom to minimize distractions and to prevent other participants from learning information that might influence their responses in their respective interviews. The data collection took place between March 18, 2018 and April 3, 2018. Enumerators used tablet devices to collect data using KoBoToolbox¹⁵. Enumerators uploaded data to the KoBoToolbox interface at the end of each day. To ensure data validity, a ‘high frequency check’ was conducted daily to ensure that incoming data met the required criteria. After all data were collected, a database expert cleaned and prepared the datasets. Data compilation and cleaning were supervised by DMA. In addition, data were sent to SCI for further checking.

Data Analysis

The data analysis employed several different statistical models. For EGRA variables, difference in differences (DiD) analysis was executed to measure the progress in comparison to baseline data. Multiple regression analyses were used to explore the significant differences between comparison groups and intervention groups, as well as differences between baseline and endline results for both groups. In addition, Pearson’s r was performed to uncover relationships between selected variables in the comparison and intervention groups. The variables that were used for the analyses are summarized in Table 3.

TABLE 3: KEY VARIABLES	
SOCIO-DEMOGRAPHIC VARIABLES	EDUCATION BACKGROUND VARIABLES
<ul style="list-style-type: none"> ● Age ● Sex ● Number of family members ● Household assets 	<ul style="list-style-type: none"> ● ECD (pre-primary education) ● Change of School ● Grade repetition
HOME LEARNING ENVIRONMENT VARIABLES	READING ASSESSMENT VARIABLES
<ul style="list-style-type: none"> ● Reading time ● House tutor ● Chores ● Story-telling and family members reading to the children and encouraging them to study ● Children seeing their family members read ● Availability of other reading materials 	<ul style="list-style-type: none"> ● Alphabet knowledge ● Identifying most used words ● Detecting similar beginning sounds ● Detecting rhyming sounds ● Vocabulary (most used words in grade level Bangla book) ● Reading fluency ● Reading accuracy ● Reading comprehension

¹⁵ Kobotoolbox is an open source data collection tool it is used both in offline and online version and data is stored in the Kobo server.

CHAPTER 3: LEARNER CHARACTERISTICS: SCHOOL AND HOME ENVIRONMENT

BACKGROUND CHARACTERISTICS

Age

At the time of the baseline study, grade II students from both READ schools and comparison schools reported of being 7-8 years old (70%) and grade III students reported of being 8-9 years old (69%). At the time of the endline study, the reported age range was similar to baseline, 7-8 years old for grade II students (81%) and 8-9 years old for grade III students (74%). The ages reported by the students are typical for their respective grade levels. There was no age difference among the 2 grades found in baseline and endline.

Socioeconomic Status

The study showed that there were no significant differences in socioeconomic status between comparison and intervention groups. Respondents were asked about family ownership of assets (electricity, refrigerator, TV, cow, goat, hen/duck, land, bicycle and motorcycle). The results showed that for both baseline and endline studies, most students' families owned a hen/duck, around 78% owned land, and they lived in houses made of tin, brick (versus sturdier materials such as pucca (a type of brick), semi-pucca, tin or wood). Less than a quarter of respondents reported of owning more expensive assets such as TV, bicycle or motorcycle. More than 86% of the total sample reported having electricity at the endline which is an increase from the baseline; this surge in electricity ownership may be explained by an increase in access to electricity in the 6 divisions since the baseline study was conducted in 2015.

HOME ENVIRONMENT

Chores

More than 95% of students in both intervention and comparison groups reported doing chores. Students from both grades reported doing cooking/cleaning and helping household members (i.e. caring for young children and the elderly) more than doing other chores. Students appeared to do similar types of chores, regardless of grade and exposure to READ intervention in both baseline and endline. Chores done by male and female students of both grades were slightly different; female students reported of doing cooking, cleaning, and helping out in household works more, while male students were more involved in farming, taking care of cattle's and working in market/shop. These differences were between 3% and 16%.

Students were likely to spend approximately 35 minutes on chores in the morning, regardless of grade and intervention status. Afternoons are the least popular chore time, presumably because students are attending school during this time. The length of time spent doing chores increases as students grow older. These findings are critical to understand the background factors that can impact academic performance as studies have shown that too much time spent doing chores is a strong negative predictor of academic achievement¹⁶.

¹⁶ Reich, Jodi, Sascha Hein, Suzanna Krivulskaya, Lesley Hart, Nina Gumkowski, Elena L. Grigorenko, and The Learning Disabilities Project. "Associations between household responsibilities and academic competencies in the context of education accessibility in Zambia." *Learning and individual differences* 27 (2013): 250-257.

Home Literacy Environment

To gain an understanding of student' home literacy environment, students were asked about their family members' involvement in reading, helping them (the students) to study and reading and telling stories to them.

Family Members Reading

Overall, most students of both READ schools and comparison schools reported seeing family members read. For intervention groups, there was a slight increase in family members' involvement in reading from baseline to endline. Nearly 55% of students across all grades in READ schools reported seeing family members read at endline .

Family Member Involvement in Studying and Reading

Studies have demonstrated that children who read with parents or other adults tend to have a richer vocabulary than children who do not read with parents/other adults. Results were similar for intervention and comparison groups as approximately 90% of all students reported of receiving help from family members at both baseline and endline. These results indicate that families are highly invested in their children's education and that focusing on family members for early grade education programs may facilitate children's learning.

EDUCATION HISTORY AND SITUATIONAL FACTORS

Pre-Primary Education, Grade Repetition and Change of School

Approximately 72% of students of grades II and III reported attending pre-primary school at the endline (see Table 4)¹⁷. There was a slightly lower percentage of pre-primary attendance at intervention schools, which could be attributed to the fact that a greater number of intervention schools (25% in total) than comparison schools were located in more remote areas (Sunamganj, Manikganj and Nilphamari) and did not have access to pre-primary education. These findings are particularly important, as studies have shown that Early Childhood Development (ECD) through pre-primary education has long-lasting, positive effects on academic achievement¹⁸.

Grade repetition was found to be lower in READ schools than comparison schools for both grades II and grade III. In grade II, grade repetition was 20% among students in READ schools and 28% among students in comparison schools. In grade III, 27% of READ school students reported of repeating a grade, compared to 32% of comparison school students. More students from comparison schools in both grades reported changing schools than students in READ schools (24% and 27% of READ school students in grades II and III respectively compared to 29% and 37% of comparison group students in grades II and III respectively).

¹⁷ Results are shown for endline only, as baseline results are similar.

¹⁸ Magnuson, Katherine A., Christopher Ruhm, and Jane Waldfogel. "The persistence of preschool effects: Do subsequent classroom experiences matter?." *Early Childhood Research Quarterly* 22, no. 1 (2007): 18-38.

TABLE 4: EDUCATION HISTORY (ENDLINE ONLY)

	GRADE II		GRADE III	
	Intervention	Comparison	Intervention	Comparison
ECD ATTENDANCE	68%	76%	70%	75%
GRADE REPETITION	20%	28%	27%	32%
CHANGE OF SCHOOL	24%	29%	27%	37%

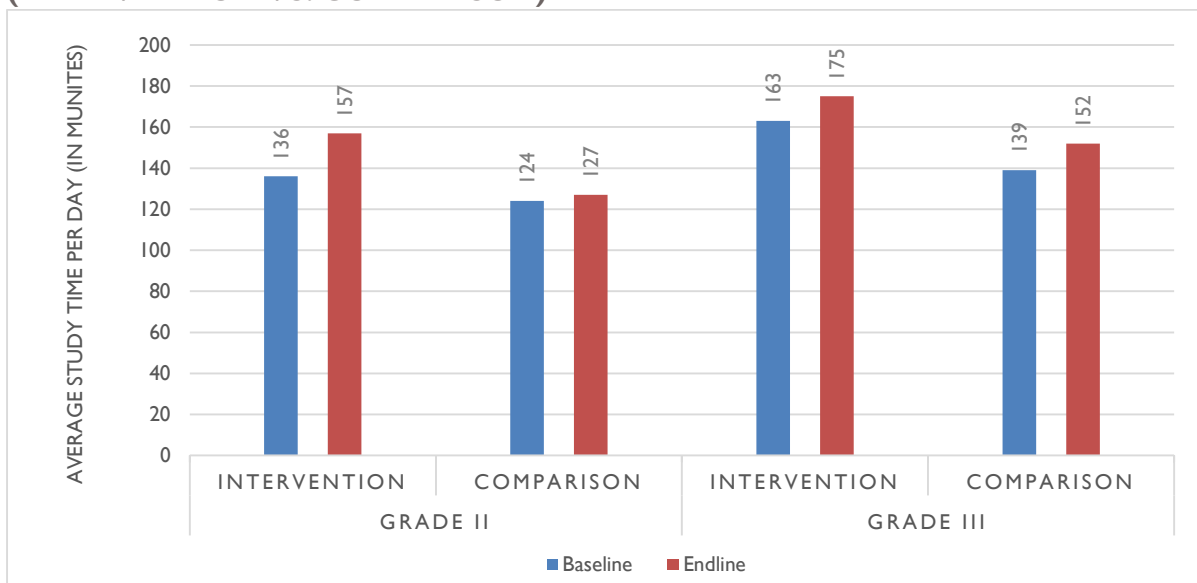
Closed and Missed Days

At the endline study, the reported average number of closed school days in the week prior to data collection was 2 days; there were two government holidays in the month of March. The result was similar across all groups. More than 50% of students reported missing school and almost half attributed their absence to illness. Fewer than 25% of students missed school for work, an outing or because they were looking after unwell family members.

Average Study Time

The endline study showed that students in READ schools reported studying longer than students in the comparison schools (see Figure 2). This was a clear shift from the baseline, in which comparison groups reported of longer study times than the intervention groups. At the time of the endline study, grade II and grade III students in the intervention group reported studying 30 minutes and 23 minutes (on average) more per day, respectively, compared to grade II and grade III students in the comparison group. This may indicate that participating in the READ program can affect student study time; however, further research is needed to understand the impact of the READ program on individual study habits.

FIGURE 2: AVERAGE STUDY TIME PER DAY (IN MINUTES): GRADES II AND III (INTERVENTION VS. COMPARISON)

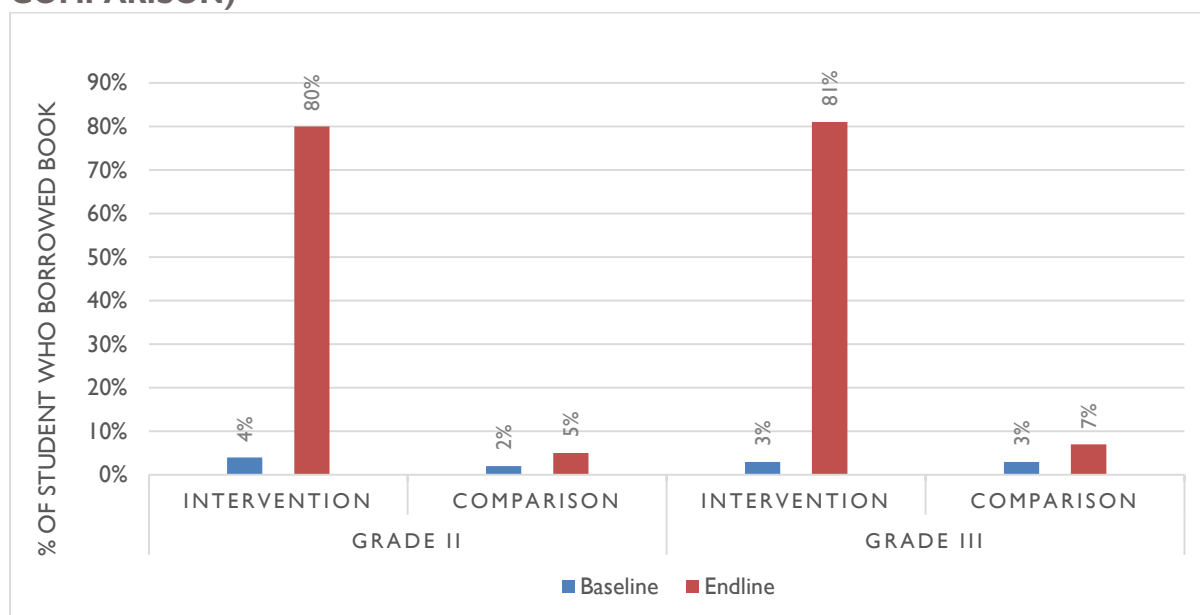


READING HABITS

Borrowing a Library Book

Students in the READ schools were more likely to borrow books from the library than students in the comparison schools¹⁹. The baseline study showed that fewer than 5% of students in both intervention and comparison groups reported borrowing a library book. However, at the time of the endline, the intervention groups reported a much higher percentage of borrowing books from the library/book corner than at the baseline; 80% of grade II and 81% of grade III intervention students reported borrowing a library book (see Figure 3 for complete results). On average, only 6% of students in the comparison group for both grades reported borrowing a library book at the endline. These results may indicate that the access to library books that the READ program provided had a positive impact on students' interest in borrowing books; in other words, when there is access to library, students are more likely to borrow books.

FIGURE 3: PERCENTAGE OF STUDENTS WHO BORROWED A BOOK FROM A LIBRARY/BOOK CORNER: GRADES II AND III (INTERVENTION VS. COMPARISON)



Reading a Library Book

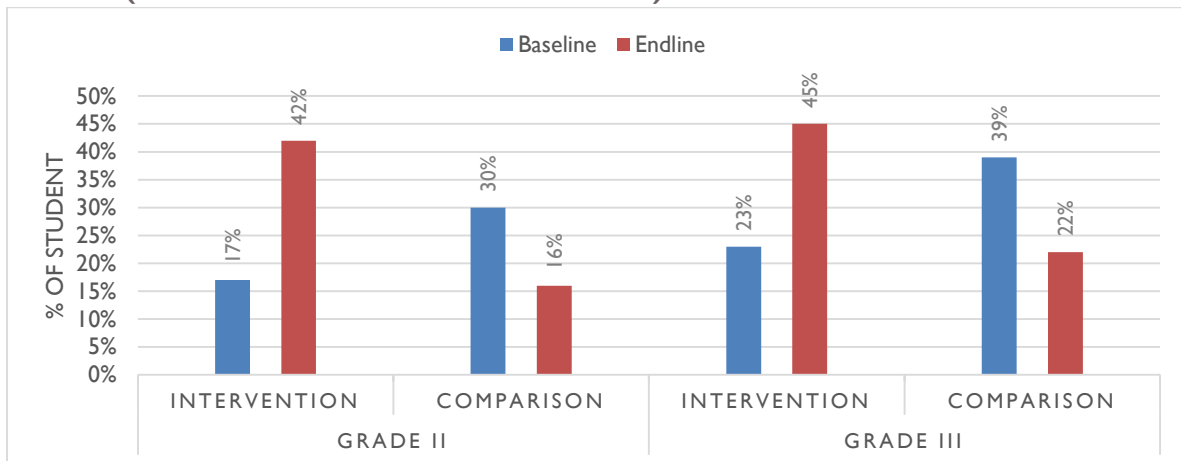
Among the students who borrowed a book from the library, very few reported reading the borrowed books. Only 11% of grade II and 12% of grade III students in READ schools reported having read the borrowed book at endline; fewer than 1% of students in both grades in comparison schools reported having read the borrowed books.

Students Who Read With Peers

Students at READ schools were more likely to read with peers. At the time of the endline, twice as many students in READ schools reported of reading with peers than students in comparison schools for both grades (see Figure 4). Clearly, this is a large difference in peer reading between comparison and intervention groups. Reading together not only allows students to decode texts jointly, but it also fosters motivation for reading – both of which can positively impact reading achievement.

¹⁹ All intervention schools had access to book corner/library (supported by READ Project), whereas not all comparison schools had access to a library though many did.

FIGURE 4: PERCENTAGE OF STUDENTS WHO READ WITH PEERS: GRADES II AND III (INTERVENTION VS. COMPARISON)



Activities to Improve Reading Skills

The READ program altered the method of how students improved their reading skills; when students were given examples of some techniques to improve their reading, only students in READ schools at the endline reported using decoding techniques to help them improve their reading skills. The baseline results showed that students looked for support from their teachers and family members and used books to improve their reading abilities. Less than 15% of the baseline sample utilized decoding as method of improving reading skills. These results were similar for both grades and for both intervention and comparison groups. The endline study showed similar percentages to the baseline results for both groups in utilizing family members, teachers and textbooks to improve reading skills. However, the most dramatic difference was that the students in the intervention group reported utilizing decoding techniques to improve their skills. On average, 71% of the intervention group in both grades reported that they used decoding, compared to 59% in the comparison group. It is important to note that the comparison group also reported using decoding more than baseline, even though it was a small percentage. This increase observed in both groups could be attributed to an improvement in the teaching and learning of reading skills in schools during the time between the baseline and endline studies.

CHAPTER 4: READING RESULTS

In order to determine the effect of USAID's READ project on the intervention groups, a statistical regression model was used to determine if there was a relationship between reading skills (letter knowledge, most used words, similar beginning sounds, rhyming words, reader, comprehension, fluency, accuracy) and intervention status (READ school or comparison school), when controlling for factors, such as, age, socioeconomic status, home literacy environment, preschool attendance, and gender.

EMERGING LITERACY SKILLS

Emerging, or lower order, literacy skills refer to the foundational skills that students need to learn to be able to read, including the ability to identify the letters of the alphabet, the ability to identify written words they use on a regular basis, the phonemes that compose a word, and their knowledge of vocabulary words and antonyms. The following section explores the intervention and comparison group results on tasks that assess these skills.

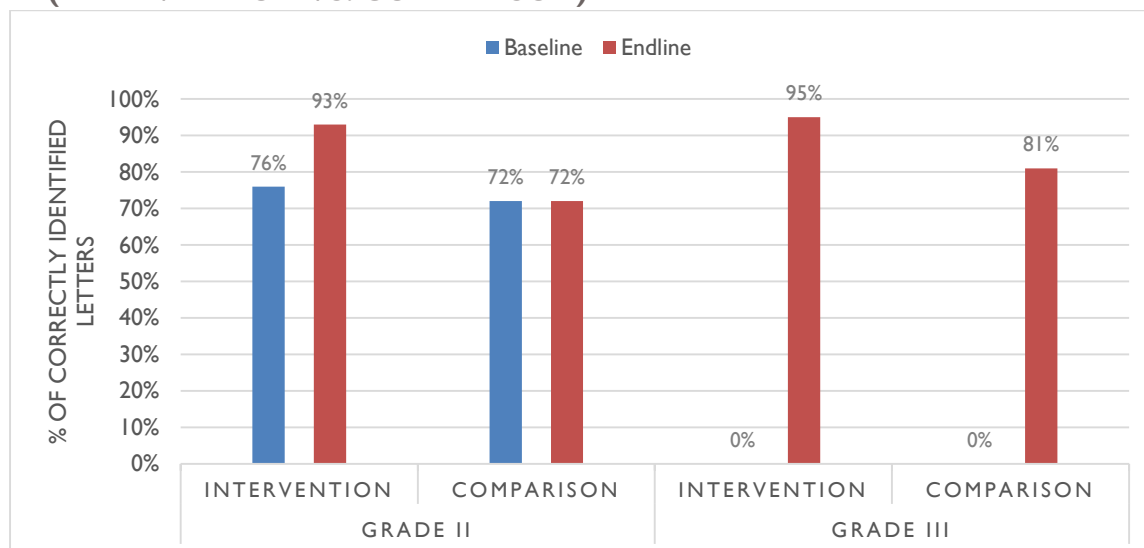
Letter knowledge

In the letter identification subtask, students were asked to read aloud 50 letters of the Bangla alphabet. The full set of letters was listed in a random order to prevent reciting a memorized alphabet. This was done also to test actual automaticity of letter recognition and translation from print to sound.

Students in READ schools scored higher on the letter knowledge task than students in comparison schools at the endline and the differences were significant at $p < 0.01$ for grade II students. Figure 5 below shows the increase in scores for grade II (both intervention and comparison groups). This task was not administered to grade III students at the baseline; thus, there is no comparison data from baseline to endline. In the endline, grade III students in the comparison group achieved 81% accuracy in identifying letters, compared to grade III intervention group students who scored 95% on the task.

In the baseline study, grade II students in the comparison group scored 72% while the grade II intervention group scored 76% on the same task. In the endline, grade II students in the comparison group scored 72%, showing almost no improvement. However, grade II students in the intervention group scored 93%, demonstrating a noticeable increase in ability to identify letters. The increase that grade II and III intervention groups demonstrated on this task is promising in terms of early grade literacy development; early mastery of this skill will aid students in becoming proficient and fluent readers.

FIGURE 5: PERCENTAGE OF LETTERS IDENTIFIED CORRECTLY: GRADES II AND III (INTERVENTION VS. COMPARISON)



Most Used Words (Vocabulary)

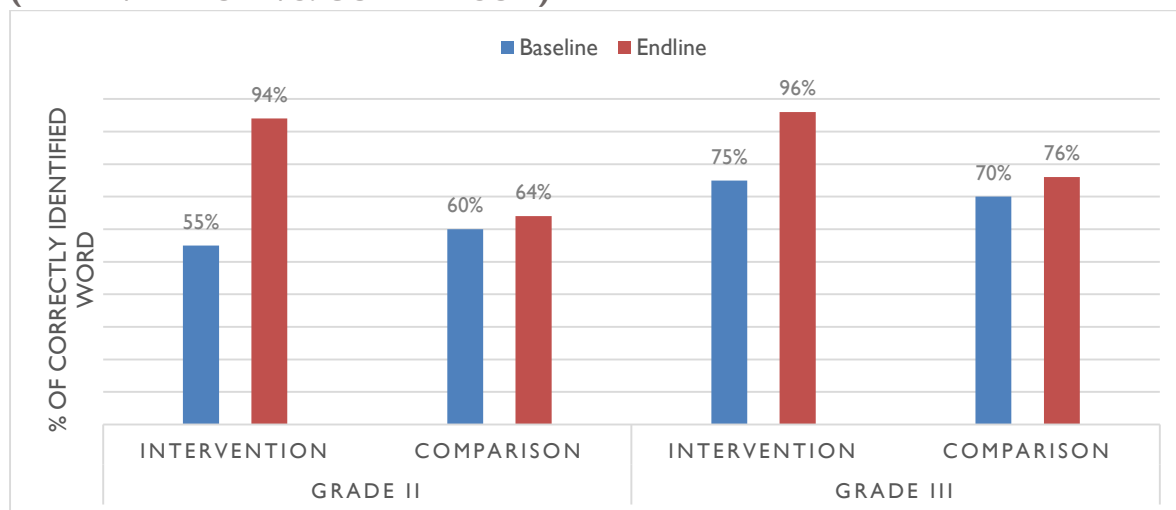
In the familiar word reading subtask, students were asked to read 20 words selected from the Bangla reading material. This subtask is meant for assessing sight recognition skills – decoding skills of the most frequent (sight²⁰) words.

Students in READ schools scored better on the most used words task than students in comparison schools at the endline, and the differences were significant at $p < 0.001$ for grade II and at $p < 0.01$ for grade III. Students' ability to read most frequently used words was assessed for the two grades. Figure 6 shows the increase in scores for both grades by intervention and comparison group. For grade II students in the comparison group, scores increased from 60% correct in the baseline to 64% in the endline. For the grade II intervention group, scores increased from 50% correct in the baseline to 94% correct in the endline. For grade III students in the comparison group, scores increased from 70% correct in the baseline to 76% correct in the endline. For grade III students in the intervention group, scores increased from 75% correct in the baseline to 96% correct in the endline.

These results show very minimal improvements for the comparison group from baseline to endline but large improvements for both grades in the intervention group. The largest percentage increase (55% from baseline to 94% in endline) for the grade II intervention group demonstrates that the READ program may have influenced vocabulary acquisition and identification, for grades II students in particular.

²⁰ Words that primary school students should recognize on sight, as many of these words are not easy to pronounce and thus must be memorized.

FIGURE 6: PERCENTAGE OF MOST USED WORDS CORRECT: GRADES II AND III (INTERVENTION VS. COMPARISON)



SIMILAR BEGINNING AND RHYMING WORDS

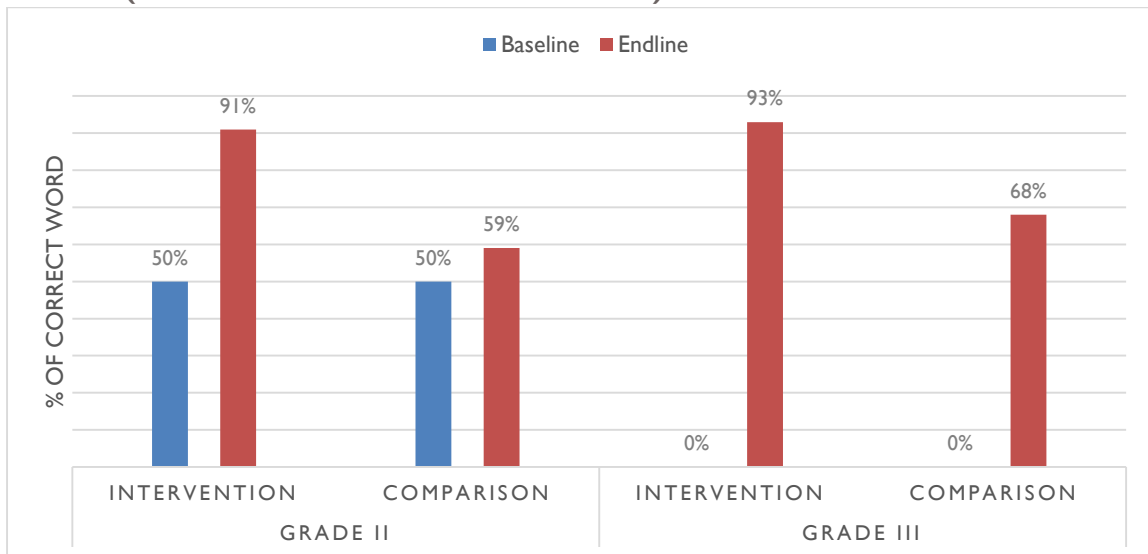
Similar Beginning Words

For this test, the assessor read aloud three words, asking the student to identify the pair of words with similar beginning (onset) sounds. A total of 10 sets of similar beginning words were provided to the students for this task. This task assesses a student's phonemic awareness.

Students in READ schools scored higher on the similar beginning words task at the endline than students in comparison schools, and the differences were significant at $p < 0.001$ for grade II. Grade II students in the comparison schools did not demonstrate substantial differences in scores from baseline to endline (50% at baseline and 59%, at endline). However, the grade II students in the READ schools showed a large increase from 50% at the baseline to 91% at the endline. This task was not administered to grade III students at the baseline; thus, there is no comparison data for this group. Still, the endline study showed a difference in scores at the endline between the students in the comparison and READ schools; the comparison group recognized 68% of similar rhyming words, while the intervention group recognized 93% of the words (see Figure 7).

These results show very minimal improvements for the comparison group from baseline to endline but show great improvements for both grades in the intervention group. The high scores among intervention students show that they are acquiring phonemic awareness, which is a critical emergent literacy skills.

FIGURE 7: PERCENTAGE OF SIMILAR BEGINNING WORDS CORRECT: GRADES II AND III (INTERVENTION VS. COMPARISON)

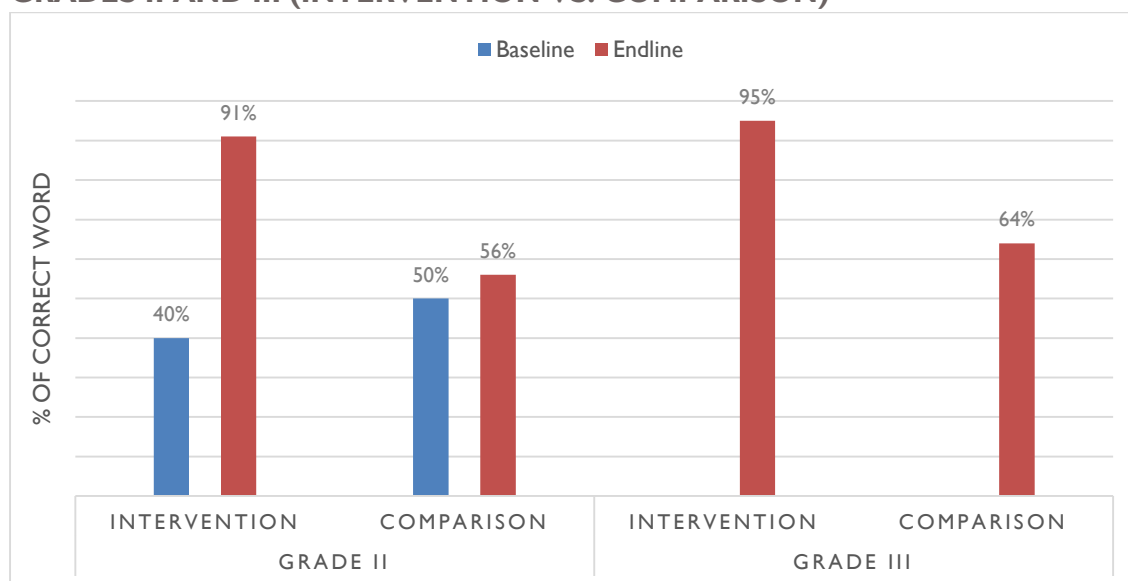


Rhyming Words

For this test, the assessor read aloud three words, asking the student to identify the pair of words with similar ending sounds. A total of 10 sets of end rhyming words were provided to the students for this task.

Students in READ schools scored higher on the rhyming words task in the endline than students in comparison schools and the differences were significant at $p < 0.01$ (see Figure 8). In grade II, students in comparison schools scored similarly in the baseline (50% correct) and in the endline (56% correct). However, the endline results showed a large increase in scores on the rhyming word task for grade II students in READ schools (from 40% at baseline to 91% at endline). This task was not administered to grade III students in the baseline; thus, there is no time comparison data for this group. However, there was still a noticeable difference in scores between comparison and READ schools at the endline. Students in comparison schools recognized 64% of rhyming words correctly, while the students in READ schools recognized 95% of words correctly.

FIGURE 8: PERCENTAGE OF SIMILAR ENDING/RHYMING WORDS CORRECT: GRADES II AND III (INTERVENTION VS. COMPARISON)

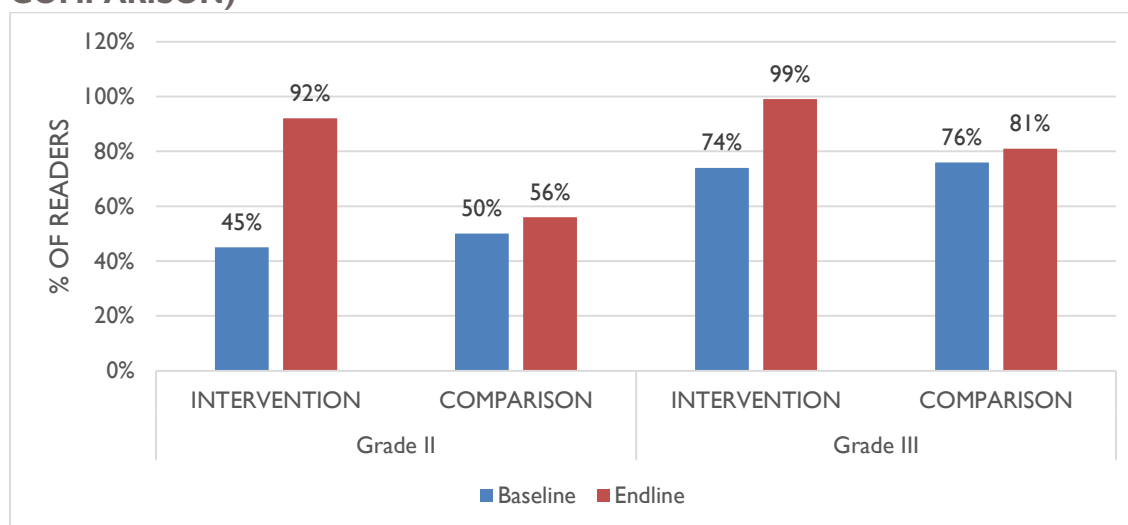


Reader VS. Non-Reader

A reader is defined as a child who can read the oral reading passage independently, which is measured by the ability to read at least 5 words correctly in the first 30 seconds of the sub-test. Readers were allowed to continue reading until they finished the passage or refused to read any further; non-readers were stopped and the assessor read the passage to them.

There were more readers in READ schools than in comparison schools at the endline. At the endline, about 56% of grade II students in the comparison group were classified as readers while 92% of grade II students in READ schools were readers. For grade III students, roughly 81% of the comparison group students were classified as readers, compared to 99% students in READ schools. Figure 9 shows the percentage of readers in both comparison and intervention groups at the baseline and the endline in both grades. The district-wise change in percentage of non-reader is presented in Tables 29 and 30.

FIGURE 9: PERCENTAGE OF READERS: GRADES II AND III (INTERVENTION VS. COMPARISON)



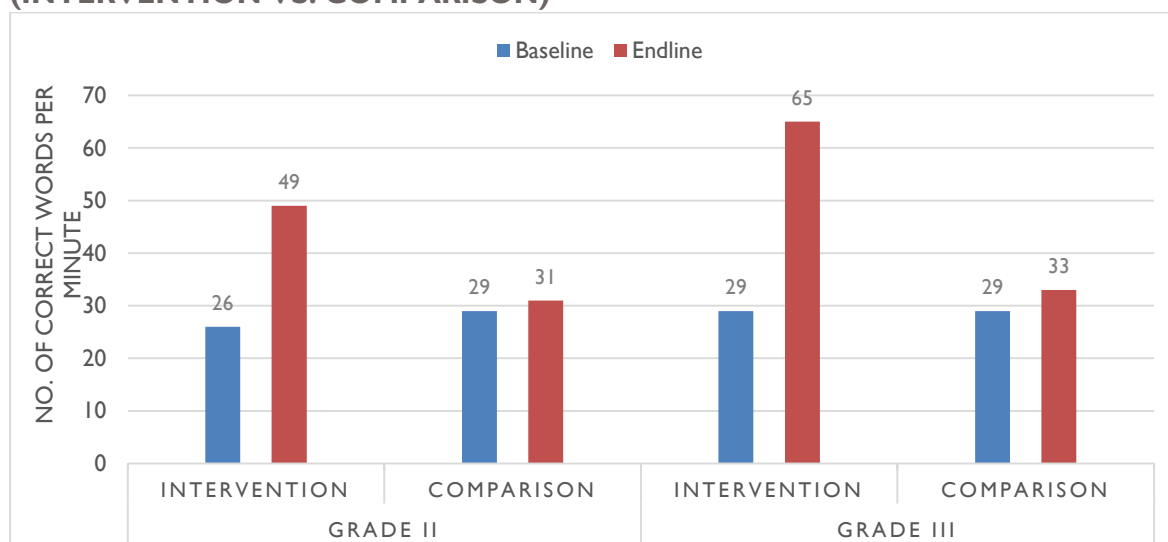
Higher Order Literacy Skills

Higher order literacy skills are the skills that students develop once they are independent readers, such as the ability to read with fluency, accuracy, and comprehension. For the purposes of this study, the following sub-task was only given to students who were classified as independent “readers”, meaning they were able to decode at least 5 words in the first 30 seconds of attempting to read the fluency passage.

FLUENCY (WORDS PER MINUTE)

Even though only the readers were allowed to continue reading the story, fluency achievements were calculated for all students (both readers and non-readers). Fluency rates were higher for students in READ schools than those in comparison schools and the improvements in results from baseline to endline are significant at $p < 0.001$. For measuring reading fluency, the number of words read correctly per minute was calculated among the readers. Figure 10 shows the fluency scores for students in comparison and READ schools. In both grades, the endline scores for students in the READ schools were higher than the endline scores of the students in comparison schools. However, fluency scores still showed room for improvement, particularly for grade II students.

FIGURE 10: FLUENCY SCORES (WORDS PER MINUTE): GRADES II AND III (INTERVENTION VS. COMPARISON)



To further elaborate the reading fluency, during baseline survey, only 6% grade II and 22% grade III students in treatment schools had fluency of more than 45 words per minute (please see, Table 5). Majority of the grade II students of both groups could not read any word at the baseline. As mentioned previously, by the time of endline, reading fluency significantly improved among READ school students. More than half the students of grade II (52%) and grade III (70%) of treatment schools could read more than 45 words per minute.²¹ Control group students also showed noticeable progress from baseline to endline.

²¹ Although no benchmarks exist for Bangladesh, global research suggests that to understand a simple passage given the capacity of short-term memory, average students should read with a minimum fluency rate of 45-60 words per minute. Source: Abadzi, Helen. "Reading Fluency Measurements in EFA FTI Partner Countries: Outcomes and Improvement Prospects." Global Partnership for Education. September 2011.

TABLE 5: FLUENCY SCORE BY CATEGORY- GRADE II & III

Grade II								
Fluency category	Baseline				Endline			
	Treatment		Control		Treatment		Control	
(WPMC)	N	%	N	%	N	%	N	%
Zero word	169	48%	113	47%	13	3%	102	27%
I to 10 words	23	7%	18	7%	27	7%	74	19%
11 to 44 words	136	39%	87	36%	142	37%	51	13%
≥45 words	21	6%	24	10%	198	52%	158	41%
Grade III								
Fluency category	Baseline				Endline			
	Treatment		Control		Treatment		Control	
(WPMC)	N	%	N	%	N	%	N	%
Zero word	45	13%	38	9%	8	2%	57	15%
I to 10 words	38	11%	22	54%	8	2%	30	8%
11 to 44 words	195	55%	130	21%	98	26%	174	45%
≥45 words	77	22%	50	16%	269	70%	124	32%

Accuracy

Students in both READ and comparison schools scored well on reading accuracy, though students in READ schools scored significantly better at the endline at $p < 0.001$. For measuring reading accuracy, the percentage of words read correctly in the oral reading passage was calculated (out of 76 words for grade II and 85 words for grade III) among the readers. At the baseline, grade II students in READ schools scored 75%, while students in comparison schools scored similarly at 77%. At the endline, grade II students in READ schools scored 97% whereas students in comparison schools scored 92%. At the baseline, grade III students in READ schools scored 70%, while students in comparison schools scored similarly at 73%. At the endline, students in READ schools scored 99% whereas students in comparison schools scored 81%.

Comprehension

Ten comprehension questions were administered for all students, regardless whether they were reader or non-reader. Readers answered the questions after reading the story by themselves; it was considered as reading comprehension. The story was read once to the non-readers and then the comprehension task was administered; it was identified as listening comprehension. For measuring comprehension, the percentage of comprehension questions answered correctly was calculated. Students in READ schools scored better in the comprehension task (both reading and listening) than students in comparison schools at the endline and the differences were significant at $p < 0.001$.

Figure 11 and 12 show the comprehension scores of readers (reading comprehension) and non-readers (listening comprehension) in the comparison and intervention groups for both grades. In all grades, the endline comprehension scores of the students in READ schools were higher than the endline scores of students in the comparison groups. While baseline scores amongst comparison and intervention groups show almost similar results, the endline scores show vast improvements for READ school students compared to the baseline results.

FIGURE 11: COMPREHENSION SCORES OF READERS VS. NON-READERS: GRADES II (INTERVENTION VS. COMPARISON)

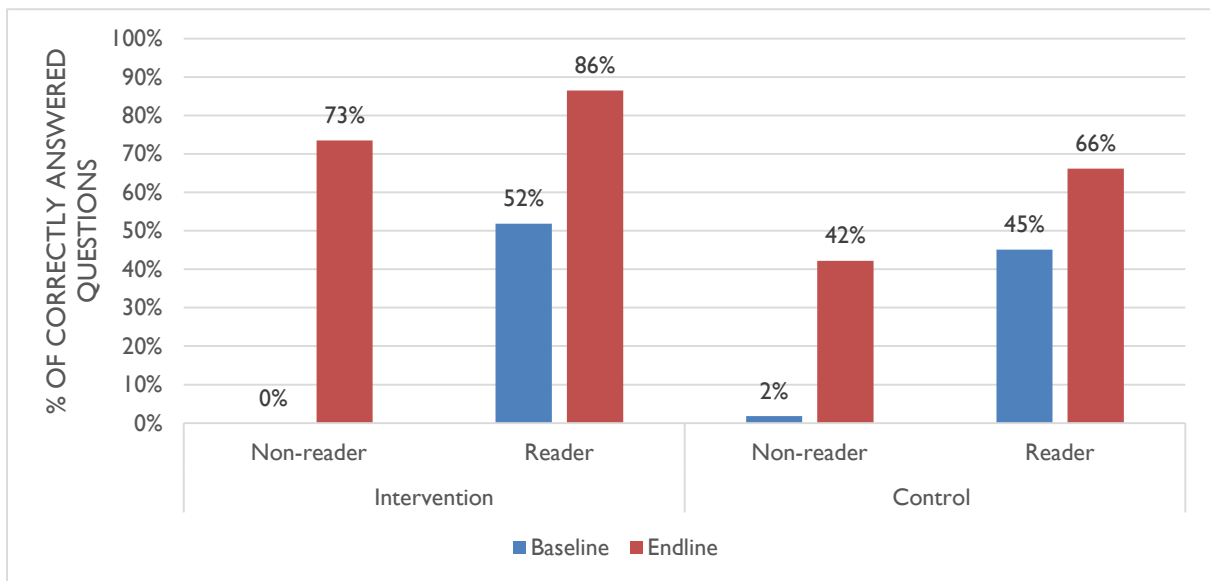
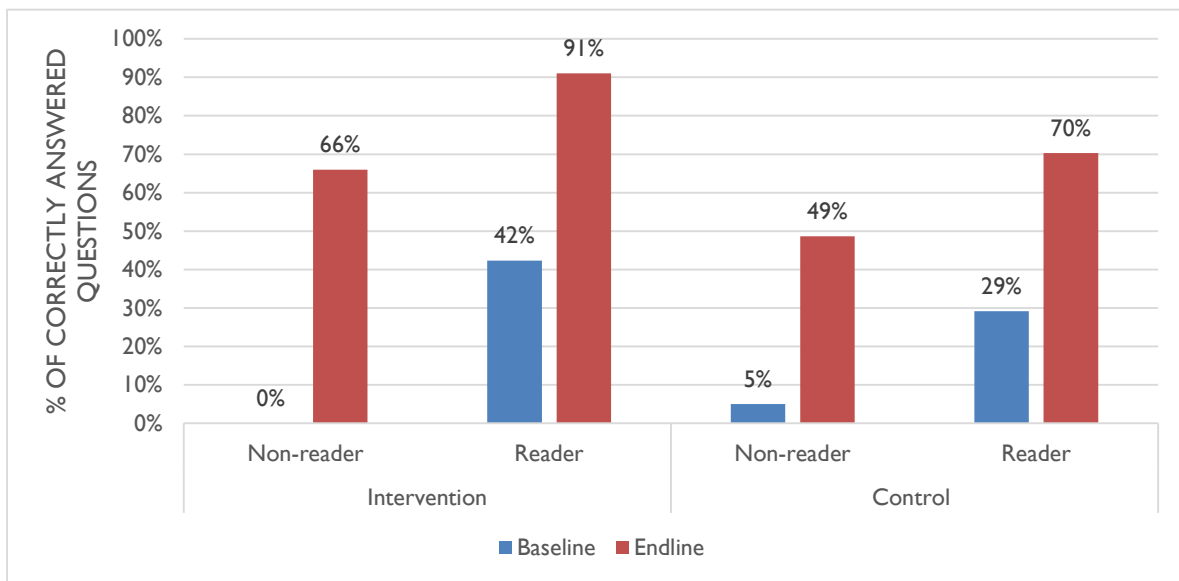


FIGURE 12: COMPREHENSION SCORES OF READERS VS. NON-READERS: GRADES III (INTERVENTION VS. COMPARISON)



Students with comprehension

Students who answered at least 8 of the 10 comprehension questions correctly were considered to have be students with comprehension. Students in READ schools were more likely to have better comprehension than students in comparison schools.

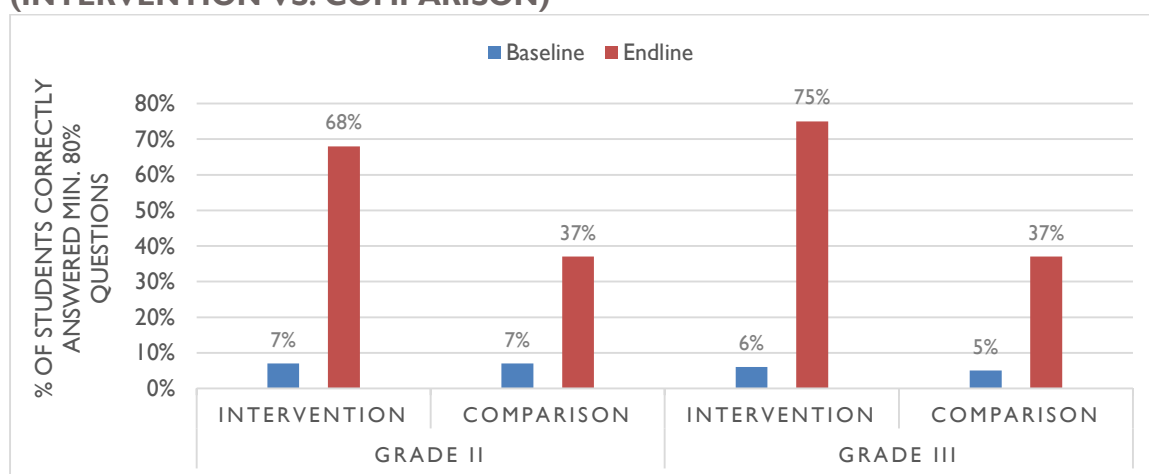
At the baseline, no non-reader student from any grade of treatment schools could answer more than 4 comprehension²² questions correctly, while at the endline 97% of grade II and 100% of grade III non-reader students could answer more than 4 comprehension questions (see Tables 27 and 28

²² Listening comprehension

of Annex A). Comprehension²³ scores were better among readers, compared to non-readers, and at endline, majority of the readers (69% grade II and 76% grade III) could correctly answer at least 8 comprehension questions, which was only 15% and 8% respectively at the baseline. Similar to all other reading tasks, control school achievements of comprehension was poorer compared to READ schools.

Figure 13 shows the difference between comparison and intervention groups in the percentage of students reading with comprehension²⁴. The percentage of grade II students with reading comprehension in READ schools increased from 7% to 68% from the baseline to endline, compared to the comparison group, which increased from 7% to 37%. The percentage of grade III students in READ schools who could read with comprehension increased from 6% to 75% from the baseline to endline, compared to the comparison group increase from 5% to 37%.

FIGURE 13: STUDENTS WITH READING COMPREHENSION: GRADES II AND III (INTERVENTION VS. COMPARISON)



The results demonstrate that in addition to having a positive and significant impact on lower order reading skills, the READ program seems to have a substantial impact on improving higher order thinking skills.

Higher Order Literacy Skills: Difference of Means between Comparison and Intervention Groups by Grade over Time

Table 6 shows the significance in mean difference between the comparison and intervention groups for each grade at the baseline and endline studies for higher order literacy skill tasks. The baseline results for each skill show similar percentages for both comparison and intervention groups with a few exceptions, in which the comparison group scored slightly better than the intervention group. These differences may have randomly occurred as they are not consistent with the other higher order literacy skill results in their respective grades. In the endline study, when controlling for background characteristics such as SES, gender, etc., intervention groups in both grades scored better than the comparison groups for all higher order literacy skill tasks (accuracy, fluency and comprehension with a significance of $p < 0.001$).

²³ Reading comprehension

²⁴ Percentage of students with Reading Comprehension = (Total number of students with reading comprehension / Total number of students) × 100

TABLE 6: GRADE II AND III HIGHER ORDER LITERACY: DIFFERENCE BETWEEN MEANS COMPARISON VS. INTERVENTION

GRADE II		BASELINE				ENDLINE			
Variable Name	I	C	p-value	SS	I	C	p-value	SS	
Accuracy (% correct)	75	77	<0.05*	348	97	92	0.00***	564	
Fluency (in wpm)	26	29	0.91	335	53	45	0.00***	564	
Reading Comprehension ²⁵ (% student)	7	7	0.43	349	68	37	0.00***	564	

GRADE III		BASELINE				ENDLINE			
Variable Name	I	C	p-value	SS	I	C	p-value	SS	
Accuracy (% correct)	70	73	0.68	485	99	81	0.00***	645	
Fluency (in wpm)	29	29	0.43	467	65	50	0.00***	645	
Reading Comprehension ²⁶ (% student)	6	5	<0.05*	485	75	37	0.00***	645	

Coefficients are significant at p<0.05(*) and p<0.001(***); I= Intervention, C= Control; SS= Sample Size.

It is also important to note that the increases seen in the comparison group from baseline to endline were statistically significant.

Correlations between Reading Skills, Reading Behavior and Literacy Outcomes

Using the Pearson’s r to determine correlation, relationships between reading skills and behavior and literacy outcomes were identified. Table 7 shows the correlation coefficients and levels of significance for the relationship between fluency and comprehensions as well as the relationship between borrowing books and reading comprehension. The scatterplot in Figure 14 and 15 shows that the students who could read more words per minute, responded to more comprehension questions correctly in treatment schools at Endline. Strong relationship was found between higher fluency and higher score in comprehension task among the grade II students at Endline survey in treatment schools. All the correlations for fluency and comprehension are statistically significant. These results are expected as research has demonstrated a link between fluency and comprehension; proficient reading fluency reading frees cognitive resources to enhance overall comprehension of reading texts²⁷.

²⁵ Percentage of students with Reading Comprehension= (Total number of students with reading comprehension/Total number of students)×100

²⁶ Percentage of students with Reading Comprehension= (Total number of students with reading comprehension/Total number of students)×100

²⁷ Sénéchal, Monique, and Jo-Anne LeFevre. "Parental involvement in the development of children’s reading skill: A five-year longitudinal study." *Child development* 73, no. 2 (2002): 445-460.

In regard to borrowing books and comprehension, there was no correlation found for grade II students at either the baseline or endline for either group. The grade III results show that there is no correlation between borrowing books and comprehension, except for the comparison group at the endline, which shows a weak positive relationship that is statistically significant. For grade III, there is a weak positive relationship that is statistically significant for both intervention and comparison groups at the endline. In addition, the grade III comparison group shows a very weak positive, but significant relationship at the baseline. As seen in the previous chapter, of all students who borrowed books, grade III students were most likely to read the borrowed book which may explain why there were statistically significant results for this group.

TABLE 7: CORRELATIONS BETWEEN FLUENCY/BORROWING BOOKS AND COMPREHENSION

	GRADE II				GRADE III			
	BASELINE		ENDLINE		BASELINE		ENDLINE	
	Intervention	Comparison	Intervention	Comparison	Intervention	Comparison	Intervention	Comparison
Fluency and Comprehension	0.4**	0.3**	0.3**	0.3**	0.3**	0.3**	0.3**	0.3**
Borrowing books and Comprehension	0.0	0.0	0.1	0.3**	0.0	0.1*	0.2**	0.2**

Coefficients are significant at $p < 0.05$ (*), and $p < 0.01$ (**).

Background Variables and Literacy Outcomes

Using the coefficients from the multi-level regression models, relationships between reading skills subtests and students' background information were identified. Table 8 presents these findings. These results demonstrate that students with a weak home literacy environment (defined as noticing fewer than 3 family members read) were more likely to perform worse on some emergent literacy tasks and higher order tasks, and the differences were statistically significant ($p < 0.001$). For grade II and III students, there were significant differences between the scores of similar beginning words and most used words among students with different home literacy environments. For grade II and III students, those with a strong home literacy environment demonstrated greater reading comprehension than students with a weak literacy environment. These findings, supported by a research study, suggest strong home literacy environments are a good predictor of literacy skills and vocabulary development²⁸.

Grade II students with no pre-primary education performed worse in similar beginning words task. Lastly, the results of the endline showed no significant difference in literacy achievement between students from high and low SES (except for comprehension for grade II students in which students of a higher SES scored better than students of a lower SES) or according to gender. This may be an indication that previous government and donor-led initiatives to address these issues have helped to

²⁸ Sénéchal, Monique, and Jo-Anne LeFevre. "Parental involvement in the development of children's reading skill: A five-year longitudinal study." *Child development* 73, no. 2 (2002): 445-460.

reduce inequalities in these two areas.

TABLE 8: DIFFERENCE IN LITERACY OUTCOMES BY BACKGROUND VARIABLES

	SOCIO-ECONOMIC STATUS	HOME LITERACY ENVIRONMENT	PREVIOUS ECD ATTENDANCE
GRADE II			
Similar beginning words	-	Weak home literacy ***	No ECD**
Most used words	-	Weak home literacy ***	-
Reading Comprehension	Low SES*	Weak home literacy ***	-
GRADE III			
Fluency	-	Weak home literacy ***	-
Reading Comprehension	-	Weak home literacy ***	-

Coefficients are significant at $p < 0.05$ (*), $p < 0.01$ (**) and $p < 0.001$ (***).

Intent-to-TREAT Effect on Students' Literacy SKILLS for GRADE ii and GRADE III

Table 9 and 10 below shows the difference in reading outcomes between the intervention and comparison groups. The results of this regression analysis demonstrate that there are significant differences in performance between the intervention and comparison group students in all reading outcomes at endline.

TABLE 9: DIFFERENCE IN LITERACY OUTCOMES BETWEEN INTERVENTION AND COMPARISON GROUPS FOR GRADE II

LITERACY OUTCOME	CONSTANT	COEFFICIENT	S.ERR	P-VALUE	N
Emergent Literacy skills					
% similar beginning words correct	22.85714	14.79037	1.71965	0.000	765
% ending rhyme in words correct	19.70588	14.19618	1.77953	0.000	765
% listening comprehension answered correctly by non-readers	-0.055	-0.05	0.05	0.000	154
Decoding					
% letter correct	35	17.55006	1.69174	0.000	765
% frequent/most used words correct	28.03737	17.57118	1.67031	0.000	765
Confirmation and fluency					
% of students who are self-reliant reader	43.5271	21.5909	1.91168	0.000	765
Accuracy score with missing for non-readers	0.013	0.007	0.01	0.005	1577
Fluency	6.388	1.006	2.53	0.000	1577
% of comprehension questions, correctly by readers	0.006	0.005	0.01	0.008	1577
% who answered more than 8 comprehensions correctly (all students)	0.029	-0.028	0.03	0.006	1731

TABLE 10: DIFFERENCE IN LITERACY OUTCOMES BETWEEN INTERVENTION AND COMPARISON GROUPS FOR GRADE III

LITERACY OUTCOME	CONSTANT	COEFFICIENT	S.ERR	P-VALUE	N
Emergent Literacy skills					
% similar beginning words correct	29.16667	14.75702	1.40981	0.000	768
% ending rhyme in words correct	0.039	14.35866	1.45361	0.000	768

% listening comprehension answered correctly by non-readers	-0.055	-0.05	0.05	0.000	154
Decoding					
% letter correct	50	17.2314	1.35163	0.000	768
% frequent/most used words correct	38.48485	17.8653	1.292	0.000	768
Confirmation and fluency					
% of students who are self-reliant reader	48.41965	21.91805	2.10861	0.000	768
Accuracy score with missing for non-readers	0.013	0.007	0.01	0.00	1577
Fluency	6.388	1.006	2.53	0.000	1577
% of comprehension questions, correctly by readers	0.006	0.005	0.01	0.008	1577
% who answered more than 8 comprehensions correctly (all students)	0.029	-0.028	0.03	0.006	1731

The difference between treatment vs. control mean was measured through standard deviation (SD) (see Annex I, Table- 31, 32). The effect size was calculated for all the key reading components of the READ project. Six models of effect size for two groups were followed (e.g. 0.01= very small, 0.20= small, 0.50= medium, 0.80= large, 1.20= very large and 2.0= huge effect). The largest effect size with statistical significance (p value<0.05) for Grade II students was found for phonemic awareness (similar beginning sound- 1.32 and similar ending sound- 1.44) at the endline; all other tasks except fluency showed large effect size (i.e. 0.80) as well. Fluency showed medium effect size. Similarly, Grade III students of treatment group showed very large effect size with statistical significance (p value<0.05) in the endline for all literacy skills, except reading status (reader vs. non-reader), in which medium effect size was found.

CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS

This chapter provides a brief discussion of the findings delineated in the previous chapters on the characteristics of the students and the impact of READ on the literacy skills of students in the study sample. It also presents recommendations for future programming and policy dialogue.

CONCLUSION

The endline study found that the READ program played an important role in improving reading outcomes for grade II and grade III students. More students became independent readers in the READ schools. The study also found significant improvement in reading fluency and comprehension among READ school students, compared to comparison group; these achievements significantly improved from baseline as well. However, the endline study indicates that there is a need to further improve students' fluency, which is below the level suggested by global research, even after significant improvement. This presents an opportunity to make specific recommendations to further investigate and address the scopes of improvement in increasing reading fluency among primary level students.

In addition to reading achievement, the endline study found that the READ intervention changed the study habits of the students in the READ schools. Students in READ schools had better reading habits: they were more likely to borrow a book from the library, studied longer and were more likely to read with their peers, compared to the students in comparison schools. Students in READ schools also used decoding as a strategy to improve reading comprehension and become self-reliant readers. The endline study also found that a weaker home literacy environment led to lower scores on certain reading skills. Therefore, more focus should be given to home literacy environment in future literacy interventions.

RECOMMENDATIONS

- Innovate programming that gives parents and other family members the tools needed to engage in greater depth with their child's education. Both baseline and endline studies showed that more than 90% of family members aid their children in reading and studying. Given this high level of family member interest, it might be worthwhile to explore interventions that provide tips and activities for families on how to help children read better. A recent study in the United States has shown that motivating parents through text messages that give reading tips, goals, activities and games to use with their children has led to an increase in joint reading time which can improve a child's academic performance²⁹.
- Promote independent and voluntary reading practices. READ has encouraged students to borrow books, but the endline results show that students are not engaging with the borrowed books to the fullest extent possible. Encouraging teachers to promote independent and voluntary practices may help students engage with texts outside of the classroom. Involving librarians in the book-borrowing process by hosting story hour to model good reading practices and highlighting grade-level appropriate books available for students to borrow may also facilitate reading for pleasure practices. Considering summer

²⁹ Mayer, Susan E., Ariel Kalil, Philip Oreopoulos, and Sebastian Gallegos. Using behavioral insights to increase parental engagement: The parents and children together (PACT) intervention. No. w21602. National Bureau of Economic Research, 2015.

or after-school reading programs that support independent reading and reading for pleasure is another option to explore.

- Conduct policy dialogues to discuss how to include fluency and comprehension benchmarks in national assessments. As fluency can be language-specific, holding policy dialogues and bench-marking workshops that include a range of policy and education stakeholders would be best to determine the benchmarks that would suit the Bangladeshi context and identify what types of educational materials for both students and teachers might support this initiative. Emphasizing the importance of fluency and comprehension at the policy level will reinforce efforts aimed at improving these reading skills at the school and classroom levels.

LIMITATIONS AND CHALLENGES

One limitation of the study was the timing of the intervention for grade II students, in particular. Because the intervention lasted only 15 months for this group, this may not have been enough time to have a meaningful impact on improving reading fluency for this group of students. In addition, due to technical issues, the timing of baseline and endline varied; baseline was conducted in June-July, 2015 and endline in March-April, 2018. However, to address this issue, we have considered the time period for which students received the intervention, rather than school year.

Another limitation was that Grade III students were not assessed for phonemic awareness (similar beginning sounds and rhyming sounds) and letter knowledge in baseline, with the assumption that as they completed grade I and II, 100% of grade III students would have had adequate knowledge on letters and phonemes. However, later, based on the field experience, it was realized that the situation might be different and in the endline grade III students were assessed on these components. Therefore, baseline data on these three tasks is missing for grade III.

During the study some challenges were faced and these issues were resolved in the best possible ways. The Sylhet area presented several difficulties in the process of data collection. The remoteness of the schools in this area affected the ease and timing of data collection. In addition, the local dialect of the Sylhet area created the challenge of a language barrier, so there was a concerted effort to recruit enumerators from that region to remediate this issue. Support of teachers and school staffs was utilized as well to help resolve any communication issues.

Another challenge was that KoBoToolbox was being used for the first time in the collection of reading data. However, enumerators participated in a 5-day training on the use of the software and the tablets. They also had access to an Information and Communication Technology (ICT) specialist in the field in the event of any questions, concerns or problems.

ANNEX – A: Supplemental Tables and Figures

TABLE 11: READING SKILLS FOR GRADE II & III AT BASELINE AND ENDLINE

Reading Skills	GRADE II					GRADE III				
	Baseline		Endline		p-value	Baseline		Endline		p-value
	Int.	Control	Int.	Control		Int.	Control	Int.	Control	
Letter knowledge (%)	76%	72%	93%	72%	<0.002	-	-	95%	81%	<0.02
Frequent words (%)	55%	60%	94%	64%	<0.001	75%	70%	96%	76%	<0.002
Similar Beginning Words (%)	50%	50%	91%	59%	<0.001	-	-	93%	68%	<0.02
Similar Ending Words (%)	40%	50%	91%	56%	<0.01	-	-	95%	64%	<0.01
Readers	45%	50%	92%	56%	<0.001	74%	76%	99%	81%	<0.002
Fluency (Words per minute) (All students)	26	29	49	31	<0.001	29	29	65	33	<0.001
Reading Comprehension (all students) (%)	7%	7%	68%	37%	<0.001	6%	5%	75%	37%	<0.001

TABLE 12: SAMPLING DISTRIBUTION OF ENDLINE PER REGION FOR GRADE II

SCHOOL TYPE	JHALOKHATHI	COX'S BAZAR	MANIKGANJ	JHENAI DAH	NILPHAMARI	SUNAMGANJ	TOTAL
Intervention	62	33	67	75	77	66	380
Comparison	75	22	77	90	55	66	385
Total	137	55	144	165	132	132	765

TABLE 13: SAMPLING DISTRIBUTION OF ENDLINE PER REGION FOR GRADE III

SCHOOL TYPE	JHALOKHATHI	COX'S BAZAR	MANIKGANJ	JHENAI DAH	NILPHAMARI	SUNAMGANJ	TOTAL
Intervention	64	33	66	77	77	66	383
Comparison	77	22	77	88	55	66	385
Total	141	55	143	165	132	132	768

TABLE 14: LETTER KNOWLEDGE AT ENDLINE PER REGION FOR GRADE II

SCHOOL TYPE	JHALOKHATHI	COX'S BAZAR	MANIKGANJ	JHENAI DAH	NILPHAMARI	SUNAMGANJ	TOTAL
Intervention	92	93	90	94	97	89	93
Comparison	72	75	74	87	56	64	72

TABLE 15: LETTER KNOWLEDGE AT ENDLINE PER REGION FOR GRADE III

SCHOOL TYPE	JHALOKHATHI	COX'S BAZAR	MANIKGANJ	JHENAI DAH	NILPHAMARI	SUNAMGANJ	TOTAL
Intervention	95	94	93	96	97	91	95
Comparison	84	80	82	91	67	75	81

TABLE 16: PERCENTAGE MOST USED WORDS AT ENDLINE PER REGION FOR GRADE II

SCHOOL TYPE	JHALOKHATHI	COX'S BAZAR	MANIKGANJ	JHENAI DAH	NILPHAMARI	SUNAMGANJ	TOTAL
Intervention	96	94	89	97	97	91	94
Comparison	76	70	63	81	36	48	64

TABLE 17: PERCENTAGE MOST USED WORDS AT ENDLINE PER REGION FOR GRADE III

SCHOOL TYPE	JHALOKHATHI	COX'S BAZAR	MANIKGANJ	JHENAI DAH	NILPHAMARI	SUNAMGANJ	TOTAL
Intervention	97	96	91	98	97	95	96
Comparison	90	80	73	90	51	66	76

TABLE 18: PERCENTAGE OF SIMILAR BEGINNING SOUNDS AT ENDLINE PER REGION FOR GRADE II

SCHOOL TYPE	JHALOKHATHI	COX'S BAZAR	MANIKGANJ	JHENAI DAH	NILPHAMARI	SUNAMGANJ	TOTAL
Intervention	91	95	89	95	90	90	91
Comparison	56	75	62	72	37	53	59

TABLE 19: PERCENTAGE OF SIMILAR BEGINNING SOUNDS AT ENDLINE PER REGION FOR GRADE III

SCHOOL TYPE	JHALOKHATHI	COX'S BAZAR	MANIKGANJ	JHENAI DAH	NILPHAMARI	SUNAMGANJ	TOTAL
Intervention	94	93	89	96	93	95	93
Comparison	64	79	71	77	47	68	68

TABLE 20: PERCENTAGE OF SIMILAR ENDING SOUNDS AT ENDLINE PER REGION FOR GRADE II

SCHOOL TYPE	JHALOKHATHI	COX'S BAZAR	MANIKGANJ	JHENAI DAH	NILPHAMARI	SUNAMGANJ	TOTAL
Intervention	91	95	89	95	90	90	91
Comparison	56	75	62	72	37	53	59

TABLE 21: PERCENTAGE OF SIMILAR ENDING SOUNDS AT ENDLINE PER REGION FOR GRADE III

SCHOOL TYPE	JHALOKHATHI	COX'S BAZAR	MANIKGANJ	JHENAI DAH	NILPHAMARI	SUNAMGANJ	TOTAL
Intervention	94	98	94	98	95	94	95
Comparison	54	81	69	79	41	66	64

TABLE 22: FLUENCY (WPMC) AT ENDLINE PER REGION FOR GRADE II

SCHOOL TYPE	JHALOKHATHI	COX'S BAZAR	MANIKGANJ	JHENAI DAH	NILPHAMARI	SUNAMGANJ	TOTAL
Intervention	41	49	24	50	76	49	49
Comparison	36	35	26	40	25	22	31

TABLE 23: FLUENCY (WPMC) AT ENDLINE PER REGION FOR GRADE III

SCHOOL TYPE	JHALOKHATHI	COX'S BAZAR	MANIKGANJ	JHENAI DAH	NILPHAMARI	SUNAMGANJ	TOTAL
Intervention	60	63	43	81	89	45	65
Comparison	40	37	26	36	25	34	33

TABLE 24: STUDENT WITH COMPREHENSION AT ENDLINE PER REGION FOR GRADE II (80% OR MORE THAN 80% QUESTIONS ANSWERED CORRECTLY— ALL SAMPLE)

SCHOOL TYPE	JHALOKHATHI	COX'S BAZAR	MANIKGANJ	JHENAI DAH	NILPHAMARI	SUNAMGANJ	TOTAL
Intervention	65%	64%	63%	81%	78%	55%	68%
Comparison	39%	37%	44%	60%	18%	21%	37%

TABLE 25: STUDENT WITH COMPREHENSION AT ENDLINE PER REGION FOR GRADE III (80% OR MORE THAN 80% QUESTIONS ANSWERED CORRECTLY— ALL SAMPLE)

SCHOOL TYPE	JHALOKHATHI	COX'S BAZAR	MANIKGANJ	JHENAI DAH	NILPHAMARI	SUNAMGANJ	TOTAL
Intervention	83%	63%	62%	87%	81%	67%	75%
Comparison	49%	32%	39%	56%	19%	20%	37%

TABLE 26: LIST OF GPS ENDLINE SURVEY DISTRICTS AND DIVISION

SL#	DISTRICT	DIVISION
1	Jhalokathi	Barishal
2	Cox's Bazar	Chattogram
3	Manikganj	Dhaka
4	Jhenaidah	Khulna
5	Nilphamari	Rangpur
6	Sunamganj	Sylhet

FIGURE 14: CORRELATION BETWEEN FLUENCY AND COMPREHENSION (ENDLINE)- GRADE II

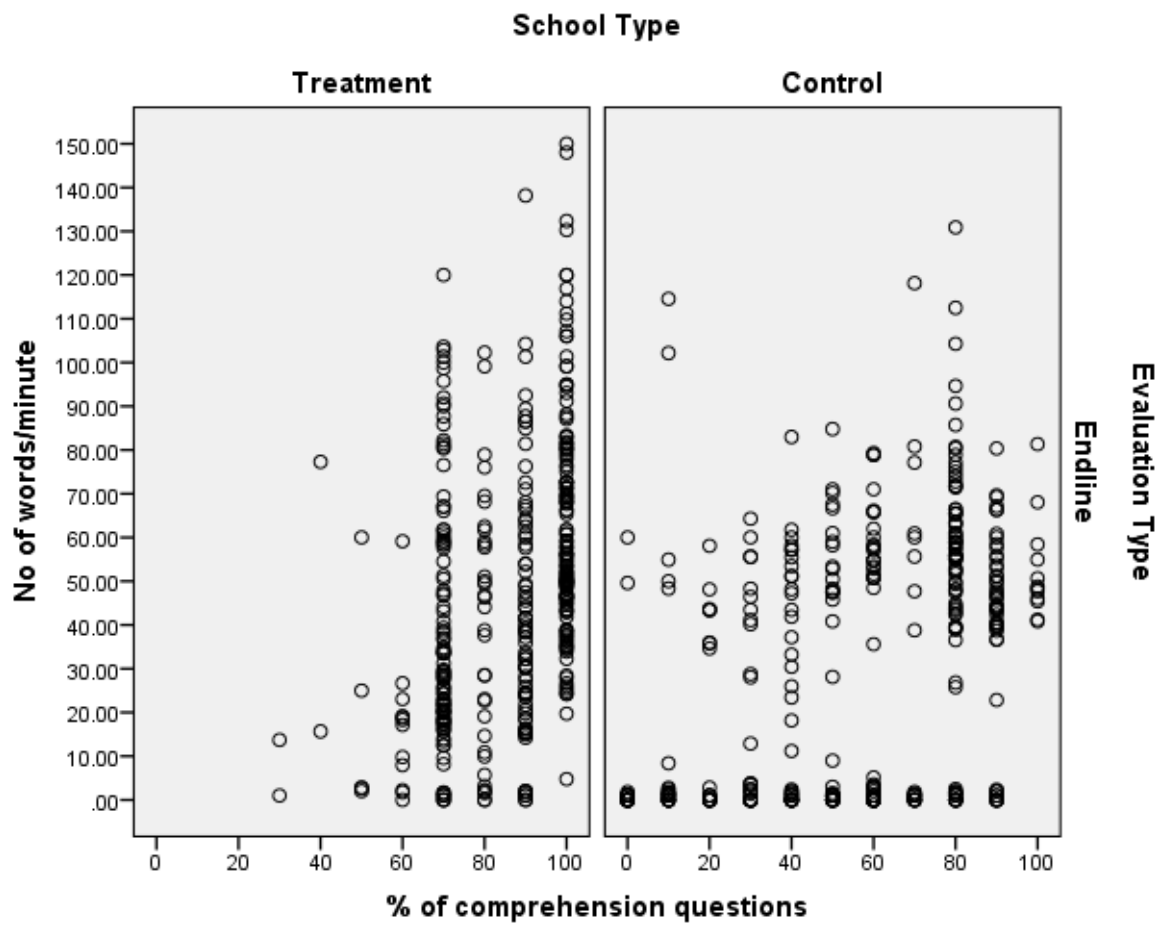


FIGURE 15: CORRELATION BETWEEN FLUENCY AND COMPREHENSION (ENDLINE)- GRADE III

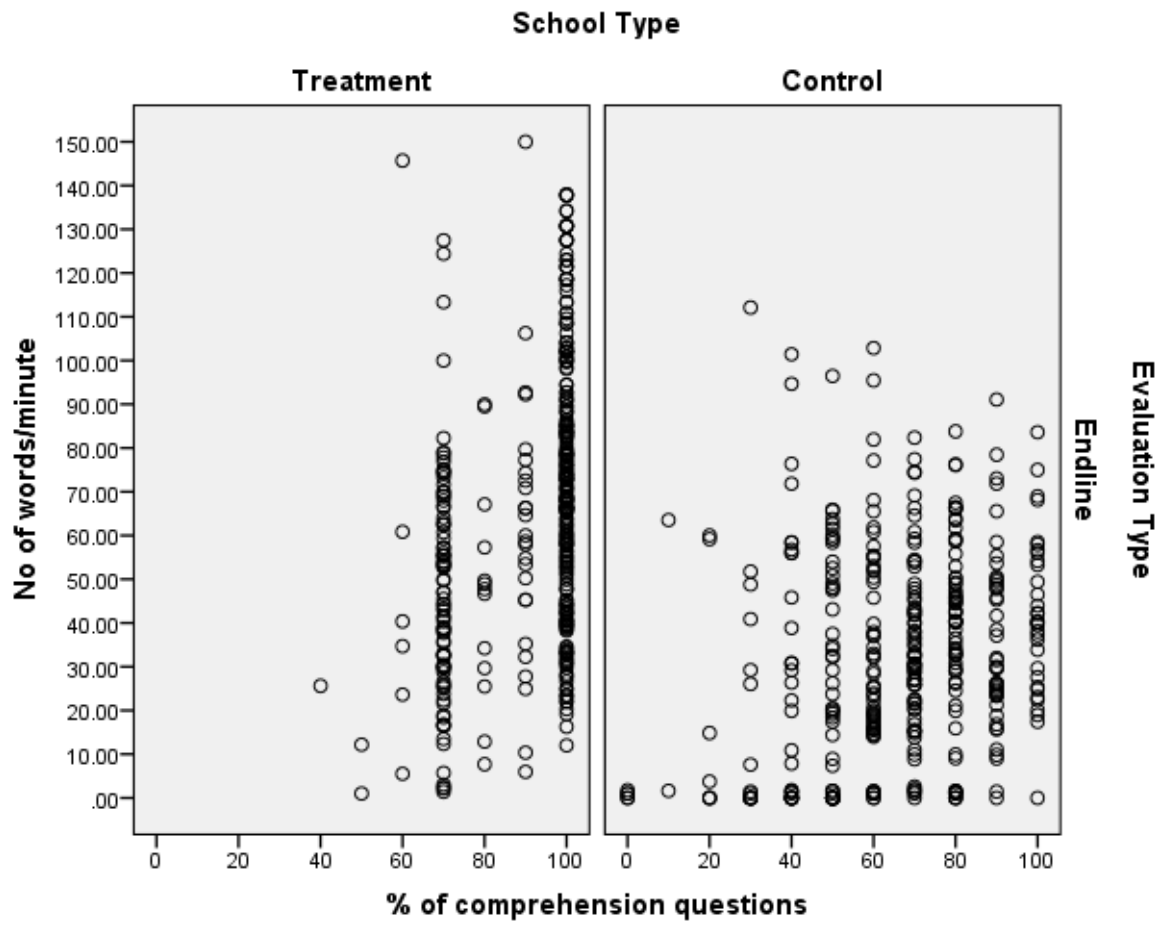


TABLE 27: COMPREHENSION QUESTIONS ANSWERED BY READERS VS. NON READERS AMONG GRADE II STUDENTS

Reader vs.		Baseline	Endline
------------	--	----------	---------

Non-Reader	No. of correctly answered questions	Treatment		Control		Treatment		Control	
		N	%	N	%	N	%	N	%
Non-Reader	<=4	194	100.0%	120	98.4%	1	3.4%	86	50.6%
	5-7	0	0.0%	0	0.0%	14	48.3%	59	34.7%
	=>8	0	0.0%	2	1.6%	14	48.3%	25	14.7%
Reader	<=4	56	36.1%	66	55.0%	3	0.9%	49	22.8%
	5-7	76	49.0%	38	31.7%	105	29.9%	50	23.3%
	=>8	23	14.8%	16	13.3%	243	69.2%	116	54.0%

TABLE 28: COMPREHENSION QUESTIONS ANSWERED BY READERS VS. NON READERS AMONG GRADE III STUDENTS

Reader vs. Non-Reader	No. of correctly answered questions	Baseline				Endline			
		Treatment		Control		Treatment		Control	
		N	%	N	%	N	%	N	%
Non-Reader	<=4	94	100.0%	58	95.1%	0	0.0%	30	41.1%
	5-7	0	0.0%	1	1.6%	5	100.0%	31	42.5%
	=>8	0	0.0%	2	3.3%	0	0.0%	12	16.4%
Reader	<=4	150	57.5%	129	72.1%	1	0.3%	30	9.6%
	5-7	91	34.9%	39	21.8%	91	24.1%	152	48.7%
	=>8	20	7.7%	11	6.1%	286	75.7%	130	41.7%

TABLE 29: PERCENTAGE OF NON-READER AMONG GRADE II STUDENTS IN BASELINE AND ENDLINE BY DISTRICT

School Type	Jhalokathi	Cox's Bazar	Manikgonj	Jhinaidah	Nilphamari	Sunamganj
-------------	------------	-------------	-----------	-----------	------------	-----------

	B (%)	E (%)	B (%)	E (%)	B (%)	E (%)	B (%)	E (%)	B (%)	E (%)	B (%)	E (%)
Intervention	31%	5%	60%	3%	49%	25%	43%	0%	72%	1%	77%	11%
Control	47%	32%	24%	36%	60%	53%	19%	28%	60%	60%	68%	59%

*B=Baseline; E=Endline

TABLE 30: CHANGE IN PERCENTAGE OF NON-READER AMONG GRADE III STUDENTS FROM BASELINE TO ENDLINE BY DISTRICT

School Type	Jhalokathi		Cox's Bazar		Manikgonj		Jhinaidah		Nilphamari		Sunamganj	
	B (%)	E (%)	B (%)	E (%)	B (%)	E (%)	B (%)	E (%)	B (%)	E (%)	B (%)	E (%)
Intervention	16%	0%	29%	0%	21%	3%	23%	0%	23%	0%	45%	5%
Control	17%	9%	24%	18%	23%	25%	7%	5%	38%	44%	30%	23%

*B=Baseline; E=Endline

TABLE 31: EFFECT SIZE OF KEY READING SKILLS AMONG TREATMENT VS CONTROL GROUP STUDENTS OF GRADE II

READING COMPONENTS	STUDY GROUP						RAW DIFFERENCE						STANDARDISED EFFECT SIZE					
	Treatment group			Control group			pooled standard deviation	p-value for difference in SDs	Mean Difference	p-value for mean diff (2-tailed T-test)	Confidence Interval for Difference		Effect Size	Bias corrected (Hedges)	Standard Error of E.S. estimate	Confidence Interval for Effect Size		Effect Size based on control gp SD
	mean	n	SD	mean	n	SD					lower	upper				lower	upper	
Letter Knowledge-BL	75.08	349	30.60	72.55	242	32.14	31.24	0.20	2.53	0.33	-2.60	7.66	0.08	0.08	0.08	-0.08	0.24	0.08
Letter Knowledge-EL	92.79	380	10.58	72.45	385	27.47	20.86	0.00	20.34	0.00	17.38	23.30	0.97	0.97	0.08	0.82	1.12	0.74
Most used words-BL	56.88	349	39.37	58.51	242	39.44	39.40	0.48	-1.63		-8.10	4.84	-0.04	-	0.08	-0.21	0.12	-0.04
Most used words -EL	94.33	380	13.34	63.69	385	39.38	29.48	0.00	30.64	0.00	26.46	34.82	1.04	1.04	0.08	0.89	1.19	0.78
Similar beginning sound-BL	46.56	349	28.53	54.5	242	32.97	30.43	0.01	-7.94		-12.94	-2.94	-0.26	-	0.08	-0.43	-0.10	-0.24
Similar beginning sound-EL	91.24	380	13.49	58.78	385	32.04	24.63	0.00	32.46	0.00	28.96	35.96	1.32	1.32	0.08	1.16	1.47	1.01
Similar ending sound-BL	38.11	349	27.18	48.06	242	31.97	29.24	0.00	-9.95		-14.75	-5.15	-0.34	-	0.08	-0.50	-0.17	-0.31
Similar ending sound-EL	91.13	380	14.75	56.16	385	30.98	24.31	0.00	34.97	0.00	31.52	38.42	1.44	1.44	0.08	1.28	1.60	1.13
Fluency-wpmc -BL	13.42	349	17.59	15.3	242	19.35	18.33	0.05	-1.89		-4.90	1.13	-0.10	-	0.08	-0.27	0.06	-0.10
Fluency-wpmc-EL	48.85	380	34.86	31.02	385	29.93	32.48	0.00	17.83	0.00	13.22	22.44	0.55	0.55	0.07	0.40	0.69	0.60
% who answered >= 8 comprehensions qst (all students-BL)	23.04	349	29.52	23.22	242	30.4	29.88	0.31	-0.18		-5.09	4.73	-0.01	-	0.08	-0.17	0.16	-0.01
% who answered >= 8 comprehensions qst (all students-EL)	85.47	380	14.69	55.58	385	28.59	22.77	0.00	29.89	0.00	26.66	33.12	1.31	1.31	0.08	1.15	1.47	1.05
% of students who are self-reliant reader-BL	0.44	349	0.498	0.5	242	0.501	0.50	0.46	-0.06		-0.14	0.02	-0.12	-	0.08	-0.28	0.04	-0.12
% of students who are self-reliant reader-EL	0.92	380	0.266	0.56	385	0.497	0.40	0.00	0.36	0.00	0.30	0.42	0.90	0.90	0.08	0.75	1.05	0.72

TABLE 32: EFFECT SIZE OF KEY READING SKILLS AMONG TREATMENT VS CONTROL GROUP STUDENTS OF GRADE III

Reading components	Study Group						RAW DIFFERENCE						STANDARDISED EFFECT SIZE					
	Treatment group			Control group			pooled standard deviation	p-value for difference in SDs	Mean Difference	p-value for mean diff (2-tailed T-test)	Confidence Interval for Difference		Effect Size	Bias corrected (Hedges)	Standard Error of E.S. estimate	Confidence Interval for Effect Size		Effect Size based on control group SD
	mean	n	SD	mean	n	SD					lower	upper				lower	upper	
Letter Knowledge-BL																		
Letter Knowledge-EL	94.52	383	6.40	80.82	385	21.15	15.64	0.00	13.70	0.00	11.48	15.92	0.88	0.87	0.08	0.73	1.02	0.65
Most used words-BL	27.77	355	31.41	76.92	240	32.98	32.05	0.20	-49.15		-54.41	-43.89	-1.53	-1.53	0.09	-1.72	-1.35	-1.49
Most used words -EL	95.77	383	7.86	76.27	385	32.46	23.64	0.00	19.50	0.00	16.15	22.85	0.82	0.82	0.08	0.68	0.97	0.60
Similar beginning sound-BL																		
Similar beginning sound-EL	93.42	383	10.59	67.51	385	27.29	20.72	0.00	25.91	0.00	22.97	28.85	1.25	1.25	0.08	1.09	1.40	0.95
Similar ending sound-BL																		
Similar ending sound-EL	95.25	383	10.07	64.39	385	30.48	22.72	0.00	30.86	0.00	27.64	34.08	1.36	1.36	0.08	1.20	1.51	1.01
Fluency-wpmc -BL	29.09	355	24.11	28.99	240	24.46	24.25	0.40	0.11	0.96	-3.88	4.09	0.00	0.00	0.08	-0.16	0.17	0.00
Fluency-wpmc-EL	64.52	383	31.06	32.94	385	23.86	27.69	0.00	31.58	0.00	27.66	35.50	1.14	1.14	0.08	0.99	1.29	1.32
% who answered >= 8 comprehensions qst (all students-BL)	31.1	355	26.53	22.79	240	27.39	26.87	0.29	8.31	0.00	3.90	12.72	0.31	0.31	0.08	0.14	0.47	0.30
% who answered >= 8 comprehensions qst (all students-EL)	90.7	383	13.74	66.18	385	21.45	18.02	0.00	24.52	0.00	21.97	27.07	1.36	1.36	0.08	1.20	1.52	1.14
% of students who are self-reliant reader-BL	0.74	355	0.442	0.75	240	0.436	0.44	0.41	-0.01	#NUM!	-0.08	0.06	-0.02	-0.02	0.08	-0.19	0.14	-0.02
% of students who are self-reliant reader-EL	0.99	383	0.114	0.81	385	0.393	0.29	0.00	0.18	0.00	0.14	0.22	0.62	0.62	0.07	0.48	0.77	0.46

USAID's Reading Enhancement for Advancing Development (READ) Activity
Save the Children
House # CWN (A) 35, Road # 43, Gulshan # 2, Dhaka-1212, Bangladesh
T: +88-09612555333

Endline Evaluation of Government Primary Schools (GPS)
USAID Cooperative Agreement # AID 388-A13-00006
September 4, 2018

www.readbangladesh.org

