EQuALLS2 PROJECT EDUCATION QUALITY AND ACCESS FOR LEARNING AND LIVELIHOOD SKILLS PROJECT

Autonomous Region in Muslim Mindanao | Region IX | Region XII

WHOLE SCHOOL READING PROGRAM EVALUATION FINDINGS

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EXECUTIVE SUMMARY

The Whole School Reading Program (WSRP) is a school-based program implemented by Education Development Center's (EDC) Education Quality and Access for Learning and Livelihoods Skills (EQuALLS2) program, a USAID-funded project in western Mindanao, Philippines. The WSRP was implemented for one school year in 53 schools in Mindanao—28 in Region 12, 14 in Region 9, and 11 in the Autonomous Region in Muslim Mindanao (ARMM)—reaching a total of 972 teachers and 38,566 students in grades 1 to 6.

WSRP's purpose is to improve students' reading skills by strengthening teachers' skills in teaching the five components of reading: phonological awareness, phonics, fluency, vocabulary, and comprehension. The basic program design involves school administrators and all English, science, and math teachers at all grade levels (1–6) in a series of activities focused on building reading, writing, listening, and speaking skills in English classes, while reinforcing these skills in math and science classes. As the name suggests, the project creates awareness about the importance of reading and writing skills throughout the school and encourages teachers in all grades to be cognizant of their role in supporting the acquisition of these skills. The WSRP model includes the following key components:

- Professional development courses for teachers and school administrators on teaching reading and writing, as well as on using assessment results to inform instruction, emphasizing
    - Explicit instruction in phonics, phonemic awareness, word recognition, vocabulary development, fluency, and comprehension
    - Technical guidance and mentoring support at the school level by school administrators and district supervisors
- Development of locally produced instructional materials
- Involvement of local stakeholders such as parents and community members in supporting school literacy initiatives

Anchoring the WSRP approach is the preparation of a School Reading Improvement Plan that sets goals for students reading below grade level, outlines activities for students reading at or above grade level, and identifies opportunities for teachers to improve their reading and writing instruction skills (Box 1).

Box 1 The Whole School Reading Program Model

Evaluation Overview

EDC implemented and evaluated the WSRP from June 2012 to March 2013 (one academic year in the Philippines). The purpose of the evaluation study was to determine the effects of this one-year implementation of WSRP on teaching quality and student achievement in grades 2 and 3.[1] The WSRP evaluation was designed to test whether the program was successful in effecting a positive change in student performance, teacher practices vis-à-vis reading, and teacher beliefs about literacy instruction. The evaluation addressed three global questions related to student performance, teacher performance, and teacher attitudes.

1. Was there a significant improvement in the reading skills of students in grades 2 and 3 as a result of the intervention?
2. Did teacher instructional practice change as a result of the intervention?
3. Did teacher attitudes and beliefs about literacy instruction change as a result of the intervention?

The evaluation also looked at two questions regarding the relationships between teacher performance, teacher beliefs, and student performance.

4. Were the changes in teachers' beliefs associated with changes in their instructional practices in teaching reading in English?
5. Were the changes in teachers' instructional practices associated with changes in students' reading skills?

The evaluation employed a longitudinal quasi-experimental design that followed the progress of 54 teachers and their students in WSRP (intervention) schools and 39 teachers in non-WSRP (comparison) schools across seven divisions of Regions 9, 12, and the ARMM. Two tools were administered to teachers at both the intervention and comparison schools: a Teacher Belief and Practice Index (BIPI) to track self-reported changes in beliefs about teaching practice, and a modified and shortened version of the Standards-based Classroom Observation Protocol for Educators (SCOPE) in Literacy, designed to focus on literacy only. An electronic version of the Early Grade Reading Assessment (EGRA) was administered to both the intervention and comparison groups of students, comprising in all 391 second graders and 428 third graders. The SCOPE Literacy and EGRA were administered by DepEd Division supervisors who received training prior to each data collection.

Comparison schools were selected from schools in the three regions that had similar scores to the intervention schools on the National Achievement Test and the Philippines Informal Reading Inventory (Phil IRI). In general, students and teachers in the intervention group scored higher on the pretests than

[1] In the 2012–2013 school year, the Philippines Department of Education implemented a K–12 curriculum, in which the mother tongue was used as the language of instruction in the first two grading periods of grade 1. Since WSRP focuses on reading in English, data were collected from grades 2 and 3 only.

those in the randomly selected comparison group. Hence, for students we compared gain scores between the pre- and post-EGRA tests, while for teachers we compared gain scores between the pre- and post-administrations of the SCOPE tool and the BIPI survey.

Statistical analyses of the three datasets generally showed positive patterns of change between the pretests and posttests associated with WSRP's interventions, although there is variability across regions. Below, we report the findings of the three tools (EGRA, SCOPE Literacy, and BIPI) and their association with the project interventions; we then discuss associations among the results of the three assessments.

Student Performance Results

EGRA is an orally administered set of subtasks designed to assess the basic literacy skills that are critical to becoming a good reader. The test administrator uses paper prompts to administer the subtests and a laptop computer to score the subtests as they are being administered. Box 2 lists the three EGRA subtests and the specific items they examine.

Box 2 EGRA Subtests

- **Pre-literacy skills**
  - **Orientation to print**
  - **Letter naming**
  - **Letter sounds**
  - **Initial sound identification**
- **Fluency skills**
  - **Familiar word reading**
  - **Invented word reading**
  - **Oral passage reading**
- **Comprehension and writing skills**
  - **Oral reading comprehension**
  - **Listening comprehension**
  - **Dictation**

Overall, for most subtests intervention group students showed a much larger gain from pretest to posttest than did their peers in the comparison group. Statistically, second-grade intervention group students gained significantly more from pretest to posttest in seven out of 10 subtests, whereas students from the comparison group gained more in just one subtest. Third-grade intervention group students gained significantly more in three subtests, and students from the comparison group gained significantly more in two other subtests.

Table 1 shows summary results for pre-literacy subtests. Compared to the gains made by students in the comparison group, intervention group second graders gained significantly more from pretest to posttest in orientation to print and letter-naming subtests Third-grade intervention group students gained more in letter-naming and letter sounds subtests. Comparison students in both grades gained more in the initial sound identification subtest.

Table 1. Summary Results for Pre-literacy Subtests

		GRADE 2 STUDENTS		
		Pretest Mean (St. Error)	Posttest Mean (St. Error)	Gain Score (St. Error)
Orientation to print (% correct; 3 questions)	Intervention	82.6% (1.07)	93% (0.696)	10.4%* (1.303)
	Comparison	75.2% (1.285)	81.5% (1.207)	6.3% (1.533)
Letters named (per minute)	Intervention	48.8‡ (0.854)	66.9 (0.944)	18.2*** (0.813)
	Comparison	39.7 (0.872)	52.8 (1.007)	13.1 (0.694)
Letter sounds (per minute)	Intervention	34.3‡ (1.004)	42.2 (0.626)	7.7 (1.002)

	Comparison	25.5 (1.381)	30.7 (0.753)	5.2 (1.306)
Initial sound identification (% correct; 10 words)	Intervention	72.6%‡ (1.055)	87.4% (0.742)	14.9% (0.91)
	Comparison	48.5% (1.424)	66.8% (1.35)	18.4%* (1.152)

GRADE 3 STUDENTS

		Pretest Mean (St. Error)	Posttest Mean (St. Error)	Gain Score (St. Error)
Orientation to print (% correct; 3 questions)	Intervention	84.1% (0.848)	92.2% (0.616)	8.1% (1.005)
	Comparison	83.1% (1.172)	88.2% (0.92)	5.1% (1.44)
Letters named (per minute)	Intervention	61.7 (0.719)	78.1 (0.694)	16.2 (0.574)**
	Comparison	55.2 (0.974)	68.6 (1.04)	13.3 (0.823)
Letter sounds (per minute)	Intervention	30.1 (0.522)	41.2 (0.522)	11 (0.573)*
	Comparison	30.5 (1.494)	37.9 (0.692)	7.4 (1.515)
Initial sound identification (% correct; 10 words)	Intervention	73.9%‡ (0.894)	87.6% (0.645)	13.8% (0.768)
	Comparison	58.4% (1.419)	76.4% (1.134)	18% (1.11)**

‡ The group's pretest mean score is statistically higher compared with the other group's score, at p<.01 level.
*The group's gain score is statistically significantly higher than the other group's at p <.05 level.
**The group's gain score is statistically significantly higher than the other group's at p <.01 level.
***The group's gain score is statistically significantly higher than the other group's at p <.001 level.

Table 2 shows a summary of students' learning gains in the EGRA fluency subtests. Although students in both groups gained substantially from pretest to posttest, second-grade students in the intervention group demonstrated statistically significantly larger gains in the speeds at which they read familiar words and an oral passage. Third-grade intervention students showed larger gains in the subtest on reading invented words.

Table 2. Summary Results for Fluency Subtests

GRADE 2 STUDENTS

		Pretest Mean (St. Error)	**Posttest Mean (St. Error)**	**Gain Score (St. Error)**
Familiar word reading (words per minute)	Intervention	29.5‡ (0.76)	40.4 (0.69)	10.8** (0.59)
	Comparison	20.3 (0.83)	28.7 (0.74)	8.4 (0.67)
Invented word reading (words per minute)	Intervention	26.5‡ (0.64)	36.5 (0.59)	10 (0.44)
	Comparison	20.5 (0.85)	28.9 (0.76)	8.5 (0.82)
Oral passage reading (words per minute)	Intervention	34.1‡ (0.94)	48.1 (0.91)	14.0** (0.71)
	Comparison	22.9 (0.96)	33.7 (0.96)	10.8 (0.69)

GRADE 3 STUDENTS

		Pretest Mean (St. Error)	**Posttest Mean (St. Error)**	**Gain Score (St. Error)**
Familiar word reading (words per minute)	Intervention	42.8 (0.80)	50.8 (0.70)	8.0 (0.78)
	Comparison	35.5 (0.92)	43.9 (0.96)	8.4 (0.65)
Invented word reading (words per minute)	Intervention	37 (0.59)	45.9 (0.58)	8.8* (0.48)

	Comparison	32.1 (0.83)	39.4 (0.79)	7.3 (0.53)
Oral passage reading (words per minute)	Intervention	57.8 (1.07)	63.9 (0.91)	6.1 (0.88)
	Comparison	47.5 (1.37)	54.3 (1.24)	6.8 (0.84)

‡ The group's pretest mean score is statistically higher compared with the other group's score, at p<.01 level.
* The gain score is statistically significant at p<.05 level (one-tail test).
** The gain score is statistically significant at p <.01 level (one-tail test).
*** The gain score is statistically significant at p <.001 level (one-tail test).

It is important to note that although the EGRA testing showed relatively high pre-literacy and fluency skills at pretest, particularly among the third graders, students exhibited very low listening and reading comprehension skills in both grades during both rounds of testing (Table 3). A lack of direct correspondence between oral reading fluency and reading comprehension is frequently observed in countries where instruction does not occur in a native language, as is often the case in the Philippines.

Table 3. Summary Results for Comprehension and Writing Subtests

		GRADE 2 STUDENTS		
		Pretest Mean (St. Error)	Posttest Mean (St. Error)	Gain Score (St. Error)
Reading comprehension (% correct; 6 questions)	Intervention	9.5%‡ (0.66)	18.2% (0.88)	8.7%*** (0.69)
	Comparison	3.6% (0.44)	7.8% (0.56)	4.3% (0.48)
Listening comprehension (% correct; 5 questions)	Intervention	9.5%‡ (0.64)	18.9% (0.83)	9.4%*** (0.68)
	Comparison	4% (0.35)	6.7% (0.47)	2.7% (0.47)
Dictation (% correct; 16 points)	Intervention	25.9%‡ (0.809)	47% (1.005)	21.1%*** (0.809)
	Comparison	14.1% (0.641)	29.2% (0.891)	15.1% (0.639)
		GRADE 3 STUDENTS		
		Pretest Mean (St. Error)	Posttest Mean (St. Error)	Gain Score (St. Error)
Reading comprehension (% correct; 6 questions)	Intervention	17.9% (0.78)	25.2% (0.86)	7.3% (0.65)
	Comparison	12.3% (0.85)	24.5% (1.09)	12.1%*** (0.81)
Listening comprehension (% correct; 5 questions)	Intervention	12.4% (0.58)	19% (0.77)	6.7% (0.61)
	Comparison	9.3% (0.63)	15.9% (0.86)	6.5% (0.63)
Dictation (% correct; 16 points)	Intervention	38.3% (0.836)	57.5% (0.801)	19.2% (0.607)
	Comparison	30.1% (1.004)	47.7% (1.103)	17.6% (0.731)

‡ The group's pretest mean score is statistically higher compared with the other group's score, at p<.001 level.
* The gain score is statistically significant at p<.05 level (one-tail test).
**The gain score is statistically significant at p <.01 level (one-tail test).
*** The gain score is statistically significant at p <.001 level (one-tail test).

Second-grade intervention group students gained statistically significantly more than second-grade comparison group students, as evidenced by a comparison of means test for the average gains across all ten EGRA subtests. No statistically significant difference was found between the gains made by the third

graders in the two groups (Table 4). Thus, the intervention appeared to have been particularly effective for the second-grade classrooms. The question of why the third graders did not gain as much as the second graders merits further inquiry.

Table 4. Comparison of Average EGRA Gains by Grade

	GRADE 2 STUDENTS			GRADE 3 STUDENTS		
	Mean Gains (St. Error)	*t*	Sig. (2-tailed)	Mean Gains (St. Error)	*t*	Sig. (2-tailed)
Intervention group	15.38% (.40)	4.856	.000	12.40% (.31)	.521	n/s
Comparison group	12.58% (.42)			12.13% (.42)		

The overall improvement in achievement was more significant for female students than for male students. Intervention group girls made larger gains in more EGRA subtests than the boys did. Second-grade girls also outscored boys on both the pre- and posttest. This pattern also prevails in the data for the third graders, although in this case the difference between boys and girls is not as pronounced in some subscales. These results merit further inquiry.

Finally, a significant difference in student learning gains was found across three regions. Intervention group second graders in the ARMM region demonstrated the largest overall gains over comparison group students, while in the same region third graders in the comparison group gained significantly more than their peers in the intervention group. In Region 9, intervention group third graders gained statistically significantly more than their counterparts in the comparison group. Finally, intervention group second graders in Region 12 showed marginally larger average gains than their peers in the comparison group. Table 5 shows the results of the comparison of means analysis of the average gains across all ten EGRA subtests by region.

Table 5. Comparison of Average EGRA Gains by Grade and Region

ARMM						
	GRADE 2 AVERAGE GAINS			GRADE 3 AVERAGE GAINS		
	Mean Gains (St. Error)	T	Sig. (2-tailed)	Mean Gains (St. Error)	T	Sig. (2-tailed)
Intervention group	21.86% (.87)	7.561	.000	10.06% (.80)		
Comparison group	12.31% (.91)			15.68% (.97)	4.474	.000

Region 9						
	GRADE 2 AVERAGE GAINS			GRADE 3 AVERAGE GAINS		
	Mean Gains (St. Error)	T	Sig. (2-tailed)	Mean Gains (St. Error)	T	Sig. (2-tailed)
Intervention group	12.32% (.63)	1.419	n/s	11.59% (.44)	5.251	.000
Comparison group	10.88% (.82)			07.04% (.85)		

Region 12						
	GRADE 2 AVERAGE GAINS			GRADE 3 AVERAGE GAINS		
	Mean Gains (St. Error)	T	Sig. (2-tailed)	Mean Gains (St. Error)	T	Sig. (2-tailed)
Intervention group	15.07% (.56)	1.984	.048	13.84% (.46)	.844	n/s
Comparison group	13.46% (.58)			13.24% (.53)		

Regression analysis also showed that the intervention was particularly effective in improving overall student achievement among second graders in ARMM (R^2 = .157) and among third graders in Region 9 (R^2 = .049). Regression analysis also found that the intervention had a statistically significant positive impact on achievement among second graders in Region 12, but the amount of impact was very small (R^2 = .005) [2]. Further research is needed to understand why the intervention had different effects across regions.

Instructional Practice Results

Teachers' reading instructional practices in the intervention and comparison sample groups were observed twice by trained classroom observers, using an abbreviated adaptation of SCOPE Literacy, to capture whether or not the training resulted in a measurable change at the classroom practice level. Observations focused on five dimensions of good instructional practice in literacy classrooms. Specifically, trained observers looked for the degree to which the teacher demonstrated the practices described in Box 3. Scores were determined by a five-level rubric containing multiple descriptions of performance for each level, with the lowest score being **1** and the highest **5** (a score of **1** indicates that the teacher **rarely**

Box 3 Five Selected Dimensions of SCOPE Literacy	
Dimension 1	**Provides students with structured opportunities to develop their encoding (spelling/writing) and decoding skills**
Dimension 2	Provides students with structured opportunities to increase their **vocabulary** in order to improve their reading comprehension and writing skills
Dimension 3	Uses diverse instructional strategies to develop **students' reading fluency**
Dimension 4	Uses diverse instructional strategies to develop students' **comprehension skills**
Dimension 5	Implements instruction that recognizes the importance of **independent, original writing** in the development of reading skills

[2] R-squared is a linear regression statistic that helps understand the extent to which participation in the WSRP program explains variation in student performance improvement. Converted to percentage points, R^2 of .157 means that participation in the WSPR program explained 15.7 percent of variance in the overall achievement improvement among ARMM second graders; R^2 of .049 means that participation in the WSPR program explained nearly 5 percent of variance in the overall achievement improvement among District 9 third graders, and the R^2 of .005 means that participation in the WSPR program explains a half of one percent of variance in the overall achievement improvement among District 12 second graders. These results show that the program made a substantial impact on the EGRA performance of ARMM second graders, moderate impact on the EGRA performance of Region 9 third graders, and small impact on the EGRA performance of Region 12 second graders.

demonstrates the practices; **2,** that he/she does so with **limited** application; **3,** does so **occasionally**; **4,** does so **frequently**; and **5,** demonstrates **consistent** application of the practices related to each of the component skills of reading).

SCOPE dimension 1 focuses on providing students with explicit instruction in letter names and sounds, word recognition, and other structured phonemic awareness activities to develop their encoding (spelling/writing) and decoding skills. Based on the SCOPE scoring scale for this dimension (see Box 3), results show that at pretest, a large percentage (42.6 percent) of the intervention group teachers scored 2, while a similar proportion (38.5 percent) of the comparison group teachers scored at the same level (Figure 1). At posttest, half of the intervention group teachers improved their score to 3, while only 28.2 percent of the comparison group teachers did so (Figure 2).

Figure 1. SCOPE Literacy Dimension 1 Pretest

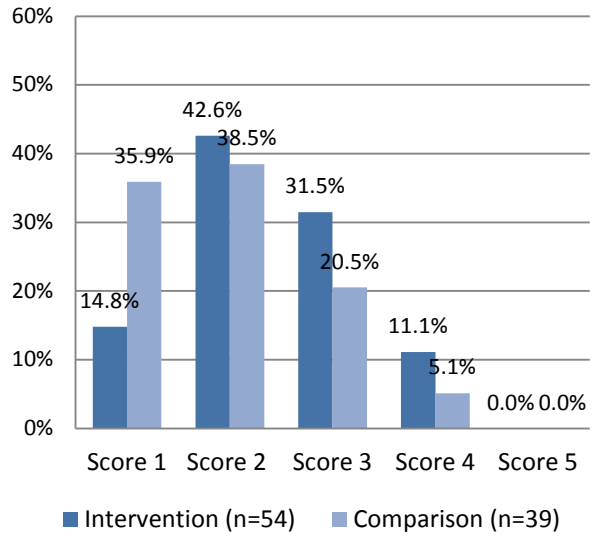
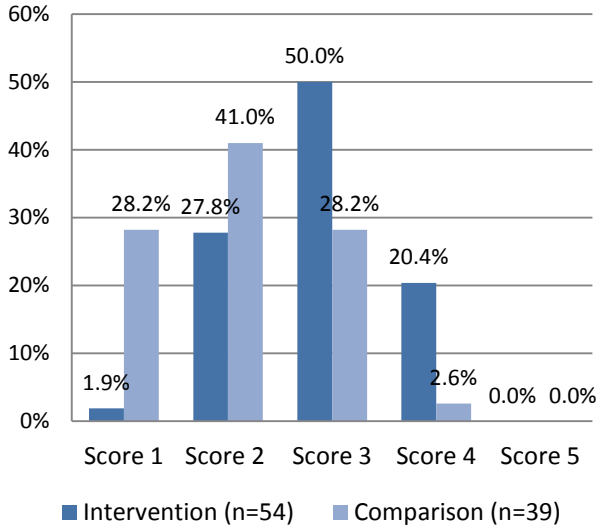


Figure 2. SCOPE Literacy Dimension 1 Posttest



SCOPE dimension 2 focuses on teachers' application of strategies—for example, teaching sight words; using synonyms and antonyms, suffixes and prefixes; and identifying context clues—to introduce new or difficult words to help students increase their vocabulary. The related scoring scale is shown in Box 4.

Results showed that at pretest, about half of the intervention and a similar proportion of the comparison group scored 2 for this dimension (see Figure 3). At posttest, the percentage of teachers who scored 2 increased slightly, to 63 percent for the intervention group and 61.5 percent for the comparison group. However, compared to the non-WSRP teachers, a higher percentage of intervention group teachers improved their scores from 2 to 3—27.8 percent at pretest versus 31.5 percent at posttest (see Figure 4). The comparison of gain score, or pretest-posttest, results showed that the percentage of intervention group respondents with a score of 1 decreased by nearly 17 points (from 18.5 percent to 1.9 percent), with corresponding movement into the upper score categories, particularly for score 2, which increased by 11 percentage points. These positive changes are encouraging and

indicate potential for continued improvement. For the comparison group respondents, the corresponding change in scores 1 and 2 represented a decrease of only 5 percent and an increase of only 7 percent respectively.

Figure 3. SCOPE Literacy Dimension 2 Pretest

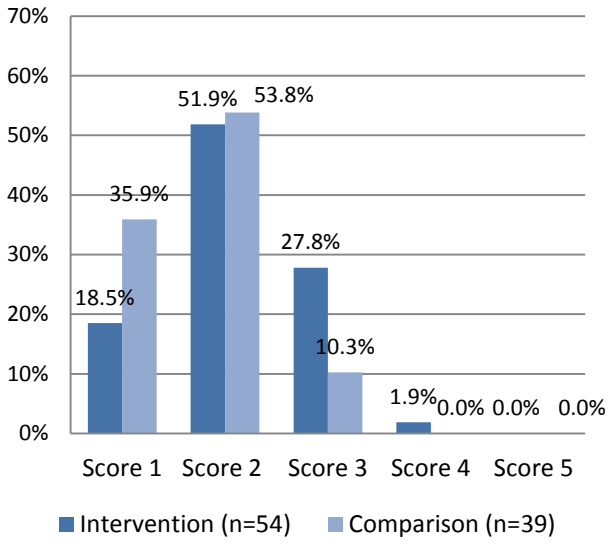
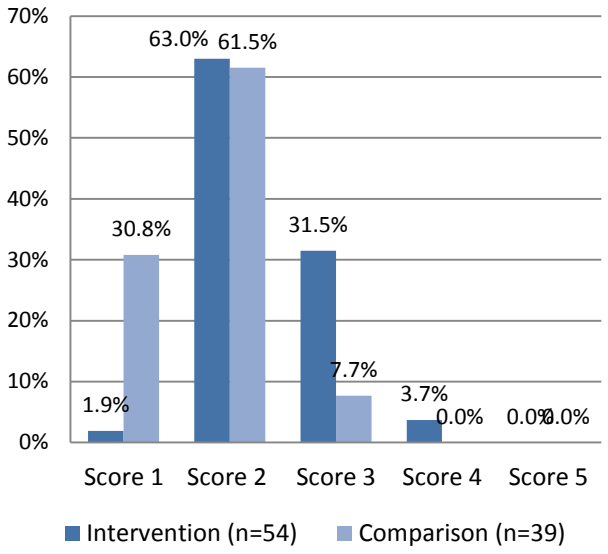


Figure 4. SCOPE Literacy Dimension 2 Posttest



The SCOPE dimension 3 focuses on teachers' application of strategies to develop students' ability to read with speed, accuracy, and proper expression. Comprehension is difficult without fluency. A student needs to be able to recognize words automatically so that he/she can focus on understanding the text without constantly stopping to decode. Strategies such as modeling expressive reading to students, asking students to read aloud or tell stories to the class, and engaging in activities such as choral reading and peer/paired reading help develop fluency. Based on the scoring criteria, results, as shown in Figure 5, indicated that at pretest, intervention group teachers scored mostly between 2 (44 percent) and 3 (35.2 percent), while those in the comparison group scored between 1 (38.5 percent) and 2 (38.5 percent). At posttest, half of the intervention teachers scored 3, a 14.8 percent gain. The percentage of those who scored 4 also increased, to 14.8 percent (see Figure 6), a 12.9 percent gain from pretest. Teachers in the comparison group also improved at posttest, with half now scoring 2, although the percentage of those who scored 3 changed only slightly.

Figure 5. SCOPE Literacy Dimension 3 Pretest

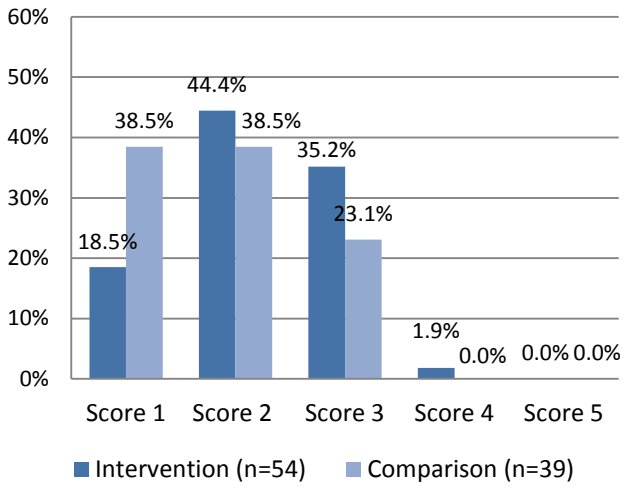
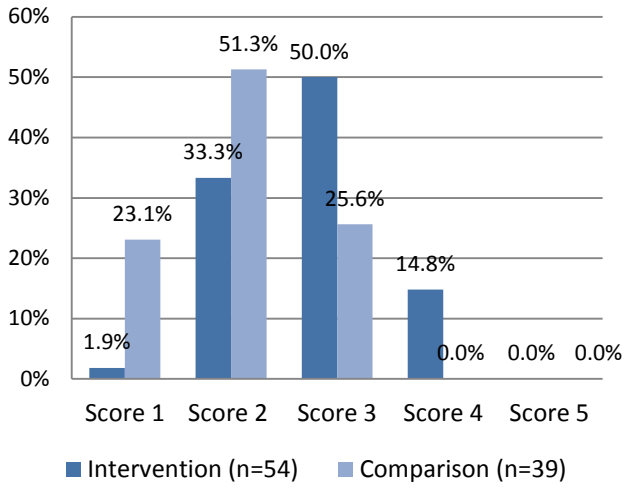


Figure 6. SCOPE Literacy Dimension 3 Posttest



Dimension 4 focuses on teachers' demonstration of diverse instructional strategies to develop their students' reading comprehension skills. A teacher who demonstrates best practice, corresponding to the highest score of 5 (see Box 6) consistently models for students, *before reading*, how to use their prior knowledge and experiences about the topic and the associated vocabulary to better understand a text. *During reading* the teacher asks students to use contextual clues to infer meaning and/or confirm predictions and understanding. Comprehension questions are a blend of the literal and inferential. *After reading* the teacher consistently and systematically requires students to infer, express their opinion, make judgments, analyze, predict, compare, and synthesize—as well as to build connections between their life experiences and the ideas presented in that text and others.

The intervention group teachers' scores varied widely at pretest: 20.4 percent scored 1, 53.7 percent scored 2, and 24.1 percent scored 3; the comparison group scored between 1 (48.7 percent) and 2 (38.5 percent) (see Figure 7). At posttest, 53.7 percent of the intervention group teachers improved their score to 3, while the percentage of those who scored 4 also increased, from 1.9 percent to 14.8 percent (see Figure 8). The proportion of comparison group teachers who scored 2 and 3 also increased at posttest, but their gain scores were less than those in the intervention group. Also at posttest, all of the intervention group teachers who had scored 1 improved to the next highest score, whereas 33 percent of those in the comparison group remained at score 1.

Figure 7. SCOPE Literacy Dimension 4 Pretest

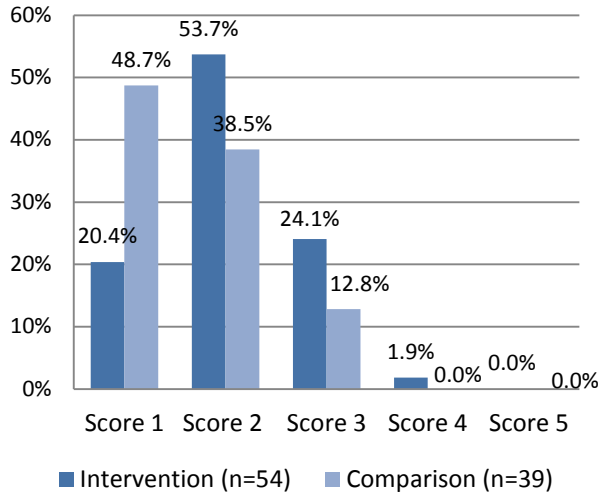
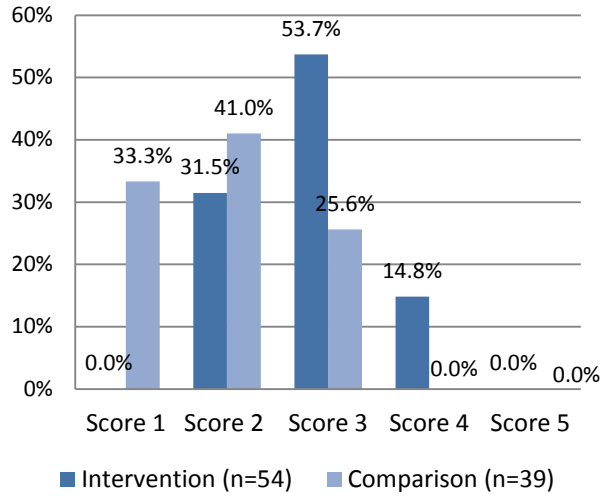


Figure 8. SCOPE Literacy Dimension 4 Posttest



In dimension 5, the best practice, corresponding to a score of 5 in the scale, is exemplified by a teacher who engages students in spontaneous writing activities on topics linked to students' experiences, texts they have read or heard, or topics of their own choice. Incorporating short and simple writing exercises after reading a story or text is a practice that is strongly encouraged as a way to develop good writers. The teacher also consistently helps students learn from their errors and take risks with their speaking and writing. The results at pretest showed that most of the teachers—77.8 percent of the intervention and 79.5 percent of the comparison group—scored 1, that is, they limited students' writing activities to copying or completing exercises. The rest of the teachers in both groups provided minimal, basic, and repetitive writing exercises, corresponding to a score of 2 (see Figure 9). These observations appear consistent with teachers' beliefs that it is very difficult for young learners to learn how to write, and with the misconception that authentic writing should be introduced no earlier than grades 3 or 4.

At posttest, the percentage of intervention group teachers who scored 1 dropped from 77.8 percent to 18.5 percent while, encouragingly, the share receiving a rating of 3 grew from 1.9 percent to 27.8 percent. Many of the teachers in the comparison group remained at score 1, although about 7.7 percent improved their score to 3 (see Figure 10).

Figure 9. SCOPE Literacy Dimension 5 Pretest

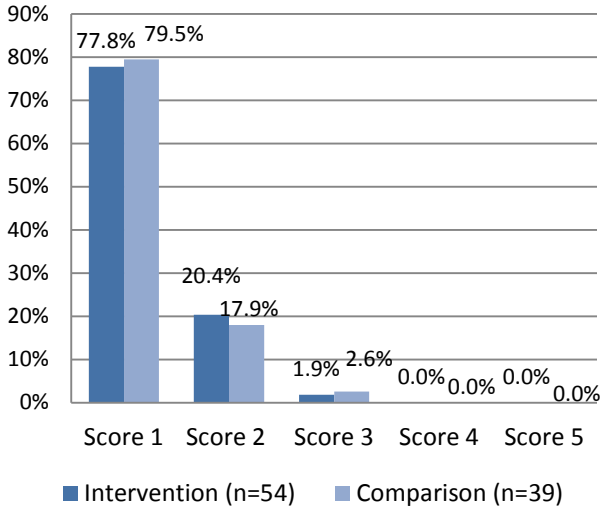
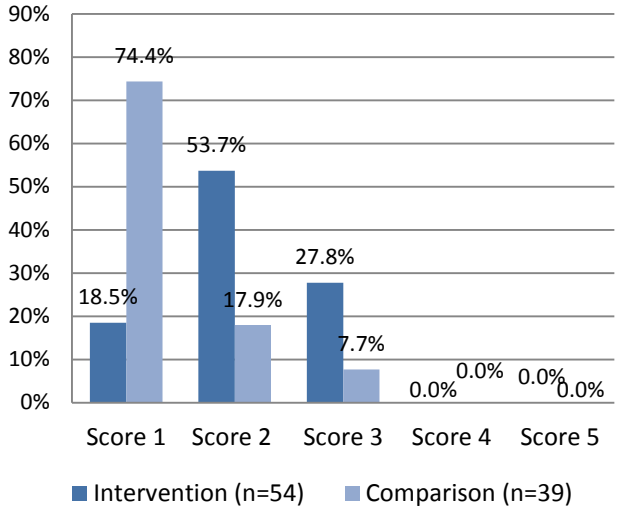


Figure 10. SCOPE Literacy Dimension 5 Posttest



Comparison of means of total SCOPE gains showed some regional differences (Table 6). Intervention group teachers in the ARMM and in District 12 gained statistically significantly more from pretest to posttest compared with the comparison group teachers (p<.05 level). Due to the small sample size in each region, however, these results need to be interpreted with caution.

Table 6. Comparison of Average SCOPE Gains by Region

	ARMM Teachers		
	Mean Gains (St. Error)	T	Sig. (2-tailed)
Intervention group (n=9)	3.11 (1.02)	2.90	.012
Comparison group (n=6)	-1.50 (1.20)		

	District 9 Teachers		
	Mean Gains (St. Error)	T	Sig. (2-tailed)
Intervention group (n=15)	4.47 (.70)	1.75	n/s
Comparison group (n=9)	2.11 (1.30)		

	District 12 Teachers		
	Mean Gains (St. Error)	T	Sig. (2-tailed)
Intervention group (n=29)	2.10 (.49)	2.18	.034
Comparison group (n=24)	.70 (.46)		

To summarize this section, the intervention group teachers scored higher on four out of five SCOPE Literacy dimensions at pretest, and higher on all five at posttest, than those in the comparison group. Both the intervention and comparison group teachers scored highest on dimension 1 of SCOPE Literacy ("Provides students with structured opportunities to develop their encoding (spelling/writing) and decoding skills"), followed by dimensions 2, 3, and 4. Both groups scored lowest on dimension 5

("Implements instruction that recognizes the importance of independent, original writing in the development of reading skills"), although the intervention group teachers demonstrated the greatest gains in this dimension from pretest to posttest. The comparison of means showed a larger gain in all five SCOPE Literacy dimensions among teachers in the intervention group ($p<.01$) than among those in the comparison group. The analysis by dimension showed statistically significant improvement among intervention group teachers in three out of five SCOPE Literacy dimensions:

- Uses diverse instructional strategies to develop students' reading fluency ($t = 2.10$; $p<.05$)
- Uses diverse instructional strategies to develop students' comprehension skills ($t = 2.71$; $p<.01$)
- Implements instruction that recognizes the importance of independent, original writing in the development of reading skills ($t = 4.70$; $p<.001$)

Results of linear regression analysis showed that the project was effective in improving instructional practices of teachers in both grades. For the second grade teachers, participation in the WSRP program was associated with an increase in the overall SCOPE score by 2.12 points (significant at $p<.05$ level). For the third grade teachers, participation in the WSRP program was associated with an increase in the overall SCOPE score by 2.32 points (significant at $p<.01$ level). The associated r-squared was found to be .135 for the second grade teachers, and .139 for the third grade teachers.

Teachers' Beliefs and Self-Reported Instructional Practices

It is widely recognized that teachers' beliefs regarding how reading and writing should be taught, together with their expectations of how students learn to read and write, impact their instructional practices (see Box 4).[3] The BIPI documents teachers' attitudes and beliefs about how students learn to read and write, as well as their perceptions of the degree to which they integrate the key practices emphasized in the training into their teaching. The BIPI consists of four sections: (A) teachers' demographic information, (B) self-reports on frequency of use of literacy-related instructional practices in the classroom, (C) statements about beliefs relative to teaching literacy, and (D) statements about students' abilities in relation to literacy. Pre- and posttest survey gains were compared by section for sections B and C; no changes were anticipated or looked for in section A on demographics.

To determine whether WSRP training resulted in a change in teachers' beliefs and attitudes about teaching reading and writing, a composite score for select practices was created. The gain score was computed from the pretest and posttest data (gain score = posttest composite – pretest composite) and then converted from the total number of questions in the composite into a percentage of correctly answered questions. The comparison of means analysis was conducted to determine if there was a difference in changes in the composite gain score between intervention and comparison group teachers. Overall, statistical analyses of changes in BIPI survey responses between pretest and posttest showed

[3] For additional information, see *Creating Effective Teaching and Learning Environments: First Results from the Teaching and Learning International Survey.* OECD, 2009.

larger overall positive change in the three BIPI sections for the intervention group than for comparison group teachers.

For Section B, a comparison of means test showed a statistically significant difference in composite scores between pretest and posttest. The change was significantly larger for the intervention group at $p<.01$ level. For section C, comparison of means test showed a statistically significant positive change in composite scores between pretest and posttest for both intervention and comparison groups; the difference in gains between the two groups was not significant. Section D was analyzed descriptively only at the dimension level, so no comparison of means test was conducted.

In general, while positive, BIPI results were also puzzling, as the data showed fluctuations and changes in beliefs among comparison group teachers. This finding suggests that the changes we have documented might be attributable to other factors beyond WSRP. It could also indicate that teachers imputed their own meanings to the questions on the survey or misunderstood them during its administration. These issues bear further examination.

Box 4 **Why are teachers' beliefs and attitudes about reading important?**

There is a general consensus from research studies that teachers hold implicit models about reading and about how students learn how to read. The beliefs underpinning these models act as "filters" through which teachers make instructional decisions.

These beliefs impact teachers' instructional practice. Teachers who regard reading as a process of acquiring a set of rules for decoding and interpreting text place a heavy emphasis on mastery and the application of phonetical rules, whereas teachers who view reading as the creative process of negotiating meaning from text tend to include in their practices diverse reading strategies such as storytelling, writing, and the sharing of ideas.

Teachers who believe that all children can learn to read tend to promote literacy development, whereas those who believe that some children are naturally incapable of learning to read tend to create a debilitating reading instruction environment.

The ways in which teachers adapt or adopt new practices in their classroom are related to whether their beliefs match the assumptions inherent in the new programs or instructional teaching methods.

Ashton (1990); Richards, Gripe, and Thompson (1987); Hollingsworth (1989); Mumby (1984).

Synthesis

The WSRP project produced positive and statistically significant improvement in both student achievement and teacher practice; it also documented attitudinal movement in a positive direction among both groups. However, our evaluation questions also asked about the associations between the results we found. These are discussed below.

Teacher Performance and Student Achievement

We found a clear association between teacher performance (as measured by SCOPE Literacy) and student achievement (as measured by EGRA). Bivariate statistical analysis showed a positive association between all five SCOPE Literacy dimensions and student achievement on EGRA subtests, as measured at posttest. The relationship was found to be robust: Pearson's r ranged between .3 and .4, which denotes

a fairly strong association. Of five SCOPE Literacy dimensions, explicit instruction in comprehension was found to be most strongly associated with all nine EGRA subtests. Instruction in the fluency dimension was found to be strongly associated with letter sounds, initial sound identification, and dictation. Predictably, instruction in the writing dimension was found to be most strongly associated with student achievement in dictation. Finally, instruction in the decoding dimension was found to be rather strongly associated with the pre-literacy skills subtests (letter naming, letter sounds, and initial sound identification), as well as invented word reading, listening comprehension, and dictation.

Correlation analysis of improvements in SCOPE Literacy and EGRA scores from pretest to posttest did not reveal any statistically significant associations between the changes in instructional practices as captured by the SCOPE Literacy and improvements in student performance on EGRA subtests, probably because instructional practices must mature before they can have a measurable impact on student achievement.

While the correlations observed between EGRA and SCOPE Literacy scores are important and suggestive, further study is required before definitive conclusions can be drawn about a causal relationship between teacher practice, as measured by SCOPE Literacy, and student performance, as measured by EGRA.

Teacher Attitudes and Teacher Performance

Correlational analysis of BIPI results and teacher observation scores showed a positive association between the Section B composite score of the BIPI survey—which asks teachers to report on the frequency of literacy-specific classroom practices they use—and teacher observation scores on all five SCOPE Literacy dimensions. Bivariate correlation analysis also found a statistically significant positive association between the Section C composite score of the BIPI survey—which asks teachers to agree or disagree with a series of statements about teaching literacy—and SCOPE Literacy scores for three out of five dimensions. Regression analysis failed to find a statistically significant association between a change in teacher beliefs and a change in instructional practices, as captured by SCOPE Literacy.

Conclusions

The WSRP was found to be effective in improving both teacher practice and student achievement. Overall key findings include the following:

- A statistical comparison of EGRA gains in achievement between intervention and comparison schools showed that intervention group second graders gained significantly more than their comparison group counterparts.
- Regression analysis showed that the intervention was particularly effective in improving overall student achievement in second grade in ARMM and in third grade in Region 9.
- Compared with non-WSRP teachers, WSRP teachers showed statistically significant improvement in three out of five SCOPE Literacy dimensions. Improvement in teacher performance was particularly pronounced in ARMM and District 12.

- Gender comparisons revealed that female students outperformed male students both in subtest results and in the degree of improvement shown between pretest and posttest.
- WSRP teachers demonstrated statistically significant positive shifts in their beliefs about teaching literacy, as measured by the BIPI survey.
- Statistical analyses of the three datasets—BIPI, SCOPE Literacy, and EGRA—showed positive patterns of change between pretest and posttest that support the WSRP model.

The full report describes findings from the data collected and analyzed for each of the evaluation questions, which may be particularly useful for education policymakers and practitioners seeking to gain a better understanding of the process of bringing about sustained improvement in reading instruction in the Philippines.

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INTRODUCTION

In 2011, EQuALLS2 piloted a whole school reading program (WSRP) in which all teachers, regardless of subject and grade, were focused on improving their own English reading skills and those of their students. Based on positive assessment results, this activity was expanded and enhanced for implementation in 53 schools in 7 divisions of Regions 9, 12 and the Autonomous Region in Muslim Mindanao (ARMM) during the 2012-13 academic year. In line with its main objectives of improving the capacity of teachers to teach in English, and increasing students' capacity to read at their grade levels, EQuALLS2 worked with the Philippine Department of Education (DepED) to develop a model for educator professional development in reading instruction that has potential replicability.

The WSRP is a school-based program designed to strengthen teachers' skills in teaching reading in order to improve students' decoding, fluency, and comprehension skills. It involves the school administrators and all English, science, and math teachers at all grade levels (1–6) in a series of activities focused on building reading, writing, listening, and speaking skills in English classes, and further reinforcing these skills in math and science classes. Anchoring the WSRP approach is the preparation of a School Reading Improvement Plan that sets goals for students reading below grade level as well as outlines activities for students reading at or above grade level. Key components of the WSRP model include professional development courses for teachers and school administrators in teaching reading and writing, and in using assessment results to inform instruction; strengthened classroom instruction focused on explicit teaching of phonics, phonemic awareness, word recognition, vocabulary development, fluency, and comprehension; development of locally produced instructional materials; technical guidance; and support from local stakeholders. The conceptual framework[4] assumed that teachers' classroom application of skills and competencies needed for students to become autonomous readers and competent writers; DepEd administrator supervision and support; and the provision of books for teaching and learning, contribute to improvements in student reading skills and student achievement. Considering that the WSRP was implemented for only 10 months, it was expected to achieve the short-term and immediate outcomes reflected in the framework.

The evaluation design recognizes a number of mediating factors or influences that might have emerged as the program unfolded. Some of these factors were changes in the subject or grade taught by the teacher, and new, competing, or complementary programs such as the mother tongue-based multi-lingual education and the new K to12 program implemented during this school year. The study also considered that changes in the fidelity of implementation, or the way teachers deliver the core components of the reading program as intended by EQuALLS2, along with other factors such as age and gender, are potential moderating factors between the interventions and the outcomes.

[4] Annex A

OVERVIEW OF REPORT

The report includes six main sections:

- Evaluation Methodology section
- Study Participants section
- Student assessment findings section
- Teacher observation findings section
- Teacher belief survey findings section
- Cross-dataset analyses and conclusions

Extensive appendices include data collection instruments, the project's conceptual framework, and results of additional statistical analyses that are not included in the main body of the report.

EVALUATION METHODOLOGY

PURPOSE AND QUESTIONS

The purpose of the evaluation study was to determine the outcomes of the whole school reading program on teaching quality and student achievement in grades 2 - 3. It aimed to assess changes in teachers' beliefs and attitudes on teaching reading, changes in teacher instructional practices in the classroom (using the SCOPE instrument explained below), and associated gains in students' reading levels, using the Early Grade Reading Assessment (EGRA). Specifically, the evaluation study was designed to answer the following questions:

1. In what ways did teachers' beliefs and attitudes on teaching reading change as a result of the intervention?
2. Were the changes in beliefs associated with changes in instructional practices in teaching reading in English?
3. Were the changes in teacher beliefs associated with students' reading skills?
4. Was there a change in teachers' practices in teaching reading in intervention schools as a result of the intervention?
5. Was there a significant improvement in the reading skills of students in grades 2 to 3 as a result of the intervention?

The evaluation also included case studies to document emerging good practices and outcomes of improvements in teachers' proficiency to teach reading in English, and strategies of DepEd contributing to sustainability of WSRP initiatives.

EVALUATION DESIGN

The evaluation is a longitudinal quasi-experimental study that follows the progress of the same group of teachers and their students in WSRP (intervention) and non-WSRP (comparison) schools across the one

school-year study period. This evaluation design was selected since the intervention schools were already identified at the start of the project in consultation with DepED using the following criteria:

- average to medium-sized schools with number of teachers ranging from 11 – 24 teachers
- must have strong leadership with demonstrated interest in supporting project objectives
- located in relatively safe and accessible areas
- at least 50% of its student population are struggling readers/non-readers based on the Phil-IRI and NAT results
- should be contiguous or cluster school in a district; preferably two districts per division

A total of 53 schools were selected to participate in the program using the above criteria. To guide the selection of comparison schools, the following criteria were used:

- approximately the same number of pupils and teachers as intervention schools
- should have equivalent or comparable Phil-IRI or National Achievement Test (NAT) scores as intervention schools
- located within the same EQuALLS2 school division
- located in a municipality with comparable socio-economic level as that of WSRP schools using National Statistics Office data.

The duration of the study was equivalent to one school year, or 10 months. Baseline data were collected in June-July, 2012 while post-intervention data were collected in February- March, 2013. The burden of the study averaged 20 to 30 minutes per participant to complete. A small number of teachers and students were asked to be interviewed or participate in a focus group for the case study, with an additional burden of up to 2 hours.

In addition to quantitative data collection, a number of qualitative case studies were constructed. Two schools, one from Region 12 and one from ARMM (Autonomous Region of Muslim Mindanao), from among the intervention schools with at least one teacher participating in the sample, were selected for these case studies after the first round of SCOPE observations. The case studies documented emerging good practices and describe how the various components of the WSRP contributing to positive outcomes. A tool for gathering qualitative data through focus group discussions (FGD) and key informant interviews (KII) with teachers and administrators was developed to better understand the findings of the teacher belief survey and student reading assessment tools. Questions related to fidelity of implementation (e.g. adherence to WSRP design; program content and quality of delivery) were imbedded in the FGD/KII tools. These case studies are presented in a separate report[5].

[5] *EQuALLS2 Whole School Reading Program: Case Studies of Two Schools in Mindanao*

SAMPLING DESIGN.

All power analyses are based on a single cohort to ensure enough power for analysis of child outcomes. Using hierarchical linear modeling, we calculated the sample size needed to detect a medium effect (δ= 0.30) at statistical power = .80, statistical significance level α = .05, and intra-class correlation ρ = .075. Using Optimal Designs software (Congdon & Raudenbush, 2001), analyses revealed a needed sample size of 74 teachers with an average of 7 children per teacher (Cohen, 1977; McCartney & Rosenthal, 2000). The actual sample size was increased to 93 second and third grade teachers given possible changes in teacher classroom assignment during the school year[6]. Up to ten randomly selected students of each of the 93 teachers were tested assuming a much higher attrition rate than the national dropout rate of 6.29%. A total of 818 students were tested. We also conducted a sensitivity analysis for the planned linear regression analyses on teacher and classroom outcomes, in order to determine the detectable effect size, with Power = 0.80 and α= 0.05, in a post-attrition sample of 74 teachers. For multiple regression with two predictors, the detectable effect size for a change in R^2 is calculated to be f^2 = 0.11, based on G*Power software (Faul, Erdfelder, Lang, & Buchner, 2007). An effect size of f2 = 0.15 is considered moderate (Cohen, 1992).

The final sample size for this evaluation was a total of 93 second and third grade teachers, with 54 teachers (58%) randomly drawn from WSRP or intervention schools, and 39 teachers (42%) from non-WSRP or comparison schools selected following the criteria above. Sampling was stratified, with equal sample sizes per grade level as summarized below[7].

Table 7. Sampled teachers, by grade

Grade Level	No. of Teachers	
	Intervention	Comparison
Second	25	19
Third	29	20
TOTAL (93)	54	39

DATA COLLECTION METHODS

Two tools were administered to teachers of both intervention and comparison schools: (i) A Teacher Belief and Practice Index[8] (see Annex B) to track self-reported changes, and (ii) a modified and

[6] Teachers were selected from the second and third grades only since these are the grades in which literacy instruction becomes crucial for student's future reading ability.

[7] The final sample included 54 intervention teachers and 39 comparison group teachers; a detailed description of the sample is found in the Study Participants chapter of the report.

[8] The BIPI was developed by EDC and has been administered to teachers in several countries. A comparison of BIPI results from Mali, Liberia and the Philippines was presented at CIES, 2011.

shortened version of SCOPE Literacy (Standards-based Classroom Observation Protocol for Educators in Literacy)[9] (Annex C). For students, electronic version of Early Grade Reading Assessment (eEGRA)[10] was used (Annex D). EGRA is a diagnostic instrument designed to assess the foundation skills for literacy acquisition of grades 1 to 3 pupils. Selected students were tested on a one-on-one basis by an e-EGRA trained enumerator. Administration of the teacher and student assessment took place according to the following schedule:

Table 8. Data collection schedule

Tool	Dates of administration	Administrators
1. Teacher Belief and Practice Survey	• Baseline- April-May 2012 • Post-Assessment: March 2013	4 Program Officers
2. SCOPE Literacy	• 1st observation – end of July • 2nd observation – February 2013	4 Program Officers and 7 DepED supervisors*
3. e-EGRA	• Pre-test - end of June to first week of July 2012 • Post-test - end of February to first week of March 2013	4 Program Officers and 8 trained DepED enumerators

*Classroom observations conducted by a Program Officer and a DepED supervisor at the same time to minimize bias and ensure validity

DATA ANALYSIS

Assessment and survey data were analyzed with Statistical Package for Social Sciences (SPSS) utilizing standard statistical methods. The results were disaggregated by sex, grade level and school type: comparison and intervention. Quantitative analyses used univariate and multivariate statistical analyses for different analytical purposes. Central tendency analysis (e.g. mean, median) were conducted for continuous demographic variables. Comparison of means statistical tests were conducted on the results of gain scores between pretests and posttests (independent samples *t*-test) and disaggregated by sex and grade level. Bivariate statistical analyses (e.g., correlations) were conducted to examine the relationship between different variables. Multivariate analyses (e.g., regression) were used to determine relationships between variables.

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[9] SCOPE Literacy is an EDC-developed tool that looks at 16 dimensions of instructional practices in literacy classrooms. It is modeled after EDC's original SCOPE, which has been used successfully in many EDC projects around the world to document changes in teaching practices in elementary classrooms. For purposes of this study, it was shortened to five essential dimensions.

[10] EGRA tests alphabetic, phonetic, and phonemic awareness (e.g. letter naming, letter-sound sound-symbol correspondence), word recognition, fluency and reading comprehension. The development of EGRA was funded by USAID and the World Bank to provide a reliable method of assessing reading skills of readers in early grades. The electronic version has been developed by EDC.

To compare the changes in scores between the comparison and intervention groups, a gain scores for each of the tests' subtests was computed based on the difference of scores on posttest and pretest for each individual. An independent samples t-test was then conducted of the difference in means for each gain score for both groups. The null hypothesis is that there is no significance in gain score between the comparison and the intervention groups. The probability that the null hypothesis is true (the p-value) was determined on the basis of the *t* score. Finally, the p-value was compared to the predetermined .05 significance level.

PROBABILITY OF SELECTION AND DESIGN WEIGHT

Only gender weights were computed for the analysis, based on the available data. The weights were computed by calculating the inverse probability of student selection out of the classroom, computed as follows. The probability of selection for students within class by gender was the total number of students sampled by gender in the class divided by the population number of students of that gender in that class:

$$posjlk = \#(\text{students sampled})jk \,/\, \#(\text{population students})jk$$

where #(students sampled)*jk* was the number of students in the jth class for the kth gender and #(population students)j was the total number of students in the *j*th class of that gender.

The weights were applied to all student-level analysis, so the tables with student- level data do not contain references to the number of sampled students. These statistics can be found in the Study Participants section of the report.

LIMITATIONS

Since it is not possible to either randomize teachers and students into participants and non-participants to assess the true impact of the program, or to conduct multiple measurements of the same group of participants given short timeframe of the study, the attribution of the observed outcomes to the program will be limited due to the quasi-experimental nature of the study. The comparison of the pretest data overall and disaggregated by gender, grade and region showed that the comparison group students scored statistically significantly lower on nine out of ten subtests. Thus, the two groups could not be considered equivalent at the beginning of the intervention. To compensate for this, all comparisons of performance of intervention and comparison group students are made in terms of their gains between the pretest and the posttest (gainscore = posttest – pretest), and analyzed using the comparison of means of independent groups test. Another threat to validity came from observers knowing whether the teachers were "intervention" (WSRP teachers) or "comparison" (non-WSRP). It is possible that observers could be positively biased toward WSRP teachers at the posttest. And finally, the teacher belief survey has not been tested for validity and reliability so the extent to which teachers answered BIPI questions truthfully is unknown. These three potential biases could have impacted the validity and reliability of the data and skewed the results.

STUDY PARTICIPANTS

TEACHER DEMOGRAPHIC CHARACTERISTICS

Teachers in the study sample were overwhelmingly female, at 90 of 93 of all respondents (or 97.8 percent). This was true for both the WSRP (intervention group) and non-WSRP (comparison group) teachers. Consequently, teacher-level analyses were not disaggregated by gender.

With respect to geographic distribution, the single largest proportion of respondents came from Region 12, at 57 percent, followed by Region 9 (26 percent) and ARMM (16 percent) (see figure 1 below for a breakout by comparison and intervention groups). South Cotabato was the most represented division in the sample (Figure 2).

Figure 11. Distribution of teachers by region

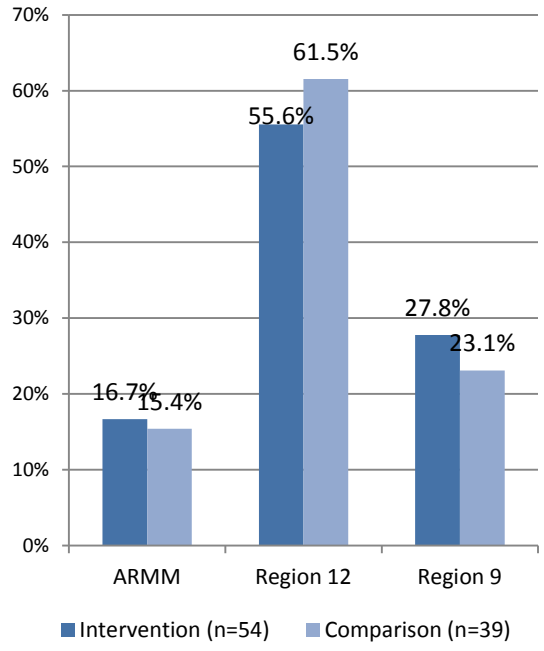
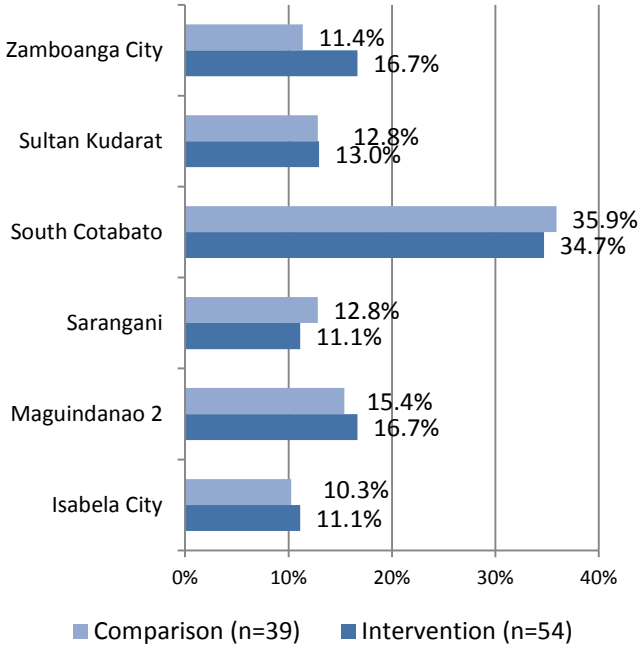
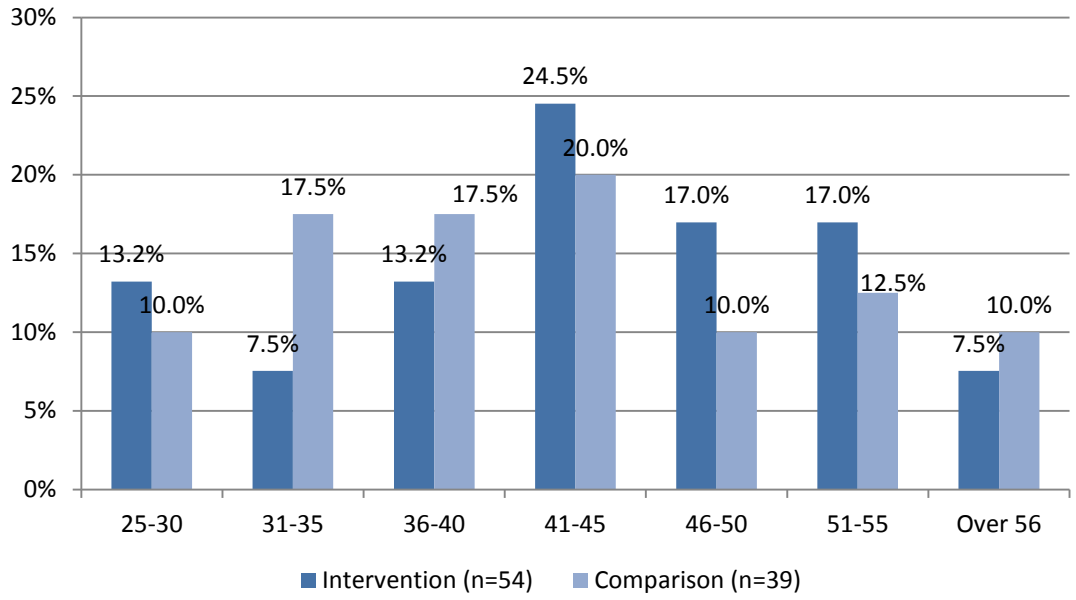


Figure 12. Distribution of teachers by division



The teacher respondents ranged in age from 25 and above with the majority being between the ages of 41 and 45.

Figure 13. Distribution of teachers by age group



Only two respondents were male and these were from the intervention group; the rest of the respondents were female.

Figure 14. Distribution of teachers by gender

				Total
		Intervention	Comparison	
Male	Count	2	0	3
	%	3.7%	0.0%	2.2%
Female	Count	52	39	90
	%	96.3%	100.0%	97.8%
Total count		54	39	93

The teachers in the sample taught either of two grades, grade 2 or 3, with slightly more teaching grade 3.

Figure 15. Distribution of teachers by grade level taught

				Total
		Intervention	Comparison	
Grade 2	Count	25	19	44
	%	46.3%	48.7%	47.3%
Grade 3	Count	29	20	49
	%	53.7%	51.3%	52.7%
Total count		54	39	93

WSRP teachers were, as a group, slightly more experienced than their non-WSRP counterparts, with 88.9 percent possessing 6 or more years of teaching experience compared to 74.4 percent for non-WSRP teachers. Regarding teacher education background, the two groups were well-matched, with the majority of teachers in both groups holding Bachelor's in Elementary Education degree.

Figure 16. Distribution of teachers by teaching experience

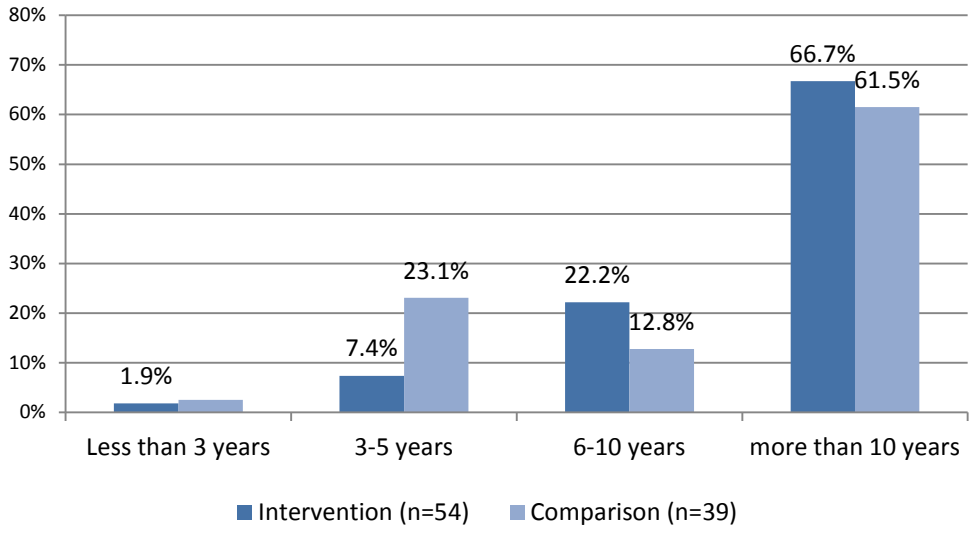
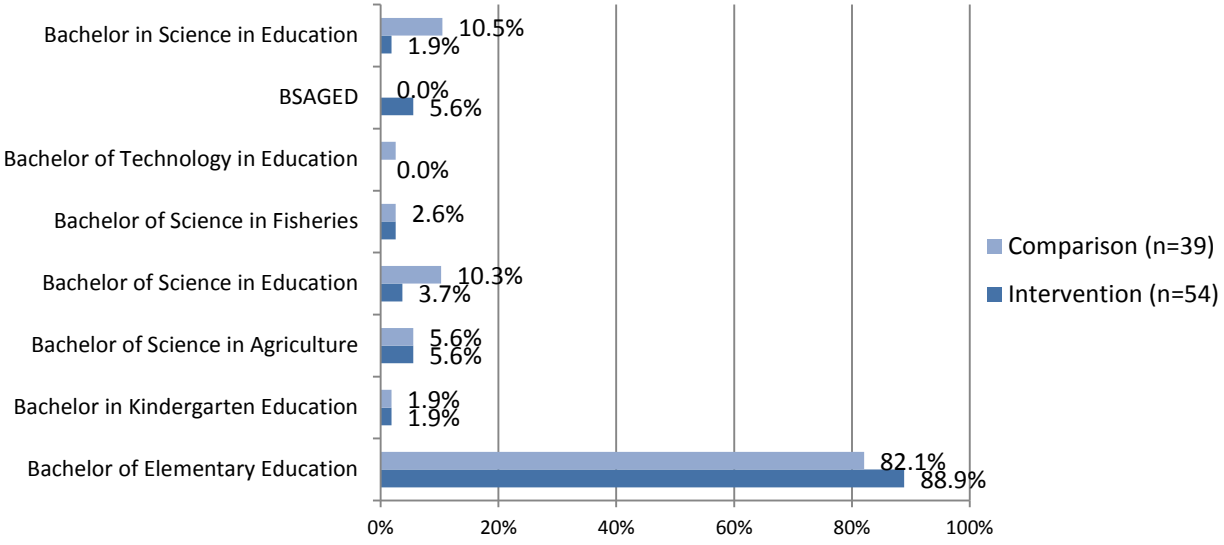


Figure 17. Distribution of teachers by type of education



STUDENT DEMOGRAPHIC CHARACTERISTICS

After data cleaning, the final dataset of student level data contained EGRA test results for a total of 818 students, with slightly more girls than boys: 50.7 percent versus 49.3 percent for boys. Intervention group students also comprised a larger proportion of the overall sample, at, 59.5 percent of the total versus 40.5 percent for the comparison schools.

Table 9. Student gender, by grade

		Grade 2 (n=391)		Grade 3 (n=427)		Total
		Intervention	Comparison	Intervention	Comparison	
Girls	Count	118	86	120	91	415
	%	50.6%	54.4%	47.2%	52.6%	50.7%
Boys	Count	115	72	134	82	403
	%	49.4%	45.6%	52.8%	47.4%	49.3%
Total count		233	158	254	173	818

Mirroring teacher sample, the majority of the student sample came from Region 12, followed by Region 9. Less than 20 percent of the student sample came from the ARMM region.

Figure 18. Distribution of grade 2 students by region

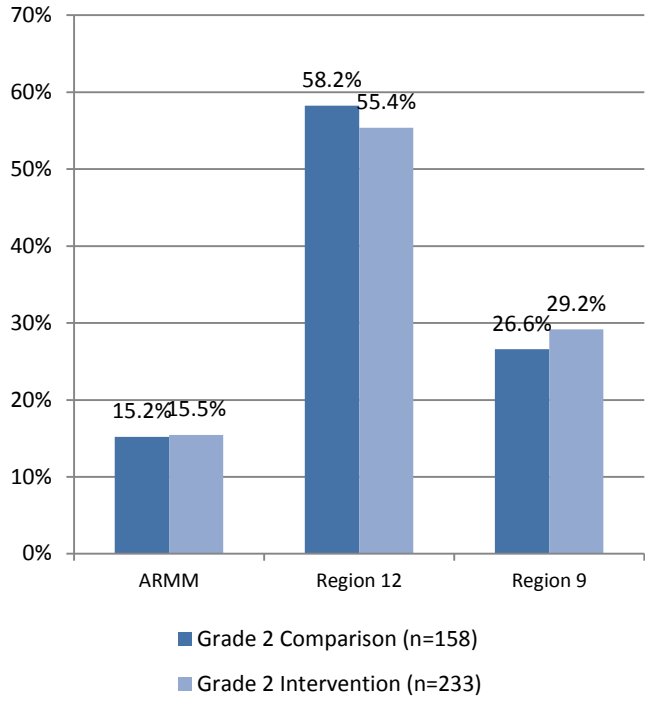
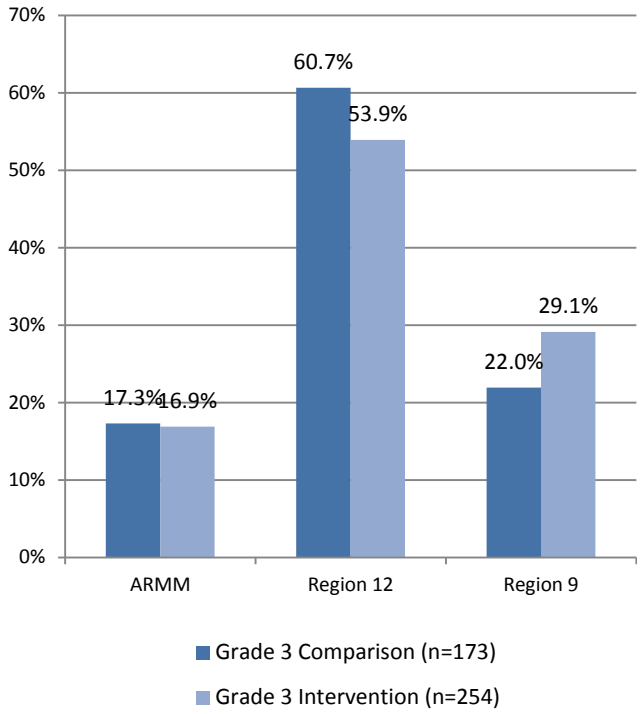


Figure 19. Distribution of grade 3 students by region



STUDENT ASSESSMENT FINDINGS

The evaluation study used Early Grade Reading Assessment (EGRA) to measure learning gains of WSRP and non-WSRP students between the beginning of the school year and the end of the school year. The EGRA instrument uses ten subtests to assess students' skills in four literacy-related areas: pre-literacy skills, fluency skills, comprehension skills, and writing skills. Overall, the data analysis showed that second grade students from the intervention group gained significantly more between the pretest and the posttest in seven out of ten subtests, compared to just one subtest that registered superior comparison group performance. In the third grade, students from the intervention group gained significantly more in three subtests, while students from the comparison group gained significantly more in two other subtests. The table below shows a summary of the statistical tests of significance of difference in learning gains between the WSRP students and the comparison group students.

Table 10. EGRA summary results, by grade

		Second grade		Third Grad	
		WSRP	**comparison**	**WSRP**	**comparison**
Pre-Literacy skills	Orientation to print	sig. (p<.05)			
	Letter naming	sig. (p<.001)		sig. (p<.01)	
	Letter sounds			sig. (p<.05)	
	Initial Sound Identification		sig. (p<.05)		sig. (p<.05)
Fluency skills	Familiar word reading	sig. (p<.01)			
	Invented word reading			sig. (p<.05)	
	Oral passage reading	sig. (p<.01)			
Comprehension skills	Reading comprehension	sig. (p<.001)			sig. (p<.001)
	Listening comprehension	sig. (p<.001)			
Writing skills	Dictation	sig. (p<.001)			

The gain difference was particularly significant for female students, with the intervention group girls registering larger gains compared to their male counterparts. In the second grade girls also outscored boys on both the pre-and the posttest. A similar, though less pronounced, gender pattern holds for third graders. The table below shows a summary of the statistical tests of significance of difference in learning gains between the WSRP students and the comparison group students, by gender.

Table 11. EGRA summary results, by grade and gender

		Second grade		Third Grad	
		WSRP girls	**WSRP boys**	**WSRP girls**	**WSRP boys**
Pre-Literacy skills	Orientation to print		sig. (p<.05)		
	Letter naming	sig. (p<.001)		sig. (p<.001)	
	Letter sounds	sig. (p<.001)			sig. (p<.01)
	Initial sound identification				
Fluency skills	Familiar word reading	sig. (p<.01)			
	Invented word reading		sig. (p<.05)	sig. (p<.05)	
	Oral passage reading	sig. (p<.05)	sig. (p<.01)		

Comprehension skills	Reading comprehension	sig. (p<.001)	sig. (p<.001)	
	Listening comprehension	sig. (p<.001)	sig. (p<.001)	
Writing skills	Dictation	sig. (p<.001)	sig. (p<.01)	sig. (p<.001)

Statistical analysis of the overall EGRA gains showed that second grade intervention group students gained statistically significantly more than second grade comparison group students. No statistically significant difference between the gains made by the third graders in the two groups was found. Thus, the intervention appeared to have been particularly effective for the second grade classrooms. The question of why third graders did not gain as much as the 2nd graders merits further inquiry.

Table 12. Comparison of EGRA gains, by grade

GRADE 2	Mean Gains (St. Error)	*t*	Sig. (2-tailed)
Intervention Group	15.376% (.396)		
Comparison Group	12.580% (.418)	4.856	.000

GRADE 3	Mean Gains (St. Error)	*t*	Sig. (2-tailed)
Intervention Group	12.397% (.309)		
Comparison Group	12.129% (.424)	.521	n/s

A comparison of means test across regions revealed substantial differences, with program found to be most effective in grade 2 in the ARMM, and Region 9 in both grades.

The overall improvement in achievement was more significant for female students than male students. Intervention group girls made larger gains in more EGRA subtests than the boys. In the second grade, girls also outscored boys on both the pre- and posttest. This pattern is also observed in the data for the third graders, although the difference between boys and girls is not as pronounced in some subscales. These results merit further inquiry.

Finally, significant difference in student learning gains was found across three regions. Intervention second graders in the ARMM region demonstrated largest overall gains as compared with comparison group students, while comparison third graders in the same region gained significantly more than intervention third graders. In Region 9, intervention third graders gained statistically significantly more than their counterparts from the comparison group. Finally, intervention second graders in Region 12 showed marginally larger average gains than comparison second graders. The table below shows the results of the comparison of means analysis of the average gains across all ten EGRA subtests, by region.

Table 13. Comparison of average EGRA gains, by grade and region

ARMM

	GRADE 2 AVERAGE GAINS			GRADE 3 AVERAGE GAINS		
	Mean Gains (St. Error)	t	Sig. (2-tailed)	Mean Gains (St. Error)	t	Sig. (2-tailed)
Intervention Group	21.86% (.87)	7.561	.000	10.06% (.80)		
Comparison Group	12.31% (.91)			15.68% (.97)	4.474	.000

Region 9

	GRADE 2 AVERAGE GAINS			GRADE 3 AVERAGE GAINS		
	Mean Gains (St. Error)	t	Sig. (2-tailed)	Mean Gains (St. Error)	t	Sig. (2-tailed)
Intervention Group	12.32% (.63)	1.419	n/s	11.59% (.44)	5.251	.000
Comparison Group	10.88% (.82)			07.04% (.85)		

Region 12

	GRADE 2 AVERAGE GAINS			GRADE 3 AVERAGE GAINS		
	Mean Gains (St. Error)	t	Sig. (2-tailed)	Mean Gains (St. Error)	t	Sig. (2-tailed)
Intervention Group	15.07% (.56)	1.984	.048	13.84% (.46)	.844	n/s
Comparison Group	13.46% (.58)			13.24% (.53)		

Regression analysis also showed that the intervention was particularly effective in improving overall student achievement in second grade in ARMM (R^2 = .157) and in third grade in Region 9 (R^2 = .049)[11]. Regression analysis also found that the intervention had a statistically significant impact in improving student achievement in the second grade in Region 12, but the amount of impact was very small (R^2 = .005). Further research is needed to understand why the intervention had different effect across regions.

[11] R-squared is a linear regression statistic that helps understand the extent to which participation in the WSRP program explains variation in student performance improvement. Converted to percentage points, R^2 of .157 means that participation in the WSPR program explained 15.7 percent of variance in the overall achievement improvement among ARMM second graders; R^2 of .049 means that participation in the WSPR program explained nearly 5 percent of variance in the overall achievement improvement among District 9 third graders, and the R^2 of .005 means that participation in the WSPR program explains a half of one percent of variance in the overall achievement improvement among District 12 second graders. These results show that the program made a substantial impact on the EGRA performance of ARMM second graders, moderate impact on the EGRA performance of Region 9 third graders, and small impact on the EGRA performance of Region 12 second graders. Complete results of regression analysis are found in Annex E.

A comparison of overall and gender-disaggregated pretest data showed that the comparison group students scored statistically significantly lower on nine out of ten subtests. Thus, the two groups could not be considered equivalent at the beginning of the intervention. Consequently, the analyses for the EGRA subtests are done not for the posttest results of the students, but rather for the amount gained between the pretest and the posttest.

PRE-LITERACY SKILLS

Pre-literacy skills are considered to be a crucial predictor of students' later success with reading and writing. Particularly in earlier grades when many students have not yet mastered reading fluently, testing pre-literacy skills reveals important information about their future literacy potential. Students from WSRP and non-WSRP schools were tested in four areas of pre-literacy skills:

- Orientation to print
- Letter naming
    - Percent completed
    - Speed (letters per minute)
- Letter sounds
    - Percent completed
    - Speed (sounds per minute)
- Initial Sound Identification

PRE-LITERACY SKILLS: GRADE 2

The analysis of student posttest results showed that second graders in the intervention group could name on average 66 letters per minute and could sound 42 letters per minute, compared with 53 letters named per minute and 31 letters sounded per minute by the comparison group students.

With respect to orientation to print and letter naming, grade two intervention students gained significantly more between the pre- and post-test compared to their non-WSRP counterparts. Despite scoring lower on the initial sound identification subtest, comparison group students showed larger gains between tests than students from intervention schools. The difference in gains in letter sounds was not significant, with the intervention group students scoring higher at both pretest and the posttest.

Table 14. Results for EGRA pre-literacy skills subtests, grade 2

		GRADE 2 STUDENTS		
		Pretest mean (St. Error)	Posttest mean (St. Error)	Gain score (St. Error)
Orientation to print (% correct; 3 questions)	Intervention	82.6% (1.07)	93% (0.696)	10.4%* (1.303)

	Comparison	75.2% (1.285)	81.5% (1.207)	6.3% (1.533)
Letters named (% correct; 100 letters)	Intervention	48.2%‡ (0.844)	66.1% (0.874)	17.9%***(0.754)
	Comparison	39.6% (0.852)	52.7% (0.999)	13.1% (0.689)
Letters named (letters per minute)	Intervention	48.8‡ (0.854)	66.9 (0.944)	18.2*** (0.813)
	Comparison	39.7 (0.872)	52.8 (1.007)	13.1 (0.694)
Letter sounds (% correct; 100 letters)	Intervention	32.2%‡ (0.64)	42.1% (0.626)	9.9% (0.641)
	Comparison	21.1% (0.597)	30.7% (0.753)	9.5% (0.599)
Letter sounds (letter sounds per minute)	Intervention	34.3‡ (1.004)	42.2 (0.626)	7.7 (1.002)
	Comparison	25.5 (1.381)	30.7 (0.753)	5.2 (1.306)
Initial sound identification (% correct; 10 words)	Intervention	72.6%‡ (1.055)	87.4% (0.742)	14.9% (0.91)
	Comparison	48.5% (1.424)	66.8% (1.35)	18.4%* (1.152)

‡ The group's pretest mean score is statistically higher compared with the other group's score, at *p*<.01 level.

*The group's gain score is statistically significantly higher than the other group's at *p* <.05 level

**The group's gain score is statistically significantly higher than the other group's at *p* <.01 level

***The group's gain score is statistically significantly higher than the other group's at *p* <.001 level

Charts below illustrate frequency distributions of the main pre-literacy subtests, presented as quintiles.

Figure 20. 2nd Grade Intervention Group - Letters Naming Subtest Frequency Distribution

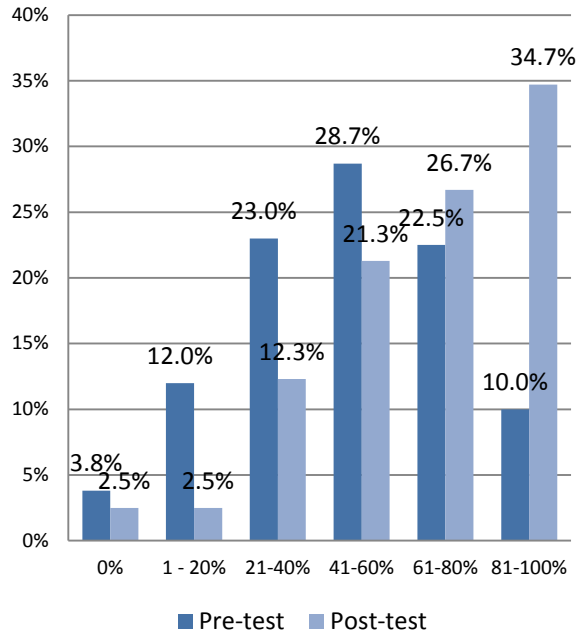


Figure 21. 2nd Grade Comparison Group - Letters Naming Subtest Frequency Distribution

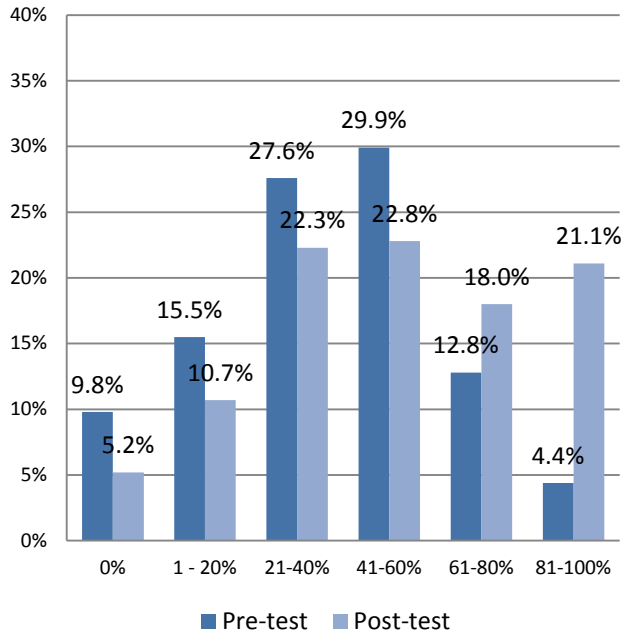


Figure 22. 2nd Grade Intervention Group - Letters Sounds Subtest Frequency Distribution

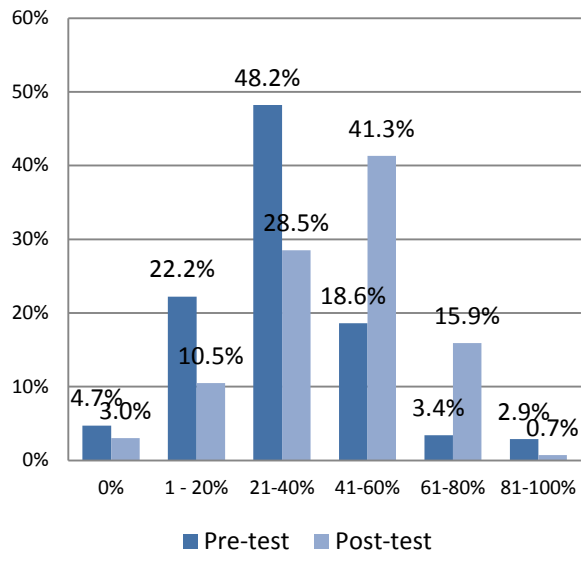
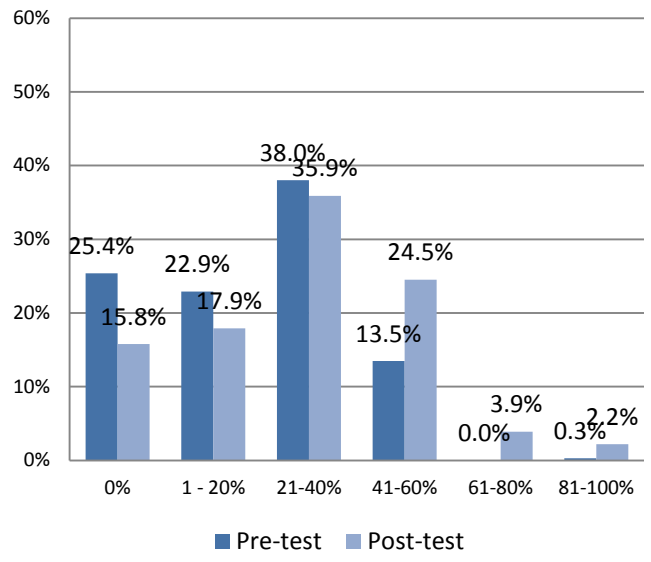


Figure 23. 2nd Grade comparison Group - Letters Sounds Subtest Frequency Distribution



The analysis of letter naming and letter sounds distributions both in intervention and in comparison groups shows normally distributed pattern of achievement, with the majority of students falling in the middle range of the scale. Second grade students appear to have better skills in naming letters than in sounding them: very few students in both intervention and comparison group scored above 60 percent in the letter sounds test.

An analysis of the initial sound identification subtest showed a different pattern of achievement, with most students scoring either very high (intervention group), or split between very high and very low (comparison group). Very few students scored in the middle range of 20 to 60 percent. These results demonstrate the need for differentiation of instruction in the sound identification.

Figure 24. 2nd Grade Intervention Group - Initial Sound Identification Subtest Frequency Distribution

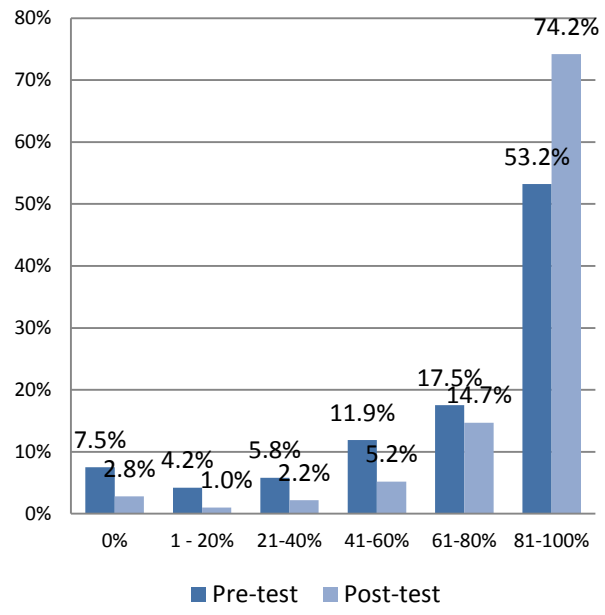
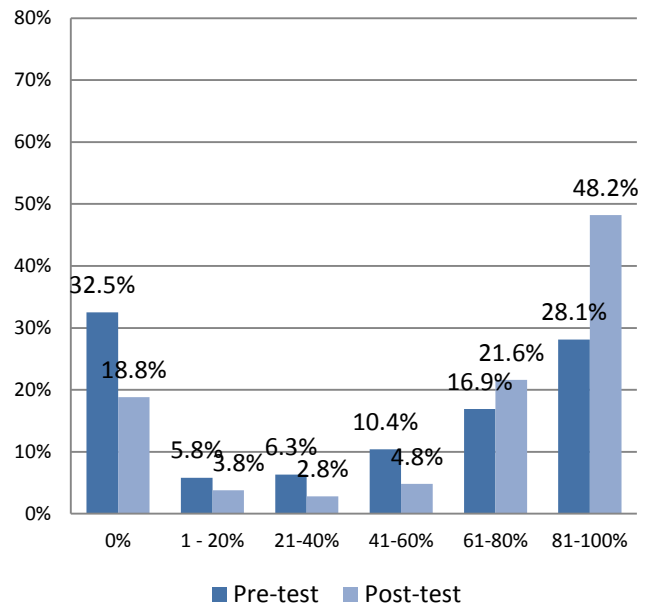


Figure 25. 2nd Grade Comparison Group - Initial Sound Identification Frequency Distribution



The data analysis by gender showed that the second grade girls significantly outperformed boys in the posttest results. Intervention group girls named on average 73 letters per minute (compared with 61 letters named by boys), and sounded 47 letters per minute (compared with 38 letters by boys). There was no such difference in the speed of letter naming and sounding between comparison group boys and girls: both of these groups averaged about 51 to 54 letters per minute in letter naming subtest, and 31 letters in letter sounds subtest. Girls scored higher than boys in the initial sound identification subtest.

Girls also made larger gains than boys between the pretest and the posttest. In the intervention group, this difference between boys and girls is statistically significant for the letter naming subtest ($p<.01$), letter sounding ($p<.001$), and in the initial sound identification ($p<.001$) subtests. In the comparison group, girls gained more than boys in the letter sounds per minute ($p<.01$) and in the initial sound identification ($p<.001$) subtests.

Table 15. Results for EGRA pre-literacy skills subtests, grade 2, by gender

GRADE 2		GIRLS			BOYS		
		Pretest mean (St. Error)	Posttest mean (St. Error)	Gain score (St. Error)	Pretest mean (St. Error)	Posttest mean (St. Error)	Gain score (St. Error)
Orientation to print (% correct; 3 questions)	Intervention	84% (1.49)	92.3% (1.041)	8.2% (1.869)	81.2% (1.532)	93.7% (0.926)	12.5%* (1.814)
	Comparison	78.8% (1.661)	86.3% (1.482)	7.5% (1.767)	71.3% (1.965)	76.2% (1.9)	5% (2.558)
Letters named (%	Intervention	51.7%‡	72%	20.3%***	44.9%‡	60.5%	15.6%*

correct; 100 letters)		(1.073)	(1.111)	(1.07)	(1.28)	(1.29)	(1.052)
	Comparison	39.9% (1.215)	54.2% (1.337)	14.3% (0.927)	39.2% (1.193)	51.1% (1.491)	11.8% (1.023)
Letters named (letters per minute)	Intervention	51.8‡ (1.095)	73.4 (1.3)	21.7*** (1.234)	45.9‡ (1.289)	60.6 (1.302)	14.8* (1.044)
	Comparison	40.1 (1.248)	54.4 (1.361)	14.3 (0.927)	39.1 (1.213)	51.1 (1.491)	11.8 (1.037)
Letter sounds (% correct; 100 letters)	Intervention	34.4%‡ (0.85)	46.7% (0.907)	12.3%*** (0.919)	30%‡ (0.942)	37.5% (0.809)	7.5% (0.881)
	Comparison	22.6% (0.849)	30.8% (1.042)	8.2% (0.8)	19.6% (0.83)	30.5% (1.089)	11.0%* (0.893)
Letter sounds (letter sounds per minute)	Intervention	35.1‡ (0.999)	46.7 (0.907)	11.7** (1.06)	33.6 (1.72)	37.7 (0.81)	3.9 (1.668)
	Comparison	22.6 (0.849)	30.8 (1.042)	8.2 (0.8)	28.6 (2.72)	30.5 (1.089)	1.9 (2.571)
Initial sound identification (% correct; 10 words)	Intervention	77.9%‡ (1.341)	89% (1.038)	11.1% (1.101)	67.4%‡ (1.585)	85.9% (1.057)	18.6% (1.422)
	Comparison	55.6% (1.957)	69.2% (1.822)	13.6% (1.507)	40.7% (2.005)	64.3% (1.999)	23.6%* (1.722)

‡ The group's pretest mean score is statistically higher compared with the other group's score, at $p<.01$ level.
*The group's gain score is statistically significantly higher than the other group's at $p<.05$ level
**The group's gain score is statistically significantly higher than the other group's at $p<.01$ level
***The group's gain score is statistically significantly higher than the other group's at $p<.001$ level

To better understand the student performance in these subtests, a frequency distribution of all responses was grouped into quintiles is presented in Annex F which also shows the distribution of the incorrect responses on the letter naming and letter sounds subtests. Both groups showed fewer than 6 percent of incorrect answers on these two subtests, with a subsequent decrease in this proportion for both on the posttest. As the data analysis of incorrect responses by gender shows, the proportion of letters named and sounded incorrectly was rather small: between 3 and 6 percent at the posttest, with girls doing better than boys, and intervention group students doing better than comparison group students. The proportion of incorrect answers on the letter naming and letter sounds subtests by intervention and comparison group boys decreased between the pretest and the posttest by 1.4 percent. For most girls the proportion of incorrect answers also decreased at the posttest, except for girls from the comparison group who showed a slight increase in the proportion of the incorrect answers.

Disaggregation by region revealed interesting patters of student performance. At the pretest, second graders from ARMM region performed significantly better than second graders from Region 12. Achievement gains of students from Region 9 fell somewhere in the middle between the ARMM and the Region 12 students. Second graders from the ARMM also registered statistically significantly higher gains comparing to the students from Region 9. Their actual posttest achievement was also significantly higher than results from both Region 9 and Region 12.

Of the three regions, only Region 12 showed substantial differences between intervention and comparison groups during the pretest.

Table 16. Results for EGRA pre-literacy subtests in, grade 2, by region

		ARMM GRADE 2 STUDENTS		
		Pretest mean (St. Error)	Posttest mean (St. Error)	Gain score (St. Error)
Orientation to print (% correct; 3 questions)	Intervention	88.2% (2.287)	96.5% (0.833)	8.4% (2.276)
	Comparison	78.9% (2.665)	87% (2.11)	8.1% (3.104)
Letters named (% correct; 100 letters)	Intervention	49.3% (1.746)	72.1% (1.609)	22.8%* (1.726)
	Comparison	50.3% (2.2)	66.5% (2.255)	16.2% (1.869)
Letters named (letters per minute)	Intervention	49.3 (1.746)	72.1 (1.609)	22.8* (1.726)
	Comparison	51.0 (2.303)	67.1 (2.319)	16.1 (1.874)
Letter sounds (% correct; 100 letters)	Intervention	34% (1.254)	55.4% (1.089)	21.4%*** (1.271)
	Comparison	29.9% (1.343)	43.8% (1.831)	13.9% (1.26)
Letter sounds (letter sounds per minute)	Intervention	34 (1.254)	55.4 (1.089)	21.4*** (1.271)
	Comparison	39 (3.136)	43.8 (1.831)	4.8 (3.101)
Initial sound identification (% correct; 10 words)	Intervention	80.5%‡ (2.498)	94.7% (0.796)	14.2% (2.069)
	Comparison	55.6% (3.17)	74% (2.764)	18.4% (2.056)

		REGION 9 GRADE 2 STUDENTS		
		Pretest mean (St. Error)	Posttest mean (St. Error)	Gain score (St. Error)
Orientation to print (% correct; 3 questions)	Intervention	91.1%‡ (1.238)	85.2% (1.721)	-5.9% (1.953)
	Comparison	77% (2.15)	76.9% (2.715)	-0.1% (3.104)
Letters named (% correct; 100 letters)	Intervention	47.6% (1.577)	64.2% (1.716)	16.6%** (1.377)
	Comparison	42.3% (1.391)	53.2% (1.572)	10.8% (1.187)
Letters named (letters per minute)	Intervention	49.1 (1.575)	66.6 (2.059)	17.7** (1.653)
	Comparison	42.2 (1.422)	53.2 (1.572)	10.9 (1.215)
Letter sounds (% correct; 100 letters)	Intervention	24% (0.789)	32.9% (0.998)	8.9%** (0.753)
	Comparison	22.2% (1.041)	27.8% (1.308)	5.6% (1.011)
Letter sounds (letter sounds per minute)	Intervention	29.8 (2.508)	33.2 (1.005)	3.1 (2.432)
	Comparison	30.9 (4.045)	27.8 (1.308)	-3.1 (3.767)
Initial sound identification (% correct; 10 words)	Intervention	69.5%‡ (1.656)	85.4% (1.33)	15.8% (1.625)
	Comparison	57.4% (2.427)	70.4% (2.239)	13% (1.96)

		REGION 12 GRADE 2 STUDENTS		
		Pretest mean (St. Error)	Posttest mean (St. Error)	Gain score (St. Error)
Orientation to print (% correct; 3 questions)	Intervention	75.6% (1.713)	96.6% (0.736)	20.9%*** (1.953)
	Comparison	72.7% (1.922)	81.6% (1.62)	8.9% (2.116)

Letters named (% correct; 100 letters)	Intervention	48.2%‡ (1.197)	65.3% (1.215)	17.1%** (1.046)
	Comparison	33.7% (1.085)	46.8% (1.391)	13.1% (0.89)
Letters named (letters per minute)	Intervention	48.4‡ (1.226)	65.4 (1.221)	16.9** (1.069)
	Comparison	33.7 (1.085)	46.8 (1.391)	13.1 (0.89)
Letter sounds (% correct; 100 letters)	Intervention	36.5%‡ (1.001)	43.1% (0.856)	6.6% (1.019)
	Comparison	17% (0.784)	26.8% (0.935)	9.8%* (0.872)
Letter sounds (letter sounds per minute)	Intervention	37.2‡ (1.119)	43.1 (0.856)	5.9 (1.131)
	Comparison	17.1%(0.792)	26.8 (0.935)	9.7** (0.869)
Initial sound identification (% correct; 10 words)	Intervention	71.8%‡ (1.559)	86.3% (1.143)	14.5% (1.295)
	Comparison	40.9% (2.002)	62.1% (2.012)	21.2%** (1.775)

‡ The group's pretest mean score is statistically higher compared with the other group's score, at $p<.01$ level.
*The group's gain score is statistically significantly higher than the other group's at $p<.05$ level
**The group's gain score is statistically significantly higher than the other group's at $p<.01$ level
***The group's gain score is statistically significantly higher than the other group's at $p<.001$ level

PRE-LITERACY SKILLS: GRADE 3

On average, third graders from the intervention group named 78 letters per minute (compared with 68 letters per minute in the comparison group), and sounded 41 letters per minute (compared with 38 letters per minute in the comparison group). For two of the subtests, the intervention students scored significantly higher at the pretest, as well as at the posttest.

Overall, intervention group students showed higher gains between the pretest and the posttest compared to the comparison group students on two subtests: letter naming and letter sounds (per minute). Similarly to the second grade results, the comparison group students showed larger gains in the initial sound identification subtest.

Table 17. Results for EGRA pre-literacy skills subtests, grade 3

		GRADE 3 STUDENTS		
		Pretest mean (St. Error)	Posttest mean (St. Error)	Gain score (St. Error)
Orientation to print (% correct; 3 questions)	Intervention	84.1% (0.848)	92.2% (0.616)	8.1% (1.005)
	Comparison	83.1% (1.172)	88.2% (0.92)	5.1% (1.44)
Letters named (% correct; 100 letters)	Intervention	61.6%‡ (0.699)	77.3% (0.662)	15.7% (0.542) ***
	Comparison	55% (0.952)	67% (0.948)	12.1% (0.778)
Letters named (letters per minute)	Intervention	61.7 (0.719)	78.1 (0.694)	16.2 (0.574)**
	Comparison	55.2 (0.974)	68.6 (1.04)	13.3 (0.823)
Letter sounds (% correct; 100 letters)	Intervention	30% (0.489)	41.2% (0.522)	11.1% (0.518)

	Comparison	28.4% (0.835)	37.9% (0.692)	9.5% (0.831)
Letter sounds (letter sounds per minute)	Intervention	30.1 (0.522)	41.2 (0.522)	11 (0.573)*
	Comparison	30.5 (1.494)	37.9 (0.692)	7.4 (1.515)
Initial sound identification (% correct; 10 words)	Intervention	73.9%‡ (0.894)	87.6% (0.645)	13.8% (0.768)
	Comparison	58.4% (1.419)	76.4% (1.134)	18% (1.11)**

‡ The group's pretest mean score is statistically higher compared with the other group's score, at *p*<.01 level.
*The group's gain score is statistically significantly higher than the other group's at *p* <.05 level
**The group's gain score is statistically significantly higher than the other group's at *p* <.01 level
***The group's gain score is statistically significantly higher than the other group's at *p* <.001 level

Charts below illustrate frequency distributions of the main pre-literacy subtests, presented as quintiles. These distributions show a similar of results to the second graders. Third graders also did better with letter naming than with letter sounds. Both letter naming and letter sounds subtest results had normal distribution, with most students scoring in the mid-range.

Initial sound identification subtest showed results similar to the second grade with the U-shape distribution, particularly in the comparison group.

Figure 26. 3rd Grade Intervention Group – Letter Naming Subtest Frequency Distribution

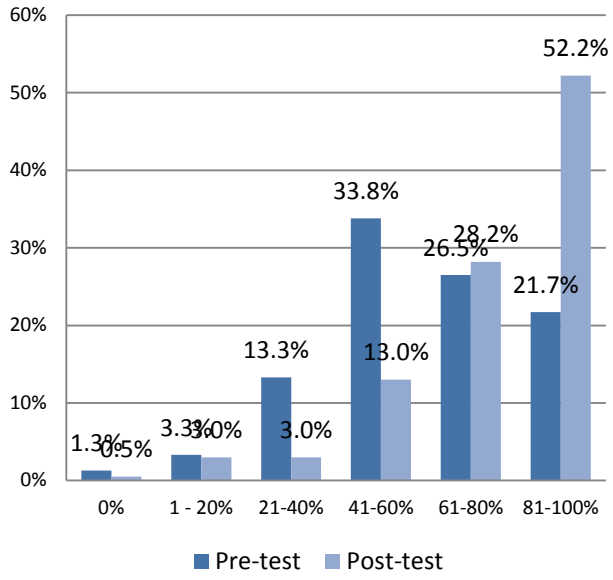


Figure 27. 3rd Grade Comparison Group – Letter Naming Subtest Frequency Distribution

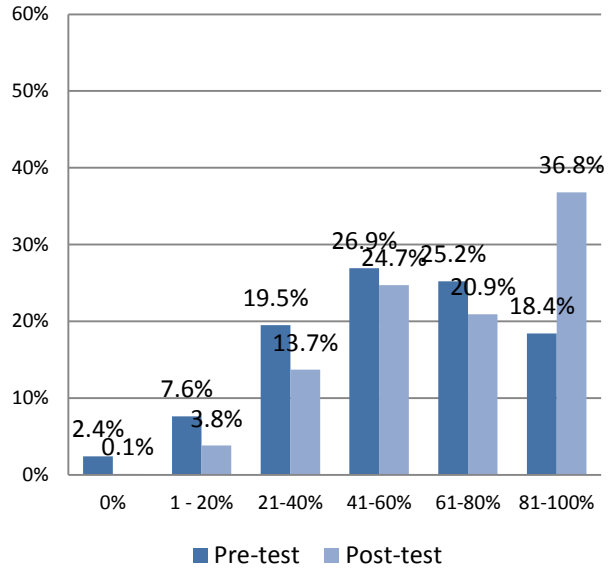


Figure 28. 3rd Grade Intervention Group – Letter Naming Subtest Frequency Distribution

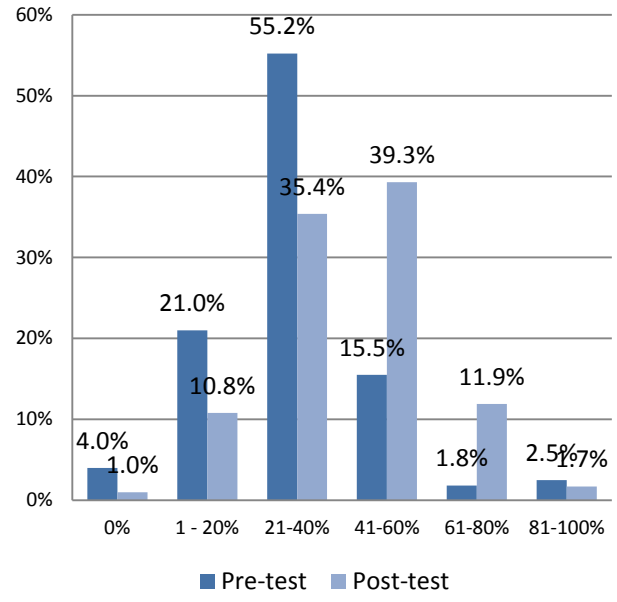


Figure 29. 3rd Grade Comparison Group – Letter Naming Subtest Frequency Distribution

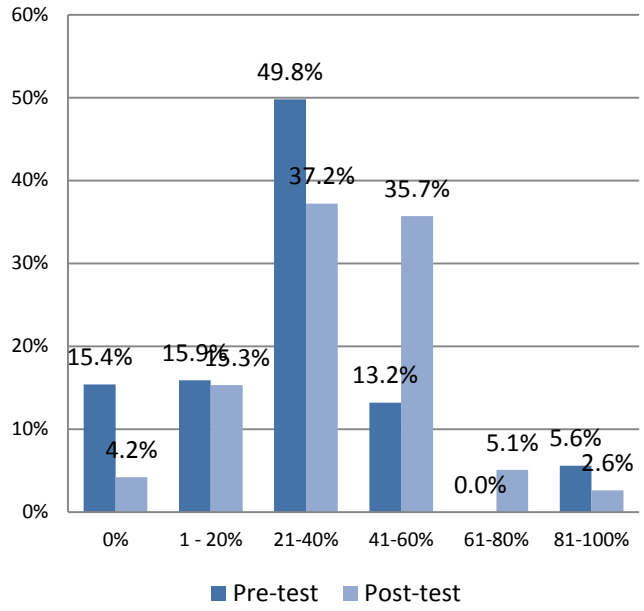


Figure 30. 3rd Grade Intervention Group – Initial Sound Identification Subtest Frequency Distribution

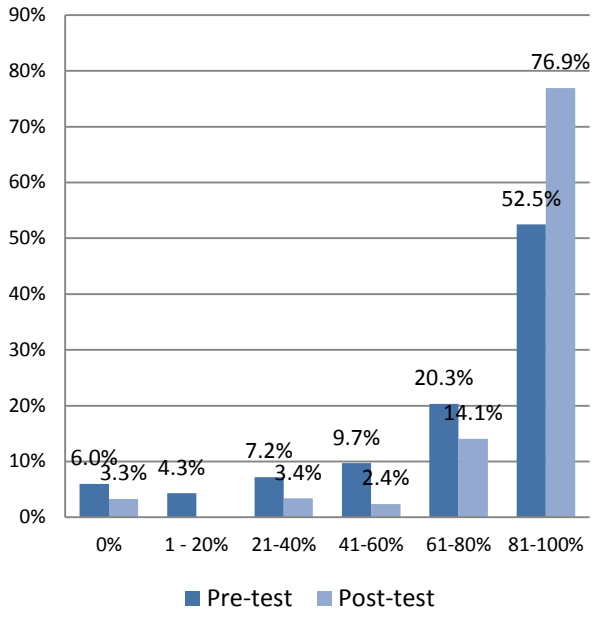
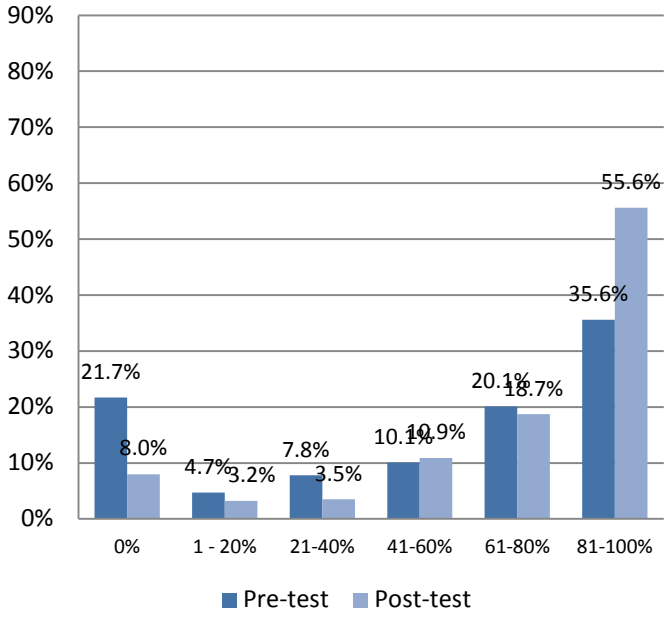


Figure 31. 3rd Grade Comparison Group – Initial Sound Identification Subtest Frequency Distribution



Like their second grade counterparts, the third grade girls significantly outperformed boys in their posttest results. Intervention group girls named on average 85 letters per minute (compared with 73

letters named by boys), and sounded 44 letters per minute (compared with 39 letters by boys). The difference in the speed of letter naming and sounding between comparison group boys and girls was smaller: girls averaged 70 letters per minute in the letter naming subtest, and 41 letters per minute on the letter sounds subtest, compared to an average 67 and 45 letters, respectively, for boys. Girls also scored 10 percentage points higher than boys on the initial sound identification subtest.

The gender comparison table below shows that most of the difference between the intervention and comparison group students is accounted for by the performance of intervention group girls, who gained significantly more between the pretest and posttest than girls from the comparison group.

Third grade girls in the intervention group also performed significantly better than boys in letter naming (p<.001) and the initial sound identification (p<.05) subtests.

Table 18. Results for EGRA pre-literacy skills subtests, grade 3, by gender.

GRADE 3		GIRLS			BOYS		
		Pretest mean (St. Error)	Posttest mean (St. Error)	Gain score (St. Error)	Pretest mean (St. Error)	Posttest mean (St. Error)	Gain score (St. Error)
Orientation to print (% correct; 3 questions)	Intervention	85.5% (1.11)	91.7% (0.977)	6.2% (1.553)	82.9% (1.253)	92.7% (0.779)	9.8% (1.306)
	Comparison	82.1% (1.751)	88.2% (1.3)	6.1% (2.134)	84.2% (1.527)	88.1% (1.301)	4% (1.903)
Letters named (% correct; 100 letters)	Intervention	65.8%‡ (0.954)	83.2% (0.842)	17.3%*** (0.72)	58%‡ (0.984)	72.4% (0.948)	14.4% (0.791)
	Comparison	59.5% (1.29)	69.2% (1.258)	9.7% (1.132)	49.9% (1.362)	64.7% (1.424)	14.8% (1.037)
Letters named (letters per minute)	Intervention	66.3 (0.99)	84.5 (0.92)	18.2*** (0.797)	57.8 (1.006)	72.7 (0.965)	14.5 (0.812)
	Comparison	59.6 (1.303)	70.3 (1.353)	10.6 (1.194)	50.3 (1.417)	66.6 (1.597)	16.3 (1.102)
Letter sounds (% correct; 100 letters)	Intervention	32.8% (0.737)	44.3% (0.782)	11.4% (0.725)	27.7% (0.636)	38.5% (0.682)	10.9% (0.735)
	Comparison	30.8% (1.154)	40.9% (0.936)	10.1% (0.992)	25.8% (1.196)	34.7% (0.999)	8.9% (1.367)
Letter sounds (letter sounds per minute)	Intervention	32.4 (0.697)	44.3 (0.782)	11.7 (0.713)	28.2 (0.755)	38.5 (0.682)	10.3** (0.868)
	Comparison	30 (1.103)	40.9 (0.936)	10.8 (0.938)	31 (2.9)	34.7 (0.999)	3.7 (3.003)
Initial sound identification (% correct; 10 words)	Intervention	80.1% (1.112)	91.8% (0.75)	11.7% (1.003)	68.5% (1.321)	84.1% (0.988)	15.6% (1.134)
	Comparison	65% (1.849)	81.3% (1.325)	16.3%** (1.331)	51.1% (2.115)	71% (1.847)	19.9%* (1.816)

‡ The group's pretest mean score is statistically higher compared with the other group's score, at p<.01 level.

*The group's gain score is statistically significantly higher than the other group's at p <.05 level

**The group's gain score is statistically significantly higher than the other group's at p <.01 level

***The group's gain score is statistically significantly higher than the other group's at p <.001 level

An analysis of incorrect responses[12] on the letter naming and letter sounds subtests showed a decrease in the proportion of the incorrect answers in both intervention and comparison groups; the proportion was similar but slightly higher in the comparison group. Overall, the average rate of incorrect answer at the posttest was between 2 and 5 percent.

The data analysis of incorrect responses by gender shows that the proportion of letters named and sounded incorrectly was very small: between 1 and 6 percent at the posttest, with girls doing better than boys. The proportion of incorrect answers on letter naming and letter sounds subtests by intervention and comparison group boys and girls decreased between the pretest and the posttest by a small margin. The largest decrease was found for comparison group girls (2.4 percent).

Tables in Annex F show frequency distributions of student performance data grouped into quintiles.

Disaggregation by region showed dramatic differences between intervention and comparison groups at the pretest. While intervention groups in the ARMM and Region 12 scored significantly higher than the comparison group counterparts at the pretest, in Region 9 the situation was the reverse, with the comparison group third graders showing better results at the pretest. At the posttest, the ARMM third graders did better than counterparts from Region 12, and somewhat similar to students form Region 9. In terms of achievement gains, students from the ARMM and Region 12 gained significantly more than students from Region 9, accounting for gains made by both intervention and comparison groups.

Table 19. Results for EGRA pre-literacy subtests, grade 3, by region

		ARMM GRADE 3 STUDENTS		
		Pretest mean (St. Error)	Posttest mean (St. Error)	Gain score (St. Error)
Orientation to print (% correct; 3 questions)	Intervention	91%‡ (1.154)	90.9% (1.583)	-0.1% (2.055)
	Comparison	77.4% (3.056)	83.8% (2.178)	6.4% (3.666)
Letters named (% correct; 100 letters)	Intervention	73.8%‡ (1.433)	81.5% (1.355)	7.7% (0.69)
	Comparison	46.1% (1.729)	57.4% (1.72)	11.2%** (1.172)
Letters named (per minute)	Intervention	74.7‡ (1.592)	81.5 (1.355)	6.4 (0.83)
	Comparison	46.1 (1.729)	57.4 (1.72)	11.2** (1.172)
Letter sounds (% correct; 100 letters)	Intervention	38.2%‡ (1.355)	53.6% (1.291)	15.4% (1.144)
	Comparison	17.9% (1.774)	31.5% (1.167)	13.6% (1.811)
Letter sounds (per minute)	Intervention	38.2 (1.355)	53.6 (1.291)	15.4** (1.144)
	Comparison	29.2 (6.462)	31.5 (1.167)	2.3 (6.479)
Initial sound identification (% correct; 10 words)	Intervention	84.2%‡ (1.823)	95% (0.71)	10.8% (1.847)
	Comparison	34.2% (3.208)	67.9% (2.571)	33.7%*** (3.091)

[12] Annex F

		REGION 9 GRADE 3 STUDENTS		
		Pretest mean (St. Error)	Posttest mean (St. Error)	Gain score (St. Error)
Orientation to print (% correct; 3 questions)	Intervention	87.6% (1.287)	90.8% (1.165)	3.3%*** (1.739)
	Comparison	96%‡ (0.949)	82.8% (2.279)	-13.2% (2.45)
Letters named (% correct; 100 letters)	Intervention	67.3% (0.97)	83.4% (0.813)	16.1%*** (0.838)
	Comparison	74.6%‡ (1.468)	79.8% (1.699)	5.2% (1.717)
Letters named (per minute)	Intervention	67.4 (0.993)	85 (0.938)	17.5*** (0.916)
	Comparison	75.7‡ (1.598)	85.7 (2.17)	10 (2.075)
Letter sounds (% correct; 100 letters)	Intervention	25.3% (0.683)	38.4% (0.833)	13.1%*** (0.746)
	Comparison	36.4%‡ (2.113)	37% (1.054)	0.7% (2.286)
Letter sounds (per minute)	Intervention	24.5 (0.556)	38.4 (0.833)	13.6*** (0.714)
	Comparison	35.6‡ (2.18)	37 (1.054)	1.2 (2.436)
Initial sound identification (% correct; 10 words)	Intervention	70.2% (1.536)	84.9% (1.391)	14.7%* (1.284)
	Comparison	67.8% (2.128)	77.4% (2.044)	9.6% (1.606)

		REGION 12 GRADE 3 STUDENTS		
		Pretest mean (St. Error)	Posttest mean (St. Error)	Gain score (St. Error)
Orientation to print (% correct; 3 questions)	Intervention	79.1% (1.416)	93.7% (0.785)	14.6% (1.461)
	Comparison	79% (1.714)	92.4% (0.985)	13.3% (1.82)
Letters named (% correct; 100 letters)	Intervention	53.1%‡ (1.024)	71.7% (1.075)	18.6%* (0.892)
	Comparison	48.9% (1.251)	64.5% (1.307)	15.7% (1.058)
Letters named (per minute)	Intervention	53.1‡ (1.027)	72.3 (1.109)	19.1* (0.905)
	Comparison	48.9 (1.251)	64.5 (1.307)	15.7 (1.058)
Letter sounds (% correct; 100 letters)	Intervention	30% (0.666)	38.1% (0.671)	8.2% (0.809)
	Comparison	28.6% (0.871)	40.8% (1.067)	12.2%** (0.771)
Letter sounds (per minute)	Intervention	30.5 (0.8)	38.1 (0.671)	7.6 (0.953)
	Comparison	28.6 (0.87)	40.8 (1.067)	12.2** (0.773)
Initial sound identification (% correct; 10 words)	Intervention	72.2% ‡ (1.316)	86.6% (0.888)	14.4% (1.113)
	Comparison	62.9% (1.934)	79.1% (1.567)	16.2% (1.411)

‡ The group's pretest mean score is statistically higher compared with the other group's score, at $p<.01$ level.

*The group's gain score is statistically significantly higher than the other group's at $p<.05$ level

**The group's gain score is statistically significantly higher than the other group's at $p<.01$ level

***The group's gain score is statistically significantly higher than the other group's at $p<.001$ level

FLUENCY SKILLS

Fluency refers to a student's speed of accurate reading of unconnected words or a connected text. Fluency is a fundamental characteristic that defines good readers, and is considered to be a skill that bridges decoding and comprehension. The section of EGRA designed to test students' reading fluency and automaticity included three subtests:

- Familiar word reading
  - Percent completed
  - Speed (words per minute)
- Invented word reading
  - Percent completed
  - Speed (words per minute)
- Oral passage reading
  - Percent completed
  - Speed (words per minute)

These three subsets measure different skills. The familiar word reading subset integrates decoding skills and recognition of sight words (commonly used words) skills. Invented word reading tests students' decoding abilities. Oral passage reading tests students' ability to read a connect text and understand its meaning.

FLUENCY SKILLS: GRADE 2

The following table presents the results of fluency testing of grade 2 students in both the intervention and comparison groups. The intervention group students scored significantly higher at the pretest in all of the fluency subtests. Although students in both groups gained substantially between the pretest and the posttest, students in the intervention group demonstrated larger gains in the speed of reading of familiar words and in both percent completed and speed of the oral passage reading.

Table 20. Results for EGRA fluency subtests, grade 2

		ALL GRADE 2 STUDENTS		
		Pretest mean (St. Error)	Posttest mean (St. Error)	Gain score (St. Error)
Familiar word reading (% correct; 50 words)	Intervention	53.5%‡ (1.159)	74.1% (1.064)	20.6% (0.754)
	Comparison	37.1% (1.285)	55.9% (1.391)	18.8% (0.856)
Familiar word reading (words per minute)	Intervention	29.5‡ (0.758)	40.4 (0.689)	10.8** (0.59)
	Comparison	20.3 (0.832)	28.7 (0.737)	8.4 (0.665)
Invented word reading (% correct; 50 words)	Intervention	50.7%‡ (1.162)	70.4% (1.061)	19.6% (0.74)

	Comparison	37% (1.345)	56.3% (1.431)	19.3% (1.091)
Invented word reading (words per minute)	Intervention	26.5‡ (0.638)	36.5 (0.591)	10 (0.439)
	Comparison	20.5 (0.851)	28.9 (0.764)	8.5 (0.818)
Oral passage reading (% correct; 61 words)	Intervention	50.8%‡ (1.262)	72% (1.153)	21.2%* (0.846)
	Comparison	34.9% (1.417)	53.3% (1.466)	18.4% (0.991)
Oral passage reading (words per minute)	Intervention	34.1‡ (0.938)	48.1 (0.911)	14.0** (0.71)
	Comparison	22.9 (0.964)	33.7 (0.955)	10.8 (0.687)

‡ The group's pretest mean score is statistically higher compared with the other group's score, at $p<.01$ level.
*The group's gain score is statistically significantly higher than the other group's at $p<.05$ level
**The group's gain score is statistically significantly higher than the other group's at $p<.01$ level
***The group's gain score is statistically significantly higher than the other group's at $p<.001$ level

Charts below illustrate frequency distributions of the main pre-literacy subtests, presented as quintiles. All three distributions are U-shaped, particularly among the comparison group students, indicating a wide range of abilities among the students. Comparison group distributions show similarly high percent of students scoring zero and 100 percent, with fewer than half of third grade students falling in the middle. This type of distribution presents a huge challenge for educators, since adapting the instruction to such varied levels of skills requires additional resources.

Figure 32. 2nd Grade Intervention Group - Familiar Word Reading Subtest Frequency Distribution

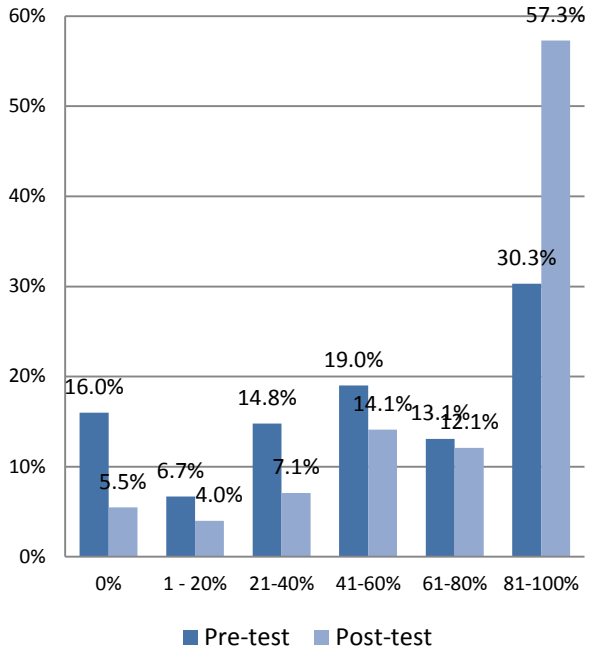


Figure 33. 2nd Grade Comparison Group - Familiar Word Reading Subtest Frequency Distribution

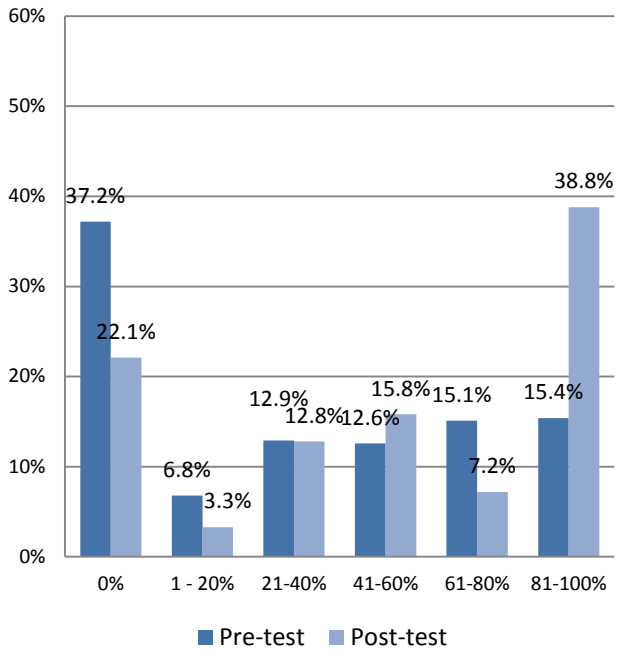


Figure 34. 2nd Grade Intervention Group - Invented Word Reading Subtest Frequency Distribution

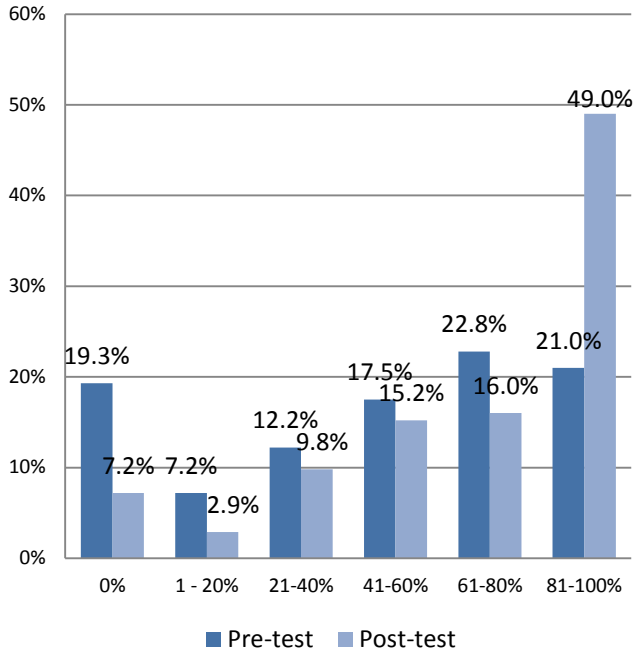


Figure 35. 2nd Grade Comparison Group - Invented Word Reading Subtest Frequency Distribution

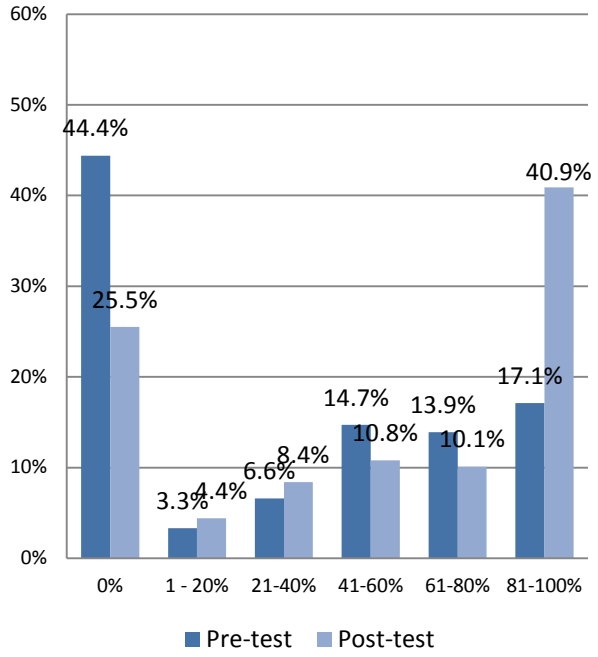


Figure 36. 2nd Grade Intervention Group - Oral Passage Reading Subtest Frequency Distribution

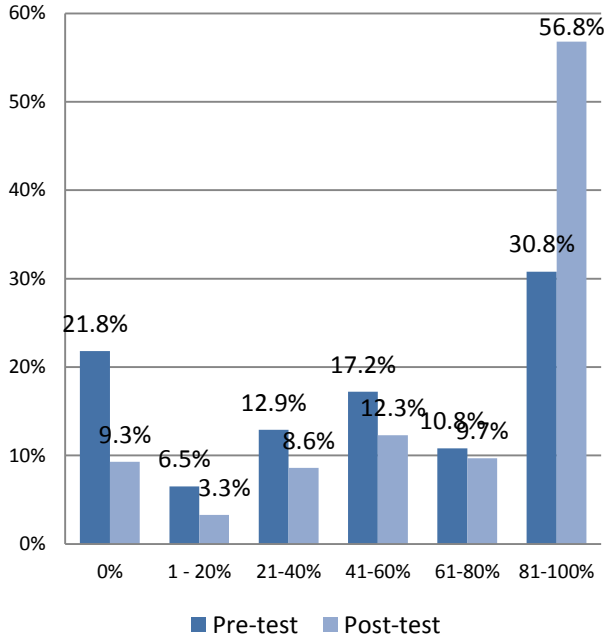
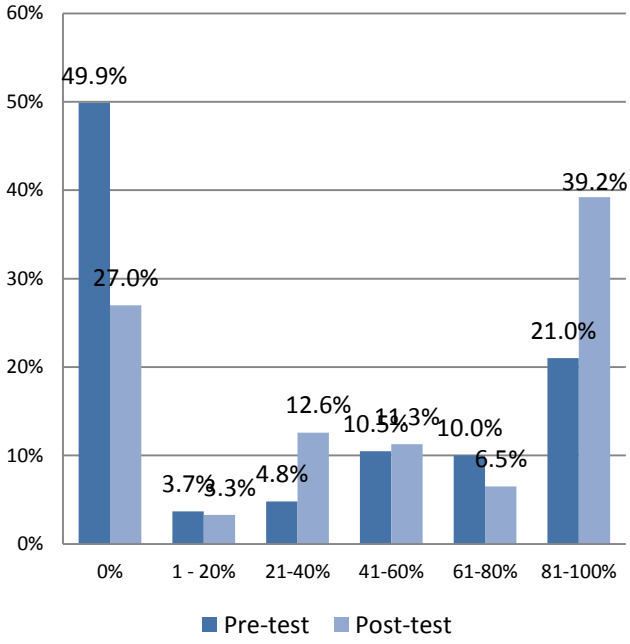


Figure 37. 2nd Grade Comparison Group - Oral Passage Reading Subtest Frequency Distribution



Turning to gender, second grade girls from both groups scored higher than their male counterparts on almost all subtests, on both the pretest and posttest. On average at the posttest, intervention group girls read 79 percent of the connected text within the allocated amount of time, read 81 percent of the familiar words subtest within the allocated amount of time, and decoded 79 percent of the invented words subtest within the allocated amount of time. Intervention group boys read 65 percent of the connected text within the allocated amount of time, read 67 percent of the familiar words subtest within the allocated amount of time, and decoded 63 percent of the invented words subtest within the allocated amount of time. Consequently, the intervention group girls read connected text faster than boys, with an average speed of 54 words per minute, compared to 42 words per minute for boys. Girls were also faster at decoding familiar words (45 words per minute, compared with 36 words per minute decoded by boys) as well as invented words (42 words per minute, compared with 32 words per minute decoded by boys).

Comparison group girls also read faster than comparison group boys. The average speed of reading a connected text for girls was 37 words per minute, compared with 30 words per minute read by boys. Comparison group girls decoded 30 familiar words per minute (compared with 27 decoded by boys), and 31 invented words per minute (compared with 27 decoded by boys).

Finally, intervention group girls gained more than boys with respect to familiar word reading speed ($p<.05$) and decoding of invented words speed ($p<.01$). In the comparison group, girls gained more than boys in the speed oral passage reading ($p<.01$), as well as speed and percent of decoding unfamiliar words (both subtests ($p<.01$).

Table 21. Results for EGRA fluency subtests, grade 2, by gender

GRADE 2		GIRLS			BOYS		
		Pretest mean (St. Error)	Posttest mean (St. Error)	Gain score (St. Error)	Pretest mean (St. Error)	Posttest mean (St. Error)	Gain score (St. Error)
Familiar word reading (% correct; 50 words)	Intervention	59.2%‡ (1.539)	81.1% (1.3)	21.9%** (0.994)	48%‡ (1.689)	67.3% (1.614)	19.3% (1.128)
	Comparison	40.1% (1.847)	57.5% (1.905)	17.4% (1.315)	33.9% (1.767)	54.1% (2.033)	20.3% (1.07)
Familiar word reading (words per minute)	Intervention	32.9‡ (1.07)	45.1 (0.934)	12.1** (0.86)	26.3‡ (1.053)	35.9 (0.963)	9.6 (0.807)
	Comparison	22.8 (1.323)	30.1 (1.055)	7.4 (1.149)	17.6 (0.958)	27.2 (1.021)	9.5 (0.602)
Invented word reading (% correct; 50 words)	Intervention	57.5%‡ (1.573)	78.5% (1.296)	20.9% (1.001)	44.1% (1.65)	62.5% (1.585)	18.4% (1.085)
	Comparison	37.2% (1.84)	59.3% (1.927)	22.1% (1.246)	36.8% (1.97)	53% (2.118)	16.2% (1.817)
Invented word reading (words per minute)	Intervention	29.9‡ (0.855)	41.2 (0.776)	11.2 (0.608)	23.2 (0.917)	32 (0.834)	8.7* (0.627)
	Comparison	20.1 (1.136)	31.2 (1.087)	11.1 (0.989)	20.9 (1.278)	26.5 (1.06)	5.6 (1.312)
Oral passage reading (% correct; 61 words)	Intervention	57.5%‡ (1.795)	78.8% (1.524)	21.3% (1.315)	44.2%‡ (1.719)	65.3% (1.669)	21.1%* (1.072)

	Comparison	38.7% (2.026)	57.7% (2.028)	19% (1.185)	30.7% (1.953)	48.5% (2.098)	17.8% (1.618)
Oral passage reading (words per minute)	Intervention	39.3‡ (1.374)	54.3 (1.337)	15.0* (1.163)	29.1‡ (1.235)	42 (1.172)	12.9** (0.824)
	Comparison	25.1 (1.353)	37.3 (1.375)	12.1 (0.829)	20.4 (1.366)	29.7 (1.291)	9.3 (1.111)

‡ The group's pretest mean score is statistically higher compared with the other group's score, at $p<.01$ level.
*The group's gain score is statistically significantly higher than the other group's at $p<.05$ level
**The group's gain score is statistically significantly higher than the other group's at $p<.01$ level
***The group's gain score is statistically significantly higher than the other group's at $p<.001$ level

With respect to the three fluency subtests (familiar word reading, invented word decoding, and oral passage reading), the highest error rates at the posttest level were on reading of familiar words (around 10 percent for both groups), followed by decoding of invented words (between 7 and 9 percent), with the lowest rate in the oral reading (6 percent in both groups). Intervention and comparison groups showed a decrease of between .5 and 2 percent in words read incorrectly between the pretest and the posttest.

Gender analysis of the three fluency subtests (familiar word reading, invented word decoding, and oral passage reading) showed a similar pattern in incorrect responses across sexes. For both boys and girls, the highest error rate at the posttest level was in the reading of familiar words, followed by decoding of invented words, with the lowest rate in the oral reading. The rate of improvement between the pretest and the posttest was the highest among the intervention group girls (3.5 percent reduction in incorrect words in the oral reading passage).

To better understand student performance in these subtests, frequency distributions were grouped in quintiles and presented in Annex F.

Disaggregation by region showed substantial differences across regions. Intervention groups in Regions 9 and 12 scored significantly higher on the pretest than comparison groups, while in the ARMM region the comparison group scored significantly higher on most subtests. Posttest results showed superior achievement by the ARMM students, comparing to the Regions 9 and 12 students. In terms of overall achievement gains on fluency subtests, second graders from all three regions gained roughly similar amount.

Table 22. Overall results for EGRA fluency subtests, grade 2, by region

		ARMM GRADE 2 STUDENTS		
		Pretest mean (St. Error)	Posttest mean (St. Error)	Gain score (St. Error)
Familiar word reading (% correct; 50 words)	Intervention	51% (2.453)	81.8% (1.915)	30.8%*** (1.556)
	Comparison	59.9%‡ (2.975)	77.4% (2.614)	17.5% (1.489)

Familiar word reading (per minute)	Intervention	26.5 (1.379)	40.9 (0.957)	14.4* (0.942)
	Comparison	33‡ (1.769)	39.5 (1.379)	6.5 (0.978)
Invented word reading (% correct; 50 words)	Intervention	51.4% (2.325)	74.5% (2.056)	23.2%* (1.598)
	Comparison	59.5%‡ (2.972)	77.4% (2.544)	17.9% (1.45)
Invented word reading (per minute)	Intervention	25.7 (1.163)	37.3 (1.028)	11.6** (0.799)
	Comparison	30.8‡ (1.595)	39.3 (1.323)	8.5 (0.776)
Oral passage reading (% correct; 61 words)	Intervention	46.9% (2.662)	78.7% (2.157)	31.8%*** (1.66)
	Comparison	60.6%‡ (3.319)	72.3% (2.849)	11.7% (2.418)
Oral passage reading (words per minute)	Intervention	29 (1.673)	48 (1.316)	19.1*** (1.063)
	Comparison	41.4‡ (2.393)	44.7 (1.787)	3.3 (1.773)

REGION 9 GRADE 2 STUDENTS

		Pretest mean (St. Error)	Posttest mean (St. Error)	Gain score (St. Error)
Familiar word reading (% correct; 50 words)	Intervention	49.3%‡ (2.143)	66.8% (2.064)	17.5% (1.418)
	Comparison	27.8% (2.045)	49.7% (2.533)	21.9%* (1.943)
Familiar word reading (per minute)	Intervention	27.1‡ (1.305)	42.3 (1.65)	15.2* (1.124)
	Comparison	13.9 (1.023)	26.3 (1.422)	12.4 (1.029)
Invented word reading (% correct; 50 words)	Intervention	45.3% (2.063)	64.6% (2.008)	19.3% (1.338)
	Comparison	37.1% (2.545)	55.2% (2.551)	18.1% (3.094)
Invented word reading (per minute)	Intervention	23.9 (1.101)	35.6 (1.247)	11.6* (0.847)
	Comparison	24.2 (2.169)	29.8 (1.554)	5.6 (2.696)
Oral passage reading (% correct; 61 words)	Intervention	49.4%‡ (2.345)	66.9% (2.268)	17.5% (1.797)
	Comparison	28% (2.423)	48.8% (2.625)	20.8% (2.038)
Oral passage reading (words per minute)	Intervention	33.3‡ (1.709)	52.6 (2.213)	19.3* (1.486)
	Comparison	17.2 (1.474)	32.2 (1.852)	14.9 (1.354)

REGION 12 GRADE 2 STUDENTS

		Pretest mean (St. Error)	Posttest mean (St. Error)	Gain score (St. Error)
Familiar word reading (% correct; 50 words)	Intervention	56.9%‡ (1.627)	76% (1.473)	19.1% (1.019)
	Comparison	32.7% (1.699)	50.3% (1.938)	17.6% (1.15)
Familiar word reading (per minute)	Intervention	32.1‡ (1.142)	39.1 (0.824)	6.9 (0.826)
	Comparison	18.5 (1.251)	25.6 (1.007)	7.1 (1.084)
Invented word reading (% correct; 50 words)	Intervention	53.8%‡ (1.692)	72.5% (1.49)	18.7% (1.054)
	Comparison	27.8% (1.676)	48.2% (2.049)	20.5% (1.212)
Invented word reading (per minute)	Intervention	28.3‡ (0.961)	36.9 (0.79)	8.4 (0.617)
	Comparison	14.3 (0.882)	24.2 (1.035)	10 (0.629)

Oral passage reading (% correct; 61 words)	Intervention	52.8%‡ (1.78)	72.8% (1.593)	19.9% (1.049)
	Comparison	28% (1.799)	47.8% (2.084)	19.9% (1.226)
Oral passage reading (words per minute)	Intervention	36.3‡ (1.378)	45.3 (1.046)	9.1 (0.925)
	Comparison	18.2 (1.224)	29.9 (1.334)	11.7 (0.813)

‡ The group's pretest mean score is statistically higher compared with the other group's score, at $p<.01$ level.
*The group's gain score is statistically significantly higher than the other group's at $p<.05$ level
**The group's gain score is statistically significantly higher than the other group's at $p<.01$ level
***The group's gain score is statistically significantly higher than the other group's at $p<.001$ level

FLUENCY SKILLS: GRADE 3

Grade 3 students demonstrated overall high levels of speed with respect to reading familiar words, decoding invented words, and reading an oral passage. At the posttest, the average percent of subtest completion within the allocated amount of time in these three subtests was between 75 and 85 percent. The average oral passage reading speed was 54 words per minute in the comparison group, and 64 words per minute in the intervention group. The average speed of decoding familiar words was 44 words per minute in the comparison group, and 51 words per minute in the intervention group. The difference in the speed of decoding invented words was similar: 40 words per minute in the comparison group, and 46 words per minute in the intervention group.

The intervention group students read faster and more accurately than their comparison group counterparts on both the pre- and the posttest, with students in both groups gaining in fluency by under 15 percent. Statistically significantly gains for the intervention group were registered on only one subtest: speed of reading of invented words. The difference in the gain score between the two groups in the remaining subtests was not significant.

Table 23. Results for EGRA fluency subtests, grade 3

		ALL GRADE 3 STUDENTS		
		Pretest mean (St. Error)	Posttest mean (St. Error)	Gain score (St. Error)
Familiar word reading (% correct; 50 words)	Intervention	71%‡ (0.995)	85.8% (0.789)	14.8% (0.733)
	Comparison	61.8% (1.404)	75.5% (1.281)	13.7% (0.831)
Familiar word reading (words per minute)	Intervention	42.8 (0.799)	50.8 (0.698)	8.0 (0.783)
	Comparison	35.5 (0.921)	43.9 (0.963)	8.4 (0.645)
Invented word reading (% correct; 50 words)	Intervention	68.5%‡ (0.966)	83% (0.803)	14.5% (0.561)
	Comparison	59.9% (1.446)	72.9% (1.32)	13% (0.848)
Invented word reading (words per minute)	Intervention	37 (0.593)	45.9 (0.581)	8.8* (0.475)

	Comparison	32.1 (0.825)	39.4 (0.793)	7.3 (0.532)
Oral passage reading (% correct; 61 words)	Intervention	72.8%‡ (1.045)	85.5% (0.817)	12.7% (0.66)
	Comparison	61.5% (1.524)	75.2% (1.356)	13.7% (0.817)
Oral passage reading (words per minute)	Intervention	57.8 (1.072)	63.9 (0.906)	6.1 (0.877)
	Comparison	47.5 (1.371)	54.3 (1.235)	6.8 (0.841)

‡ The group's pretest mean score is statistically higher compared with the other group's score, at *p*<.01 level.
*The group's gain score is statistically significantly higher than the other group's at *p* <.05 level
**The group's gain score is statistically significantly higher than the other group's at *p* <.01 level
***The group's gain score is statistically significantly higher than the other group's at *p* <.001 level

Charts below illustrate frequency distributions of the main pre-literacy subtests, presented as quintiles. These distributions show that the majority of students in both intervention and comparison groups managed to read 100 percent words in all three fluency subtests, within the allocated amount of time. Between one in four and one in five comparison group third graders read fewer than 20 percent of words in the three subtests at the pretest, compared with only one in ten, on average, in the intervention group. At the posttest, two-thirds to three-quarters students read 100 percent of words in the three subtests.

Figure 38. 3rd Grade Intervention Group - Familiar Word Reading Frequency Distribution

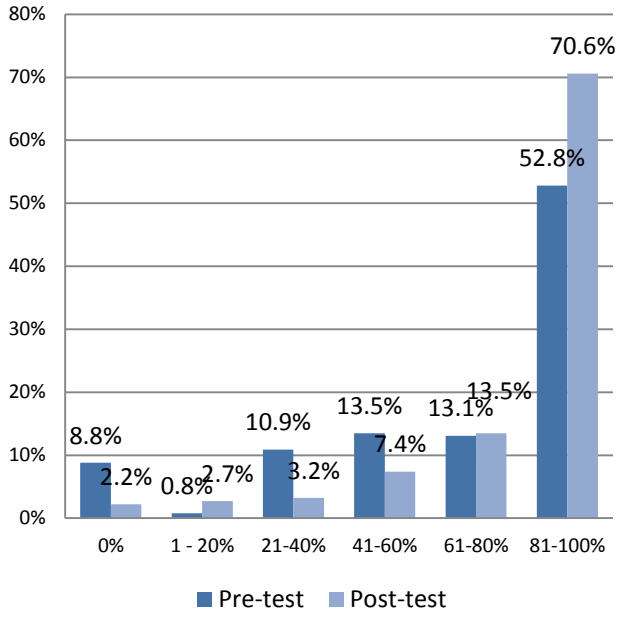


Figure 39. 3rd Grade Comparison Group - Familiar Word Reading Frequency Distribution

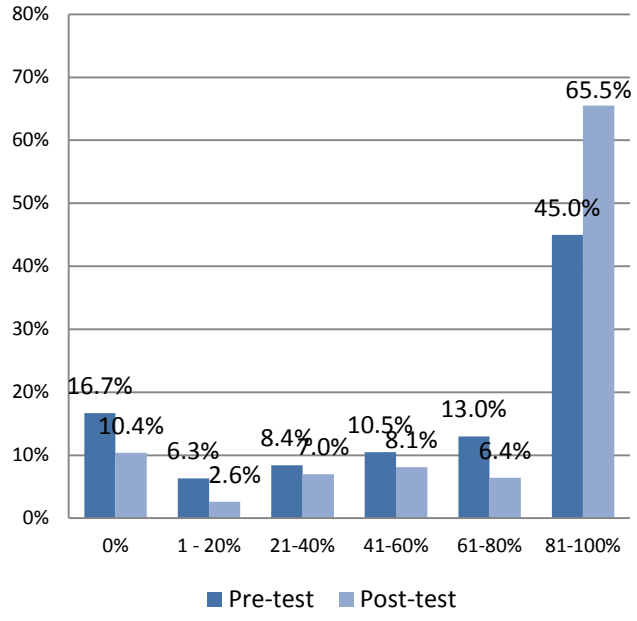


Figure 40. 3rd Grade Intervention Group - Invented Word Reading Frequency Distribution

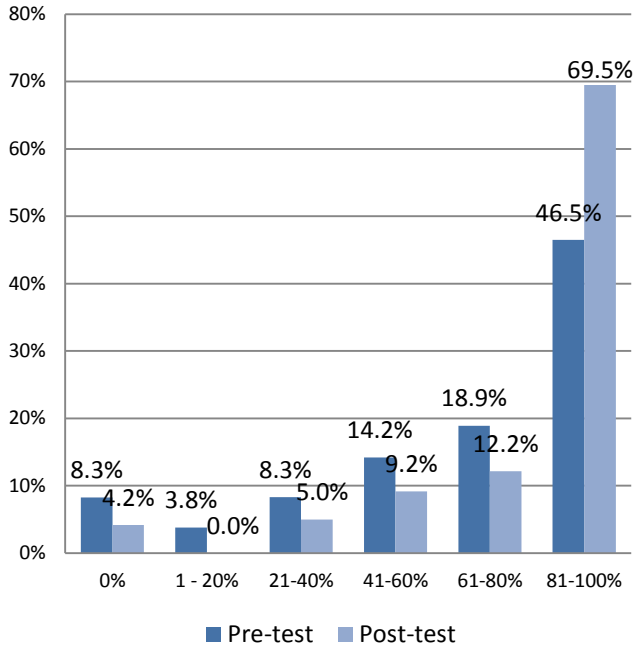


Figure 41. 3rd Grade Comparison Group - Invented Word Reading Frequency Distribution

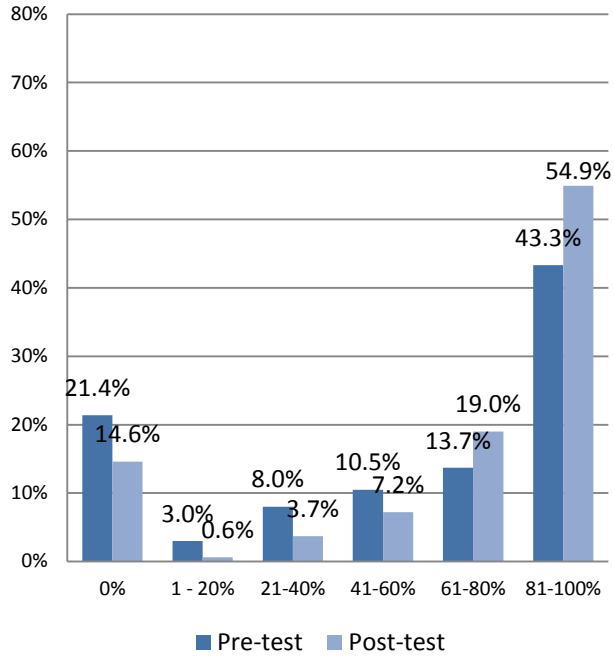


Figure 42. 3rd Grade Intervention Group – Oral Passage Reading Frequency Distribution

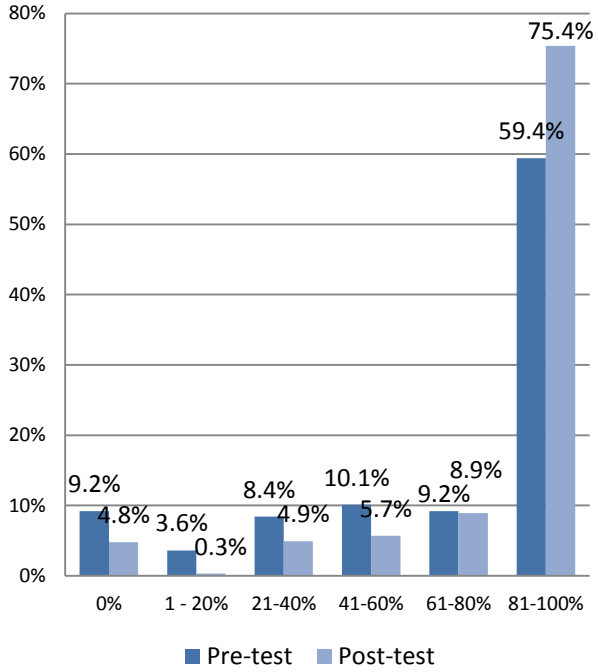
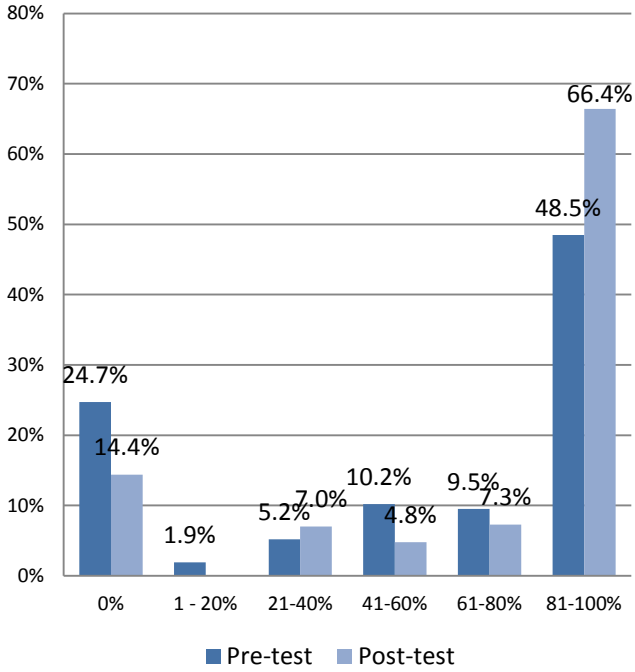


Figure 43. 3rd Grade Comparison Group – Oral Passage Reading Frequency Distribution



Grade 3 girls in WSRP schools demonstrated high overall performance, with an average posttest score of 90 percent subtest completion in reading familiar words, decoding invented words, and reading a connected text. By contrast, boys in the intervention group completed an average 80 percent in these subtests. Both girls and boys in the comparison group completed between with 70 to 80 percent of these subtests. Girls also demonstrated a higher speed of reading. Intervention group girls read over 70 words per minute, on average, for the connected text, decoded 55 familiar words per minute, and read 50 invented words per minute. Comparable average speeds for intervention group boys were 58, 47 and 42 words per minute, respectively.

Comparison group students read much more slowly. Girls read 57 words per minute from the connected text, and decoded familiar and invented words at 45 and 42 words per minute, respectively. Comparison group boys read a connected text at 51 words per minute, and decoded familiar and invented words at 42 and 37 words per minute, respectively.

Although girls in grade 3 outperformed boys on all subtests, boys in both WSRP and non-WSRP showed comparatively larger gains between tests. In particular, intervention group boys demonstrated significantly larger gains than girls in the completion of decoding familiar words subtest ($p<.001$), decoding invented words ($p<.05$), and both speed and completion of reading the connected text ($p<.001$). Comparison group boys showed larger gains than girls in both speed and completion of reading familiar words subtest ($p<.05$), in the speed of decoding invented words ($p<.05$), and in the speed of reading a connected text ($p<.01$).

Table 24. Results for EGRA fluency subtests, grade 3, by gender.

GRADE 3		GIRLS			BOYS		
		Pretest mean (St. Error)	Posttest mean (St. Error)	Gain score (St. Error)	Pretest mean (St. Error)	Posttest mean (St. Error)	Gain score (St. Error)
Familiar word reading (% correct; 50 words)	Intervention	79.7%‡ (1.217)	91.2% (0.935)	11.5% (0.961)	63.6% (1.457)	81.2% (1.193)	17.6% (1.07)
	Comparison	67% (1.899)	78.9% (1.713)	11.9% (1.021)	56.1% (2.04)	71.7% (1.903)	15.6% (1.334)
Familiar word reading (words per minute)	Intervention	48.3 (1.007)	55.2 (0.956)	6.8 (1.104)	38.1 (1.172)	47.1 (0.98)	9.0 (1.103)
	Comparison	38.4 (1.237)	45.0 (1.201)	6.6 (0.805)	32.3 (1.356)	42.8 (1.534)	10.5 (1.017)
Invented word reading (% correct; 50 words)	Intervention	77.2%‡ (1.261)	90.2% (0.955)	13% (0.807)	61.1% (1.36)	76.9% (1.189)	15.8% (0.776)
	Comparison	65.6% (1.91)	77.1% (1.718)	11.5% (0.962)	53.5% (2.146)	68.1% (2.003)	14.6% (1.435)
Invented word reading (words per minute)	Intervention	42 (0.81)	50.1 (0.691)	8.0 (0.713)	32.7 (0.815)	42.3 (0.874)	9.5 (0.635)
	Comparison	35 (1.089)	41.2 (1.015)	6.2 (0.636)	28.7 (1.231)	37.2 (1.231)	8.5 (0.869)
Oral passage reading (% correct; 61 words)	Intervention	82.5%‡ (1.283)	92% (0.892)	9.6% (0.808)	64.6%‡ (1.52)	79.9% (1.266)	15.3% (0.999)
	Comparison	66.6%	79.4%	12.8%*	55.9%	70.6%	14.7%

		(2.076)	(1.804)	(1.119)	(2.206)	(2.017)	(1.195)
Oral passage reading (words per minute)	Intervention	67.6 (1.478)	70.8 (1.271)	3.2 (1.371)	49.5 (1.45)	58 (1.231)	8.5 (1.121)
	Comparison	53.3 (1.926)	57.3 (1.647)	4 (1.249)	41.1 (1.891)	51 (1.845)	9.9 (1.083)

‡ The group's pretest mean score is statistically higher compared with the other group's score, at *p*<.01 level.
*The group's gain score is statistically significantly higher than the other group's at *p* <.05 level
**The group's gain score is statistically significantly higher than the other group's at *p* <.01 level
***The group's gain score is statistically significantly higher than the other group's at *p* <.001 level

For third graders, the highest error rate among the three fluency subtests at the posttest level was in the reading of familiar words (between 9 and 10 percent for the two groups), followed by decoding of invented words (around 8 percent), and oral reading (5 percent in both groups). Intervention and comparison groups showed an improvement between 1 and 2 percent in the percent of words read incorrectly between the pretest and the posttest. (See Annex F)

Grade three students' performance on fluency subtests (familiar word reading, invented word decoding, and oral passage reading) showed great similarity across the sexes. For both boys and girls, the highest error rate at the posttest level was in the reading of familiar words, followed by decoding of invented words, and oral reading. The rate of improvement between the pretest and the posttest was the highest among the intervention group girls (3.5 percent reduction in incorrect words in the oral reading passage).

To better understand student performance in these subtests, frequency distributions were grouped in quintiles and presented in Annex F.

Disaggregation by region showed that the intervention group in the ARMM scored significantly higher on the pretest than comparison group. The ARMM students also scored higher than Region 12 or Region 9 students Posttest results showed superior achievement by the Region 9 students who read on average 64 to 67 familiar words per minute, compared to 37 to 48 in the ARMM, and 35 to 44 in the Region 12.

Table 25. Overall results for EGRA subscales in ARMM, grade 3

		ARMM GRADE 3 STUDENTS		
		Pretest mean (St. Error)	Posttest mean (St. Error)	Gain score (St. Error)
Familiar word reading (% correct; 50 words)	Intervention	78.3%‡ (2.173)	89.3% (1.371)	11.1% (2.261)
	Comparison	50.4% (2.895)	73.8% (2.681)	23.4%*** (1.78)
Familiar word reading (per minute)	Intervention	53.5‡ (2.001)	44.7 (0.685)	-8.9 (1.911)
	Comparison	26.1 (1.56)	37.0 (1.351)	10.9 (0.996)
Invented word reading (% correct; 50 words)	Intervention	80.1%‡ (1.708)	90.9% (1.007)	10.8% (1.483)
	Comparison	46.8% (2.894)	68.3% (2.516)	21.5%*** (1.839)
Invented word reading (per minute)	Intervention	46.2‡ (1.34)	45.5 (0.503)	-0.8 (1.167)
	Comparison	23.7 (1.491)	34.2 (1.258)	10.4*** (0.954)

Oral passage reading (% correct; 61 words)	Intervention	81.6%‡ (2.144)	94.4% (1.046)	12.8% (1.961)
	Comparison	48.7% (3.037)	74.5% (2.765)	25.8*** (1.903)
Oral passage reading (words per minute)	Intervention	73.0‡ (2.703)	58.1 (0.671)	-14.9 (2.514)
	Comparison	30.2 (1.888)	45.4 (1.687)	15.3*** (1.183)

REGION 9 GRADE 3 STUDENTS

		Pretest mean (St. Error)	Posttest mean (St. Error)	Gain score (St. Error)
Familiar word reading (% correct; 50 words)	Intervention	78.5% (1.392)	89.7% (1.134)	11.2% (0.846)
	Comparison	78.6% (2.357)	88.7% (1.857)	10.1% (1.664)
Familiar word reading (per minute)	Intervention	44.5 (0.997)	64.1 (1.432)	19.7 (0.835)
	Comparison	49.1 (1.789)	67.9 (2.176)	18.9 (1.321)
Invented word reading (% correct; 50 words)	Intervention	74.1% (1.366)	88.9% (1.11)	14.8*** (0.822)
	Comparison	77.5% (2.343)	86.5% (1.798)	9% (1.58)
Invented word reading (per minute)	Intervention	39.7 (0.866)	55.6 (1.169)	15.9 ** (0.84)
	Comparison	42.6% (1.41)	54.4% (1.549)	11.8% (1.041)
Oral passage reading (% correct; 61 words)	Intervention	79.6% (1.49)	91.5% (1.107)	11.9% (0.921)
	Comparison	82.3% (2.257)	91% (1.744)	8.8% (1.72)
Oral passage reading (per minute)	Intervention	62.8 (1.661)	83.4 (1.694)	20.6 (0.967)
	Comparison	69.5 (2.555)	87.8 (2.514)	18.3 (1.614)

REGION 12 GRADE 3 STUDENTS

		Pretest mean (St. Error)	Posttest mean (St. Error)	Gain score (St. Error)
Familiar word reading (% correct; 50 words)	Intervention	63.3% (1.544)	81.9% (1.309)	18.6*** (1.055)
	Comparison	58.1% (1.957)	69.9% (1.883)	11.7% (1.09)
Familiar word reading (words per minute)	Intervention	37.5‡ (1.224)	44.5 (0.879)	7.0** (1.156)
	Comparison	32.5% (1.228)	35.1% (0.95)	2.6% (0.815)
Invented word reading (% correct; 50 words)	Intervention	60.3% (1.55)	76.1% (1.356)	15.8%** (0.826)
	Comparison	56.3% (2.045)	68% (2.013)	11.7% (1.157)
Invented word reading (words per minute)	Intervention	31.7 (0.868)	39.7 (0.776)	8.0*** (0.552)
	Comparison	30.1% (1.168)	34.1% (1.01)	3.9% (0.729)
Oral passage reading (% correct; 61 words)	Intervention	65%‡ (1.643)	78.1% (1.38)	13.1% (0.936)
	Comparison	56.4% (2.185)	67.9% (2.027)	11.5% (0.967)
Oral passage reading (words per minute)	Intervention	48.6 (1.471)	53.4 (1.202)	4.8*** (1.131)
	Comparison	43.5% (1.883)	41.6% (1.244)	-1.9% (1.1)

‡ The group's pretest mean score is statistically higher compared with the other group's score, at $p<.01$ level.

*The group's gain score is statistically significantly higher than the other group's at $p<.05$ level

**The group's gain score is statistically significantly higher than the other group's at $p<.01$ level

***The group's gain score is statistically significantly higher than the other group's at $p<.001$ level

COMPREHENSION AND WRITING SKILLS

Reading comprehension is a result of decoding skills, fluency in reading, and prior knowledge of vocabulary words. EGRA relies on two comprehension subtests to assess a student's comprehension skills: oral reading comprehension and listening comprehension. The oral reading comprehension subtest includes six questions administered at the conclusion of the oral reading passage that relate directly to the text read. The answers to each comprehension question are scored "correct" or "incorrect".

For the listening comprehension subtest, the test administrator reads a passage out loud to the student and then asks seven comprehension questions that directly relate to the text that the student just heard. While oral reading comprehension questions require a full range of skills (such as the ability to decode words, read fluently, and understand the meaning of words), the listening comprehension primary assesses the student's vocabulary.

In addition to the comprehension subtests, EGRA uses a dictation exercise to test students' writing skills. The dictation subtest was comprised of a sentence read to students by a test administrator and scored afterwards. Four words in the sentence were scored for spelling. The dictation composite included the following variables:

- Spelling of dictation words (correct spelling of a word = 2 points; partial correct spelling = 1 point; incorrect spelling = 0 points); up to 8 points total if the four scored words were spelled correctly
- Directions of the text (2 points)
- Spacing between words (2 points)
- Capitalization of the first word (2 points)
- Full stop at the end of the sentence (2 points)

The total maximum composite score was 16. For the distribution of frequencies the total composite was converted into percentage points and grouped into quintiles.

COMPREHENSION AND WRITING SKILLS: GRADE 2

Despite relatively high performance rates on the fluency subtests, the average comprehension rate of second grade students was very low. Intervention group students answered on average only one reading comprehension question at the posttest, while the comparison group answer rate was half of that. Results for listening comprehension were similar. Students performed best on dictation, with nearly half the words written correctly on average by the intervention group students at the posttest, and 30 percent of words written correctly by the comparison group students.

Intervention group students also showed a much larger gain between the pretest and the posttest for all three subtests. Consistent with the results from the other subtests, disaggregated analysis showed that

girls outperformed boys in all three subtests, both in the comparison group and in the intervention group.

Table 26. Overall results for EGRA subtests, grade 2

		ALL GRADE 2 STUDENTS		
		Pretest mean (St. Error)	Posttest mean (St. Error)	Gain score (St. Error)
Reading comprehension (% correct; 6 questions)	Intervention	9.5%‡ (0.66)	18.2% (0.88)	8.7%*** (0.689)
	Comparison	3.6% (0.437)	7.8% (0.555)	4.3% (0.479)
Listening comprehension (% correct; 5 questions)	Intervention	9.5%‡ (0.635)	18.9% (0.828)	9.4%*** (0.679)
	Comparison	4% (0.353)	6.7% (0.465)	2.7% (0.469)
Dictation (% correct; 16 points)	Intervention	25.9%‡ (0.809)	47% (1.005)	21.1%*** (0.809)
	Comparison	14.1% (0.641)	29.2% (0.891)	15.1% (0.639)

‡ The group's pretest mean score is statistically higher compared with the other group's score, at $p<.01$ level.
*The group's gain score is statistically significantly higher than the other group's at $p<.05$ level
**The group's gain score is statistically significantly higher than the other group's at $p<.01$ level
***The group's gain score is statistically significantly higher than the other group's at $p<.001$ level

Charts below illustrate frequency distributions of the comprehension subtests, presented as frequencies of actual number of comprehension questions answered correctly. Three-quarters of all intervention students and nearly 90 percent of all comparison students could not answer a single comprehension question after reading the text at the pretest. Although students in both groups did a little better at the posttest, only a handful of students were able to answer 5 or 6 comprehension questions.

The results for the listening comprehension were similar or worse than the result for the reading comprehension. No comparison group students were able to answer more than 3 comprehension questions after listening to a story that was read to them. Only a few students in the intervention group were able to answer more than 3 comprehension questions after listening to a story.

Figure 44. 2nd Grade Intervention Group - Reading Comprehension (6 Questions) Frequency Distribution

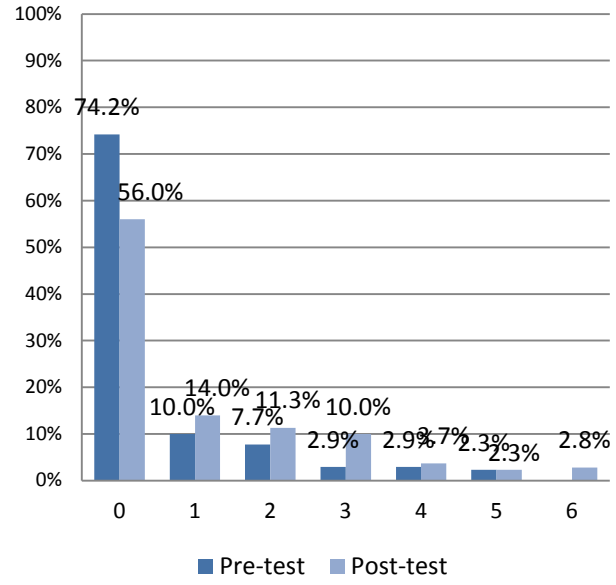


Figure 45. 2nd Grade Comparison Group - Reading Comprehension (6 Questions) Frequency Distribution

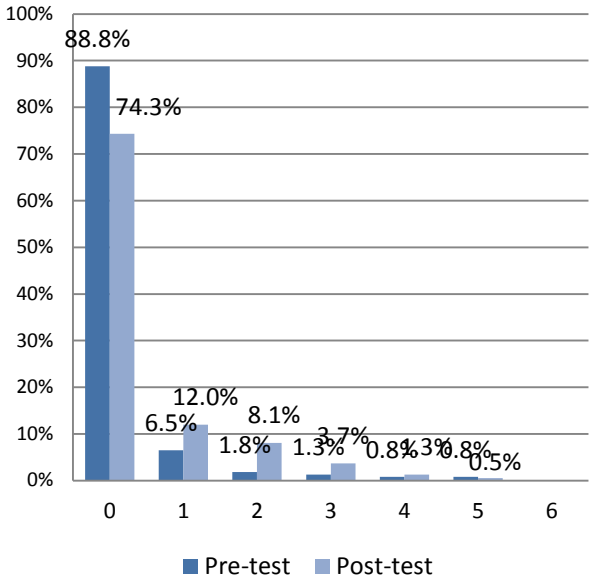


Figure 46. 2nd Grade Intervention Group - Listening Comprehension (7 Questions) Frequency Distribution

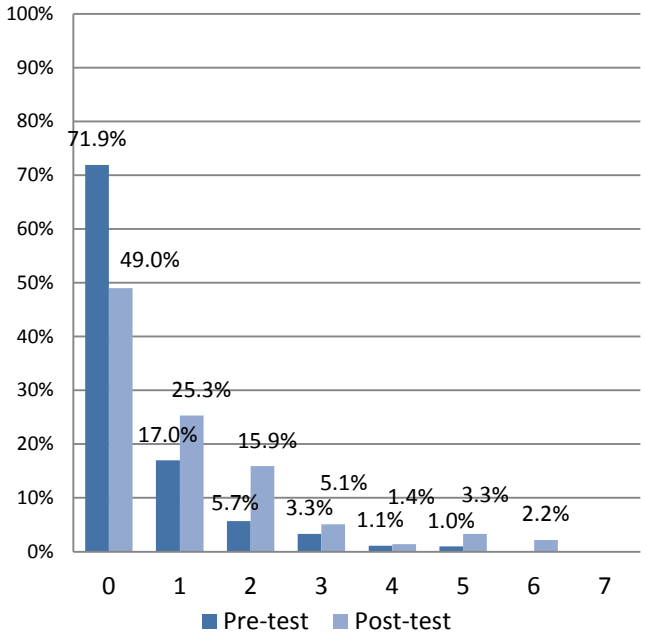
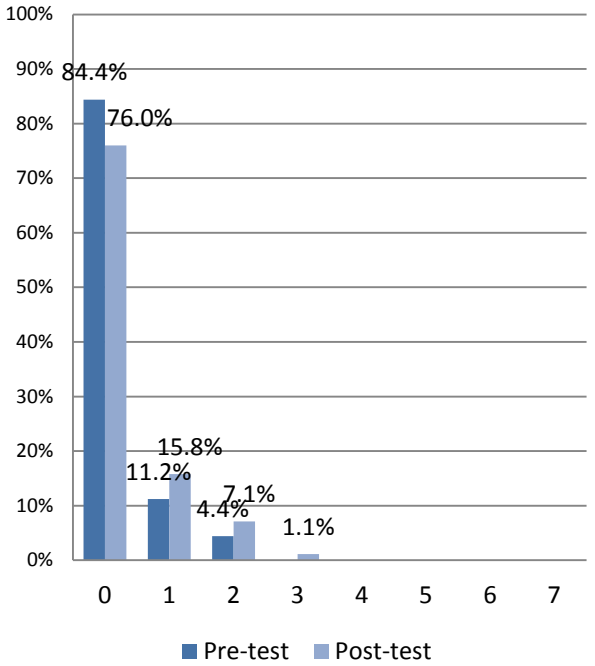


Figure 47. 2nd Grade Comparison Group - Listening Comprehension (7 Questions) Frequency Distribution



Charts below show distributions of the composite score for the dictation subtest, presented as quintiles. As the results of the analysis show, about half of the comparison students, and a third of intervention students scored zero at the pretest in the beginning of the second grade. By the end of the second grade, the distribution looked much more normal, with the majority of students scoring in the midrange. The intervention second graders gained significantly more on this subtest than the comparison second graders.

Figure 48. 2nd Grade Intervention Group -Dictation Frequency Distribution

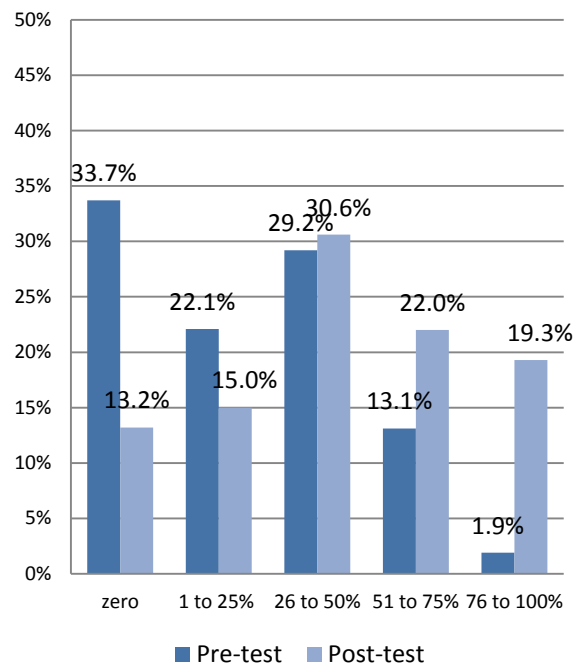
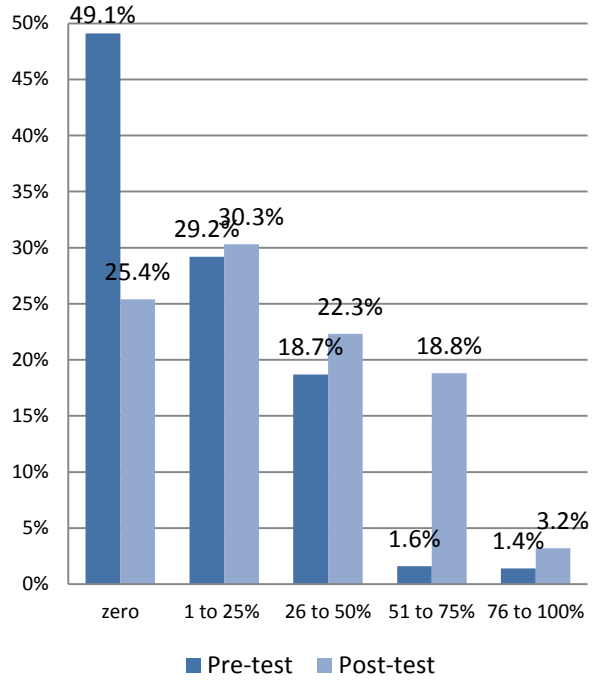


Figure 49. 2nd Grade Comparison Group -Dictation Frequency Distribution



The following charts compare the writing skills of intervention and comparison group students from grade 2. As can be seen, students in both groups improved between the pretest and the posttest in their use of spaces when writing, direction of text, and capitalization.

Out of four scored characteristics of writing, the students did best in the direction of writing, with over half of all students writing with the correct direction at the pretest, and over two-thirds writing correctly at the posttest. The intervention group students did better both at the pretest and the posttest than their comparison group counterparts. Twice as many students used spaces correctly at the posttest compared to the pretest in both groups.

Figure 50. Grade 2 Dictation Subtest: Use of Spaces

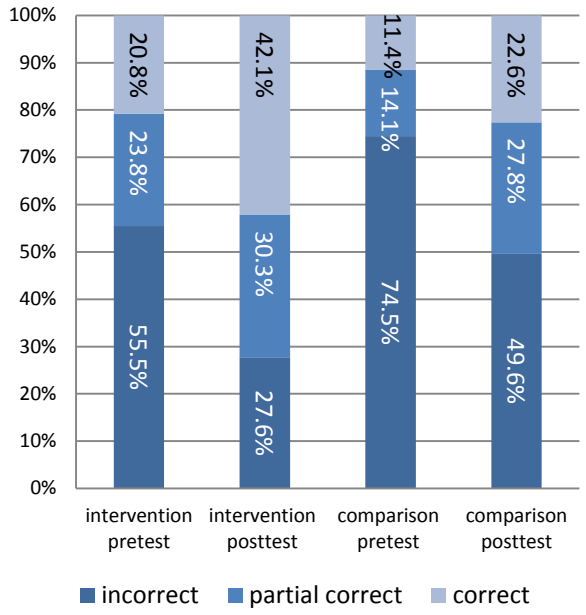
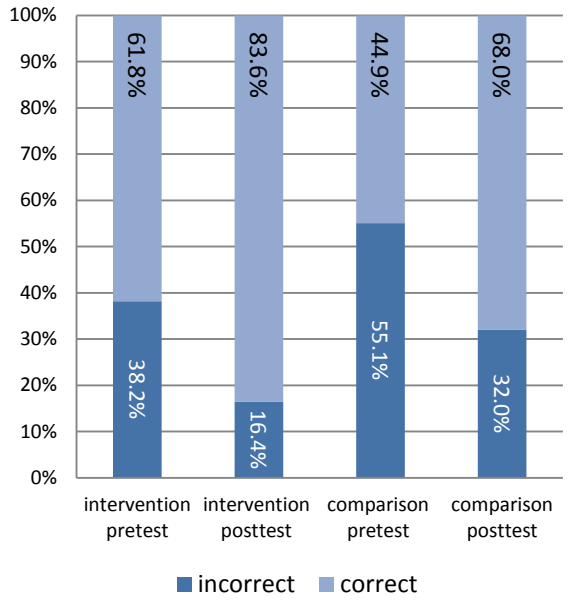


Figure 51. Grade 2 Dictation Subtest: Direction of Test



The majority of students in both groups did not use capitalization or full stops during the pretest and the posttest. Only the intervention group second graders improved with the use of the full stop at the end of the sentence; the comparison group results were unchanged in this subtest.

Figure 52. Grade 2 Dictation Subtest: Capitalization

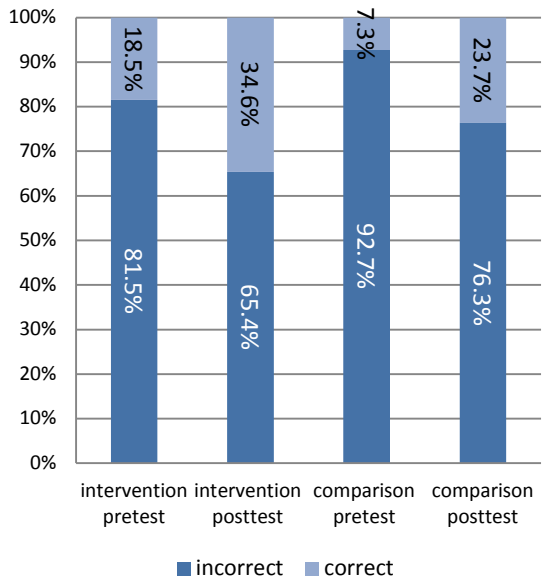
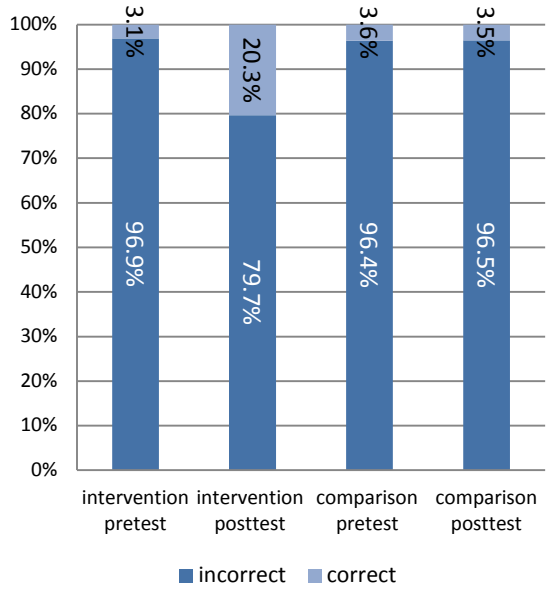


Figure 53. Grade 2 Dictation Subtest: Use of Full Stop



Gender comparisons of the comprehension subtest results showed that girls answered more questions correctly than boys, although the proportion of questions answered correctly was low for both groups. Both boys and girls in the intervention group gained more than boys and girls in the comparison group between the pretest and the posttest.

Table 27.Results for EGRA subtests, grade 2, by gender

GRADE 2		GIRLS			BOYS		
		Pretest mean (St. Error)	Posttest mean (St. Error)	Gain score (St. Error)	Pretest mean (St. Error)	Posttest mean (St. Error)	Gain score (St. Error)
Reading comprehension (% correct; 6 questions)	Intervention	13.9%‡ (1.111)	23.3% (1.376)	9.4%*** (1.129)	5.2%‡ (0.665)	13.3% (1.054)	8.1%*** (0.8)
	Comparison	5.6% (0.779)	9.9% (0.84)	4.3% (0.711)	1.3% (0.303)	5.6% (0.698)	4.2% (0.636)
Listening comprehension (% correct; 5 questions)	Intervention	11.4%‡ (1.005)	20.7% (1.217)	9.3%*** (1.03)	7.7%‡ (0.773)	17.2% (1.121)	9.5%*** (0.891)
	Comparison	4.8% (0.548)	7.8% (0.674)	2.9% (0.673)	3.1% (0.428)	5.5% (0.633)	2.4% (0.652)
Dictation (% correct; 16 points)	Intervention	29.2%‡ (1.196)	54.6% (1.434)	25.4%*** (1.253)	22.7%‡ (1.072)	39.7% (1.321)	17%** (0.991)
	Comparison	17.3% (0.982)	34.2% (1.251)	16.9% (0.853)	10.7% (0.772)	23.8% (1.211)	13.1% (0.949)

‡ The group's pretest mean score is statistically higher compared with the other group's score, at $p<.01$ level.
*The group's gain score is statistically significantly higher than the other group's at $p<.05$ level
**The group's gain score is statistically significantly higher than the other group's at $p<.01$ level
***The group's gain score is statistically significantly higher than the other group's at $p<.001$ level

To better understand student performance in these subtests, frequency distributions were grouped in quintiles and presented in Annex F.

When disaggregated by region, the data analysis shows similarly low comprehension scores across all three regions. Although students in all three regions demonstrated some gains in reading and listening comprehension, their gains in dictation composite score was the largest, particularly in the ARMM.

Table 28. Overall results for EGRA subscales in ARMM, grade 2

		ARMM GRADE 2 STUDENTS		
		Pretest mean (St. Error)	Posttest mean (St. Error)	Gain score (St. Error)
Reading comprehension (% correct; 6 questions)	Intervention	7.7% (1.486)	12.2% (1.408)	4.5% (1.515)
	Comparison	9.7% (1.597)	14% (1.562)	4.3% (1.148)
Listening comprehension (% correct; 5 questions)	Intervention	9.1%‡ (1.206)	27.6% (1.693)	18.5*** (2.126)
	Comparison	3.5% (0.731)	7.3% (0.964)	3.8% (0.676)

Dictation (% correct; 16 points)	Intervention	29.1% (1.791)	72.2% (2.043)	43.1%*** (2.261)
	Comparison	27.4% (1.784)	41.7% (2.018)	14.3% (1.279)

REGION 9 GRADE 2 STUDENTS

		Pretest mean (St. Error)	Posttest mean (St. Error)	Gain score (St. Error)
Reading comprehension (% correct; 6 questions)	Intervention	12.6%‡ (1.269)	25.6% (1.823)	13%*** (1.494)
	Comparison	3% (0.685)	6.2% (0.916)	3.2% (0.872)
Listening comprehension (% correct; 5 questions)	Intervention	14.1%‡ (1.383)	20.4% (1.596)	6.3%*** (1.04)
	Comparison	7% (0.87)	4.8% (0.715)	-2.2% (1.091)
Dictation (% correct; 16 points)	Intervention	25.7%‡ (1.533)	39.9% (1.733)	14.2% (1.146)
	Comparison	9.5% (0.97)	27.1% (1.575)	17.6% (1.32)

REGION 12 GRADE 2 STUDENTS

		Pretest mean (St. Error)	Posttest mean (St. Error)	Gain score (St. Error)
Reading comprehension (% correct; 6 questions)	Intervention	8.3%‡ (0.887)	15.8% (1.168)	7.5%* (0.822)
	Comparison	1.4% (0.333)	6.2% (0.685)	4.8% (0.655)
Listening comprehension (% correct; 5 questions)	Intervention	6.9%‡ (0.782)	15.2% (1.115)	8.3%** (0.875)
	Comparison	2.6% (0.39)	7.4% (0.714)	4.8% (0.617)
Dictation (% correct; 16 points)	Intervention	25%‡ (1.113)	43% (1.294)	18%* (0.989)
	Comparison	11.1% (0.728)	25.2% (1.19)	14.1% (0.875)

‡ The group's pretest mean score is statistically higher compared with the other group's score, at $p<.01$ level.

*The group's gain score is statistically significantly higher than the other group's at $p<.05$ level

**The group's gain score is statistically significantly higher than the other group's at $p<.01$ level

***The group's gain score is statistically significantly higher than the other group's at $p<.001$ level

COMPREHENSION AND WRITING SKILLS: GRADE 3

Like their second grade counterparts, third graders demonstrated low reading comprehension despite exhibiting high fluency rates. Both intervention and comparison group students answered on average between one and two reading comprehension question at the posttest. Comparison group students doubled their reading comprehension scores between the pretest and the posttest, which was significantly higher than about 50% improvement recorded for the intervention group students. The rate of answering listening comprehension questions correctly was even lower, and the rate of change between the pretest and the posttest was about the same for both groups.

The dictation results were the best, with an average of almost half of words written correctly by the intervention group students at the posttest, and 30 percent of words written correctly by the comparison group students.

Intervention group students showed a much larger gain between the pretest and the posttest for all three subtests. Consistent with the results from the other subtests, disaggregated analysis showed that girls outperformed boys in all three subtests, both in the comparison group and in the intervention group.

Table 29. Results for EGRA comprehension and writing subtests, grade 3

		GRADE 3 STUDENTS		
		Pretest mean (St. Error)	Posttest mean (St. Error)	Gain score (St. Error)
Reading comprehension (% correct; 6 questions)	Intervention	17.9% (0.776)	25.2% (0.858)	7.3% (0.654)
	Comparison	12.3% (0.851)	24.5% (1.086)	12.1%*** (0.808)
Listening comprehension (% correct; 5 questions)	Intervention	12.4% (0.576)	19% (0.77)	6.7% (0.609)
	Comparison	9.3% (0.625)	15.9% (0.862)	6.5% (0.626)
Dictation (% correct; 16 points)	Intervention	38.3% (0.836)	57.5% (0.801)	19.2% (0.607)
	Comparison	30.1% (1.004)	47.7% (1.103)	17.6% (0.731)

‡ The group's pretest mean score is statistically higher compared with the other group's score, at $p<.01$ level.
*The group's gain score is statistically significantly higher than the other group's at $p<.05$ level
**The group's gain score is statistically significantly higher than the other group's at $p<.01$ level
***The group's gain score is statistically significantly higher than the other group's at $p<.001$ level

Charts below illustrate frequency distributions of the comprehension and writing subtests, presented as quintiles. The distributions show that at the beginning of the third grade the majority of students could not answer a single comprehension question about the short passage they just read. At the posttest at the end of the third grade almost half of students in both groups still could not answer a single comprehension question. About one in four students in both WSRP and non-WSPR schools could answer three or more comprehension questions at the posttest.

Figure 54. 3rd Grade Intervention Group - Reading Comprehension (6 Questions) Frequency Distribution

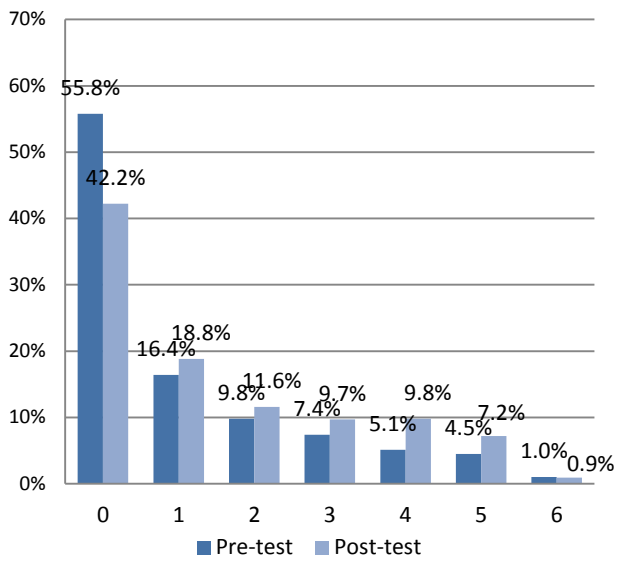
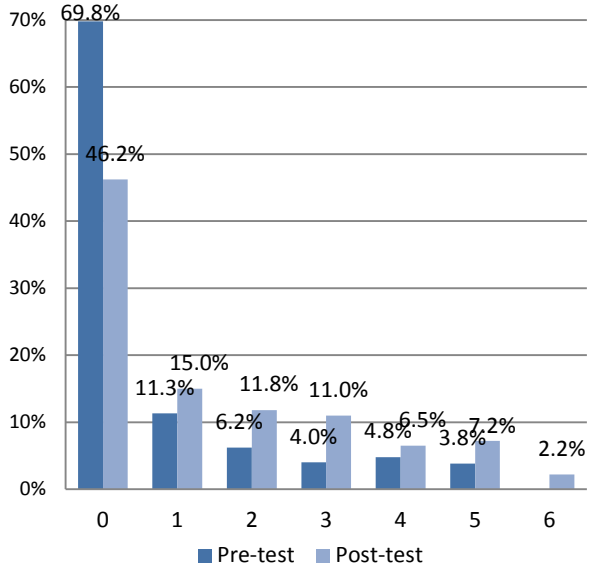


Figure 55. 3rd Grade Comparison Group - Reading Comprehension (6 Questions) Frequency Distribution



The results were listening comprehension were lower than for the reading comprehension. Over 50 percent of third graders in both groups could not answer even one comprehension question at the posttest. Only a handful of students answered between 3 and 5 listening comprehension questions, and no students answered 6 or 7 questions.

Figure 56. 3rd Grade Intervention Group - Listening Comprehension (6 Questions) Frequency Distribution

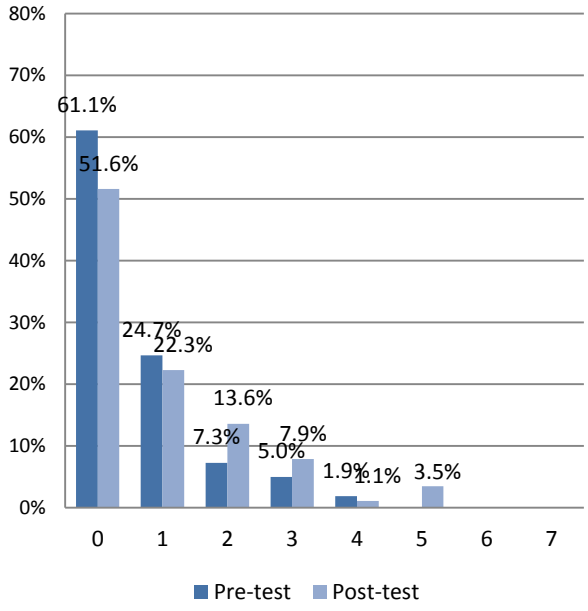
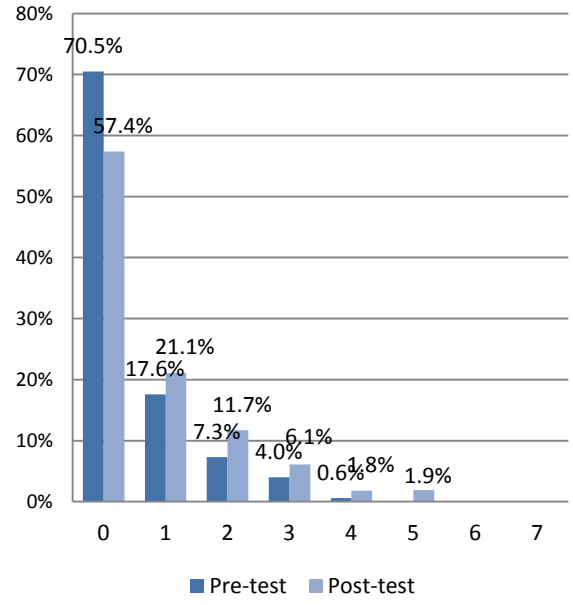


Figure 57. 3rd Grade Comparison Group - Listening Comprehension (6 Questions) Frequency Distribution



Finally, the results for the dictation subtest showed significant improvements between the pretest and the posttest, although the WSRP third graders gained more. Over 55 percent of WSRP students scored over 50 percent at the posttest, compared with 43.3 percent of non-WSRP students.

Figure 58. 3rd Grade Intervention Group – Dictation Frequency Distribution

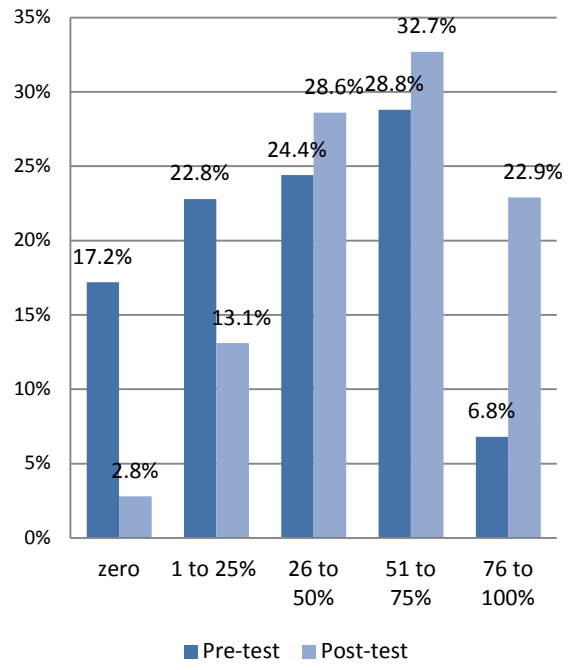
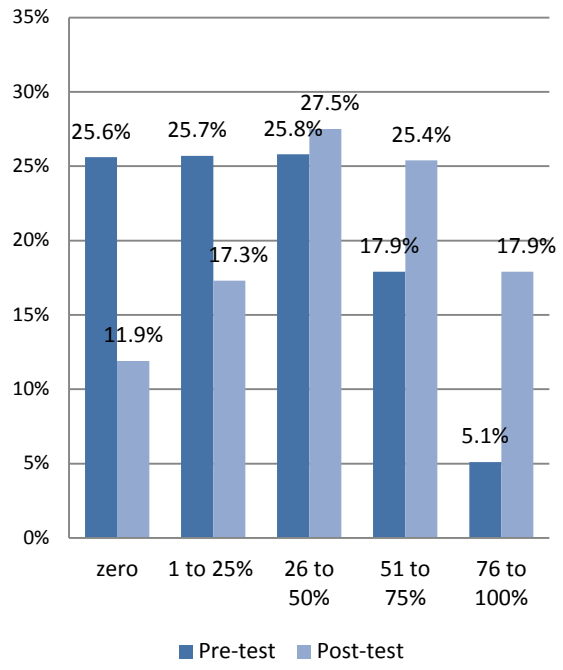


Figure 59. 3rd Grade Comparison Group – Dictation Frequency Distribution



The following charts compare the writing skills of intervention and comparison group students from grade 3. Although both intervention and comparison group students improved between the pretest and the posttest, the majority of students in both groups did not use capitalization and full stops correctly. Just over 20 percent of the intervention group students and 16 percent of the comparison group students used capitalization correctly at the posttest.

Similarly to the second graders, the third graders did better with the use of spaces and the direction of writing: over 90 percent of intervention group students, and 80 percent of the comparison group students, wrote with the correct direction at the posttest, and also used spaces when writing.

Figure 60. Grade 3 Dictation Subtest: Use of Spaces

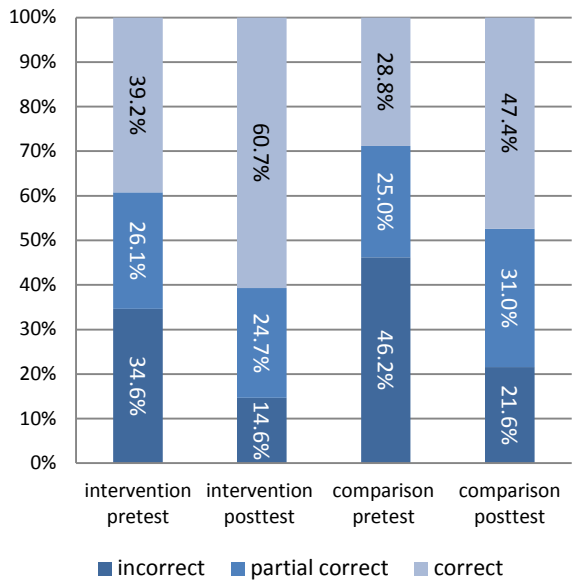


Figure 61. Grade 3 Dictation Subtest: Direction of Test

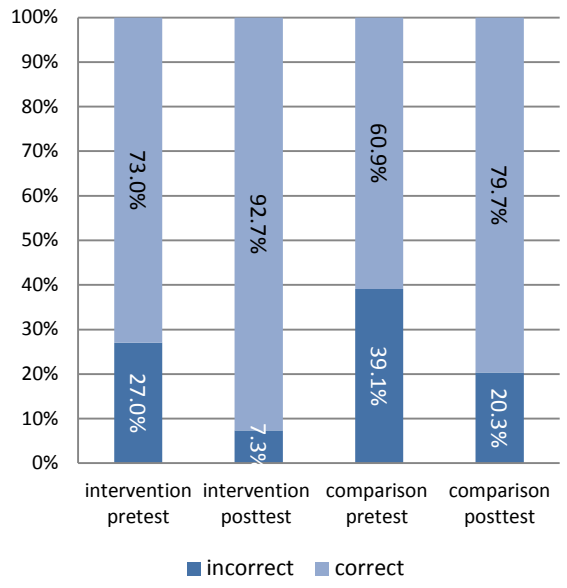


Figure 62. Grade 3 Dictation Subtest: Capitalization

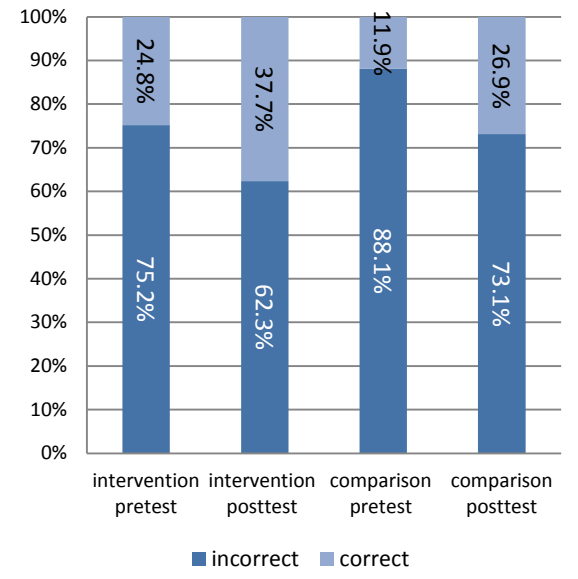
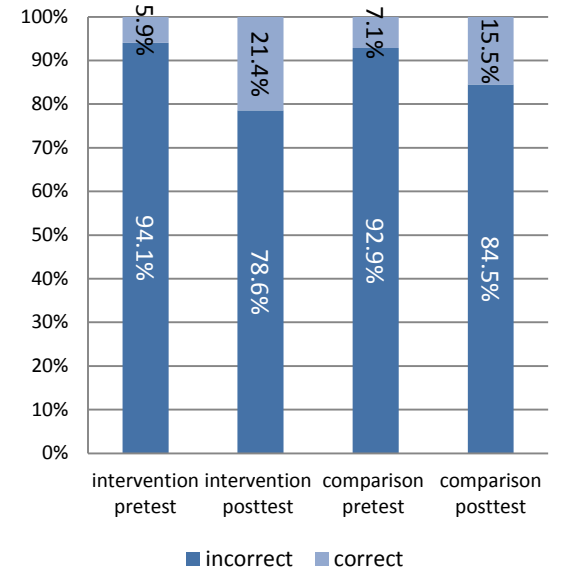


Figure 63. Grade 3 Dictation Subtest: Use of Full Stop



Gender comparisons showed that as with other subtests, third grade girls performed much better than boys, and they also showed larger gains between the pretest and the posttest. Comparison group girls gained more than intervention group girls on the reading comprehension subtest (*p*<.001), while intervention group boys gained more than their comparison group counterparts on the dictation subtest (*p*<.001).

Table 30. Results for EGRA comprehension and writing subtests, grade 3, by gender.

GRADE 3		GIRLS			BOYS		
		Pretest mean (St. Error)	Posttest mean (St. Error)	Gain score (St. Error)	Pretest mean (St. Error)	Posttest mean (St. Error)	Gain score (St. Error)
Reading comprehension (% correct; 6 questions)	Intervention	23.7% (1.252)	31.7% (1.242)	8.1% (1.059)	12.9% (0.916)	19.6% (1.138)	6.7% (0.807)
	Comparison	14.1% (1.235)	30.7% (1.604)	16.6%*** (1.176)	10.3% (1.152)	17.5% (1.348)	7.2% (1.033)
Listening comprehension (% correct; 5 questions)	Intervention	14.8% (0.959)	23.2% (1.278)	8.4% (1.054)	10.3% (0.675)	15.5% (0.897)	5.2% (0.678)
	Comparison	9.4% (0.898)	17.7% (1.24)	8.2% (0.944)	9.2% (0.864)	13.9% (1.181)	4.6% (0.793)
Dictation (% correct; 16 points)	Intervention	47.1% (1.167)	64.7% (1.201)	17.5% (0.823)	30.8% (1.097)	51.4% (1.01)	20.6%*** (0.876)
	Comparison	31.7% (1.39)	51.8% (1.468)	20.1% (1.092)	28.2% (1.449)	43.1% (1.628)	14.8% (0.933)

‡ The group's pretest mean score is statistically higher compared with the other group's score, at *p*<.01 level.
*The group's gain score is statistically significantly higher than the other group's at *p* <.05 level
**The group's gain score is statistically significantly higher than the other group's at *p* <.01 level
***The group's gain score is statistically significantly higher than the other group's at *p* <.001 level

To better understand student performance in these subtests, frequency distributions were grouped in quintiles and presented in Annex F.

Disaggregation by region showed that at the pretest the intervention group in the ARMM scored significantly higher than the comparison group in the same region. These third graders also showed the highest overall performance at the pretest and the posttest, and they gained more on two out of three subtests than their peers from other regions.

Table 31. Overall results for EGRA subscales in ARMM, grade 3

		ARMM GRADE 3 STUDENTS		
		Pretest mean (St. Error)	Posttest mean (St. Error)	Gain score (St. Error)
Reading comprehension (% correct; 6 questions)	Intervention	31.6%‡ (2.271)	29.2% (2.018)	-2.4% (1.423)
	Comparison	1.9% (0.744)	9.2% (1.594)	7.4%*** (1.476)

Listening comprehension (% correct; 5 questions)	Intervention	27.7%‡ (1.709)	38.7% (2.411)	11%*** (1.598)
	Comparison	1% (0.361)	1.9% (0.482)	0.9% (0.536)
Dictation (% correct; 16 points)	Intervention	50.2%‡ (2.06)	73.8% (1.881)	23.6*** (1.353)
	Comparison	24.1% (1.797)	37% (1.98)	12.8% (1.583)

REGION 9 GRADE 3 STUDENTS

		Pretest mean (St. Error)	Posttest mean (St. Error)	Gain score (St. Error)
Reading comprehension (% correct; 6 questions)	Intervention	21.6% (1.387)	32.7% (1.636)	11.1% (1.258)
	Comparison	23.3% (2.216)	38.1% (2.101)	14.8% (1.864)
Listening comprehension (% correct; 5 questions)	Intervention	12% (0.89)	14% (1.134)	2% (1.244)
	Comparison	15.9% (1.472)	21.5% (1.596)	5.7% (1.466)
Dictation (% correct; 16 points)	Intervention	42.5% (1.343)	60.2% (1.212)	17.7% (1.073)
	Comparison	38.9% (1.931)	58.6% (1.749)	19.7% (1.491)

ALL GRADE 3 STUDENTS

		Pretest mean (St. Error)	Posttest mean (St. Error)	Gain score (St. Error)
Reading comprehension (% correct; 6 questions)	Intervention	10.1% (0.802)	18.7% (1.077)	8.7% (0.845)
	Comparison	11% (1.016)	23.6% (1.495)	12.7%** (1.055)
Listening comprehension (% correct; 5 questions)	Intervention	6.6% (0.61)	14.6% (0.836)	8% (0.678)
	Comparison	9.3%‡ (0.841)	18.4% (1.301)	9% (0.876)
Dictation (% correct; 16 points)	Intervention	30.9% (1.132)	49.4% (1.093)	18.5% (0.869)
	Comparison	28% (1.422)	46.4% (1.633)	18.4% (0.976)

‡ The group's pretest mean score is statistically higher compared with the other group's score, at $p<.01$ level.

*The group's gain score is statistically significantly higher than the other group's at $p<.05$ level

**The group's gain score is statistically significantly higher than the other group's at $p<.01$ level

***The group's gain score is statistically significantly higher than the other group's at $p<.001$ level

EGRA RELIABILITY ANALYSIS

The following subtests were included in the EGRA reliability analysis:

- Pre-literacy skills
  - Letter naming (percent correct)
  - Letter sounds (percent correct)
  - Initial sound identification (percent correct)
- Fluency skills
  - Familiar word reading (correct words per minute)
  - Invented word reading (correct words per minute)
  - Oral reading passage(correct words per minute)
- Comprehension skills
  - Oral reading comprehension
  - Listening comprehension

Reliability analysis results showed strong internal reliability, with Chronbach's alpha ranging from .859 to .963. The table below reports the results of the analysis.

Table 32.Reliability analysis for the pre-literacy skills subtests

	Item Correlation	Chronbach's Alpha if item deleted
Letter naming	.751	.809
Letter sounds	.803	.811
Initial sound identification	.761	.820
Chronbach's alpha	.867	

Table 33. Reliability analysis for the fluency skills subtests

	Item Correlation	Chronbach's Alpha if item deleted
Familiar word reading	.979	.909
Invented word decoding	.948	.965
Oral passage reading	.976	.962
Chronbach's alpha	.963	

Table 34. Reliability analysis for the comprehension skills subtests

	Item Correlation
Reading comprehension	.770
Listening comprehension	.770
Chronbach's alpha	.859

Principal component analysis extracted only one factor with eigenvalues more than 1 and explaining 73.7% of variance.

TEACHER OBSERVATION FINDINGS

The SCOPE Literacy is based on the original Standards-Based Classroom Observation Protocol for Educators[13] that includes sixteen dimensions, or areas of instructional practices. For this study, it was modified to focus on five dimensions that DepEd administrators and project staff were most interested in observing in WSRP classrooms:

1. Provides students with structured opportunities to develop their encoding (spelling/writing) and decoding skills
2. Provides students with structured opportunities to increase their vocabulary in order to improve their reading comprehension and writing skills
3. Uses diverse instructional strategies to develop students' reading fluency
4. Uses diverse instructional strategies to develop students' comprehension skills
5. Implements instruction that recognizes the importance of independent, original writing in the development of reading skills

Teacher training under the Whole School Reading Program aimed to address these five dimensions of teacher classroom practice. Observations of intervention and comparison group teachers conducted by trained observers before the training and at the end of the project attempted to capture whether or not the training resulted in an observable change at the classroom practice level.

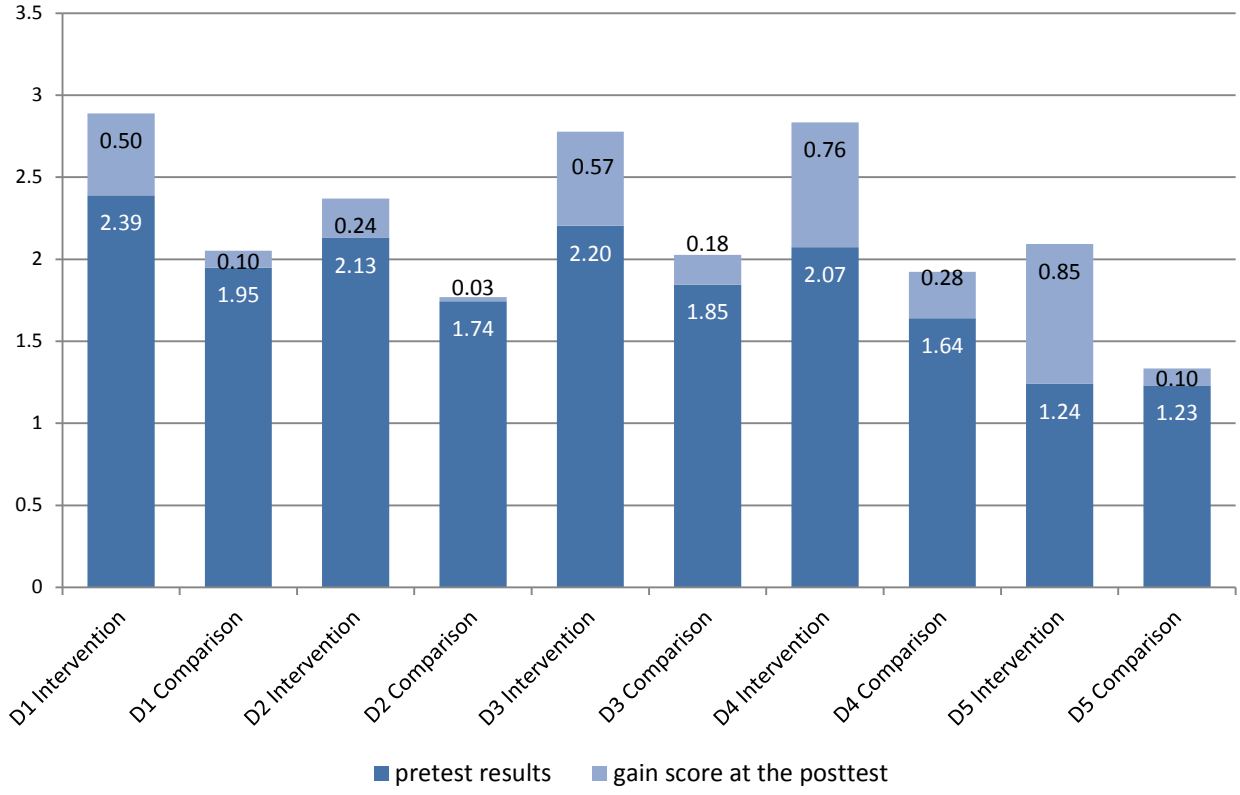
SUMMARY OF THE OBSERVATION RESULTS

The data analysis of the observation data focused on comparing the change in SCOPE Literacy scores between the pretest and the posttest, and between the intervention teachers and the comparison group teachers. If the training was effective in promoting a positive change in the teacher instructional practice, then the analysis will reveal higher gains for the intervention group teachers than for the comparison group teachers.

The chart below shows the results of the descriptive data analysis. Intervention group teachers scored higher on four out of five SCOPE Literacy dimensions at the pretest, and higher on all five SCOPE Literacy dimensions at the posttest. As the chart demonstrates, both intervention and comparison group teachers scored highest on the first dimension of SCOPE Literacy ("Provides students with structured opportunities to develop their encoding (spelling/writing) and decoding skills"), followed by the second, third and fourth dimensions. Both groups of teachers scored the lowest on the fifth dimension of SCOPE Literacy ("Implements instruction that recognizes the importance of independent, original writing in the development of reading skills"), although intervention group teachers demonstrated the highest gains in this dimension between the pretest and the posttest.

[13] SCOPE was developed by EDC and successfully used in many EDC projects around the world.

Figure 64. Mean gains in SCOPE Literacy scores between pretest and posttest, by dimension



The comparison of means (independent group t-test) showed a larger than average gain in all five SCOPE Literacy dimensions among teachers in the intervention group (p<.01). The analysis by dimension showed larger improvement among intervention group teachers in three out of five SCOPE dimensions:

- Use diverse instructional strategies to develop students' reading fluency (t = 2.10; p<.05)
- Use diverse instructional strategies to develop students' comprehension skills (t = 2.71; p<.01)
- Implement instruction that recognizes the importance of independent, original writing in the development of reading skills (t = 4.70; p<.001)

Results of linear regression analysis showed that the project was effective in improving overall SCOPE score of teachers in both grades. For the second grade teachers, participation in the WSRP program was associated with an increase in the overall SCOPE score by 2.12 points (significant at p<.05 level). For the third grade teachers, participation in the WSRP program was associated with an increase in the overall

SCOPE score by 2.32 points (significant at $p<.01$ level). The associated r-squared was found to be .135 for the second grade teachers, and .139 for the third grade teachers[14].

These results demonstrate an overall greater improvement in their mastery of techniques by the intervention group teachers who received WSRP training. The table below presents the pre and post-test mean scores for both the intervention and control groups, out of the total possible score of 5.

Table 35. Pretest and posttest teacher observation results

		SCOPE mean results		
SCOPE dimensions		Pretest mean (St. Deviation)	Posttest mean (St. Deviation)	Gain score (St. Deviation)
1. Provides students with structured opportunities to develop their encoding (spelling/writing) and decoding skills	Intervention	2.4‡ (0.878)	2.9 (0.744)	0.5 (1.023)
	Comparison	1.9 (0.887)	2.1 (0.826)	0.1 (1.119)
2. Provides students with structured opportunities to increase their vocabulary in order to improve their reading comprehension and writing skills	Intervention	2.1‡ (0.728)	2.4 (0.592)	0.2 (0.725)
	Comparison	1.7 (0.637)	1.8 (0.583)	0 (0.628)
3. Uses diverse instructional strategies to develop students' reading fluency	Intervention	2.2‡ (0.762)	2.8 (0.718)	0.6* (0.944)
	Comparison	1.8 (0.779)	2 (0.707)	0.2 (0.823)
4. Uses diverse instructional strategies to develop students' comprehension skills	Intervention	2.1‡ (0.723)	2.8 (0.666)	0.8** (0.867)
	Comparison	1.6 (0.707)	1.9 (0.774)	0.3 (0.793)
5. Implements instruction that recognizes the importance of independent, original writing in the development of reading skills	Intervention	1.2 (0.473)	2.1 (0.68)	0.9*** (0.763)
	Comparison	1.2 (0.485)	1.3 (0.621)	0.1 (0.754)
Average percent	Intervention	2.001	2.593	.585**
	Comparison	1.682	1.821	.129

‡ The group's pretest mean score is statistically higher compared with the other group's score, at $p<.01$ level.
*The group's gain score is statistically significantly higher than the other group's at $p<.05$ level
**The group's gain score is statistically significantly higher than the other group's at $p<.01$ level
***The group's gain score is statistically significantly higher than the other group's at $p<.001$ level

DIMENSION-LEVEL DESCRIPTIVE ANALYSIS RESULTS

SCOPE LITERACY DIMENSION 1: ENCODING AND DECODING

[14] Complete results of the regression analysis are found in Annex E.

The following charts show distributions of frequencies in SCOPE Literacy scores, by each of the five dimensions. The lowest score was 1 and the highest score was 5. The SCOPE Literacy dimension 1 focused on providing students with structured opportunities to develop their encoding (spelling/writing) and decoding skills, and included the following characterization of the scoring scale:

Score 1: Students have no opportunities to develop or apply basic encoding and decoding skills

Score 2: Students rarely have opportunities to develop and apply a limited range of basic encoding and decoding skills, and activities are inappropriate or repetitive

Score 3: Students have occasional opportunities to develop and apply encoding and decoding skills, and activities are appropriate

Score 4: Students have frequent opportunities to develop and apply a variety of encoding and decoding skills using a range of appropriate activities

Score 5: Students consistently have opportunities to develop and apply a broad range of encoding and decoding skills in creative and interesting ways

The charts below show distributions of pretest and posttest frequencies on the SCOPE Literacy Dimension 1 ("Provides students with structured opportunities to develop their encoding (spelling/writing) and decoding skills"). As the charts show, while the proportion of respondents from the WSRP who received a score of 3 and 4 on Dimension 1 increased 18.5 and 9.3 percentage points, respectively, the corresponding changes for the non-WSRP group were 7.7 and -2.5 points, respectively (the latter signifying that the proportion of non-WSRP respondents with a score of 4 actually went down).

Figure 65. SCOPE Literacy Dimension 1 Pretest

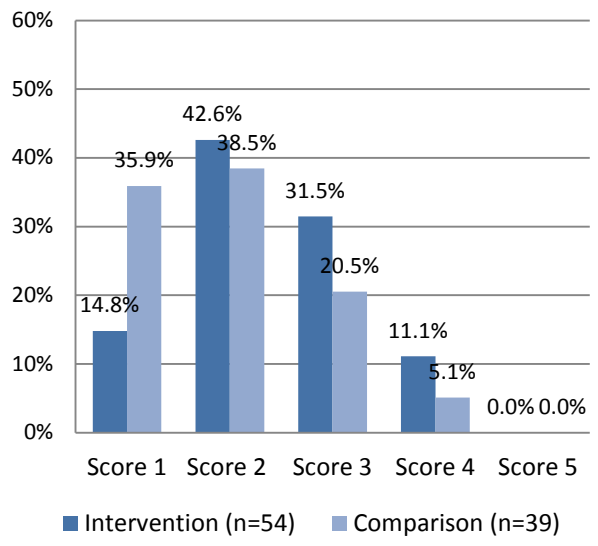
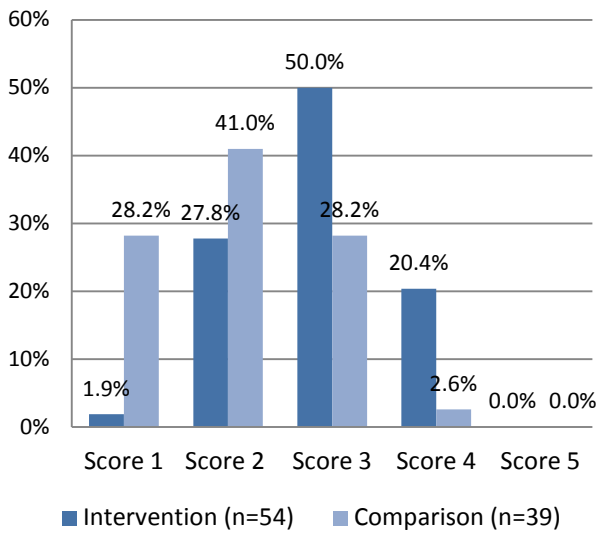


Figure 66. SCOPE Literacy Dimension 1 Posttest



SCOPE LITERACY DIMENSION 2: VOCABULARY

The SCOPE Literacy dimension 2 focused on providing students with structured opportunities to increase their vocabulary in order to improve their reading comprehension and writing skills, and included the following characterization of the scoring scale:

Score 1: Students are not provided with opportunities to develop their vocabulary

Score 2: Students are provided with limited structured opportunities to develop their vocabulary through direct instruction that focuses on verbal definitions

Score 3: Students are provided with occasional opportunities to develop their vocabulary through direct and indirect instruction

Score 4: Students are provided with frequent opportunities to develop their vocabulary through direct and indirect instruction

Score 5: Students are provided with consistent opportunities to develop their vocabulary through an effective blend of direct and indirect instruction

The charts below show distributions of pretest and posttest frequencies on the SCOPE Literacy Dimension 2 ("Provides students with structured opportunities to increase their vocabulary in order to improve their reading comprehension and writing skills"). The comparison of pretest-posttest results showed that the proportion of WSRP respondents with a score of 1 went down nearly 17 percentage points (from 18.5 percent to 1.9 percent), with corresponding movement into the upper score categories, particularly for Score 2, which increased 11 percentage points. For non-WSRP respondents, the corresponding change in Scores 1 and 2 was a decrease of only 5 percentage points and an increase of only 7 percentage points.

Figure 67. SCOPE Literacy Dimension 2 Pretest

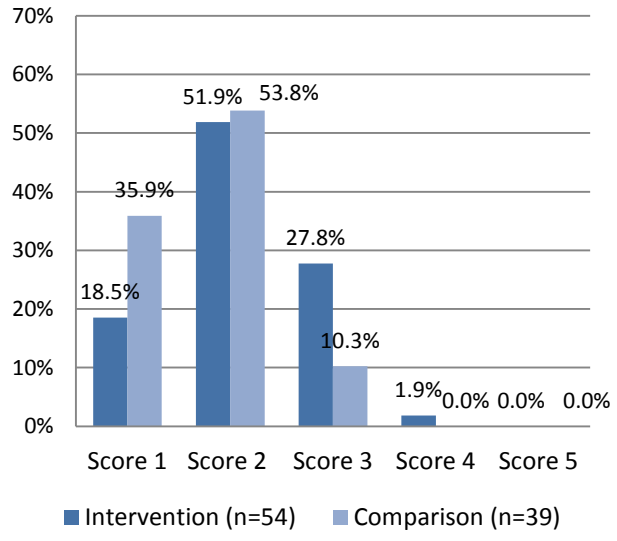
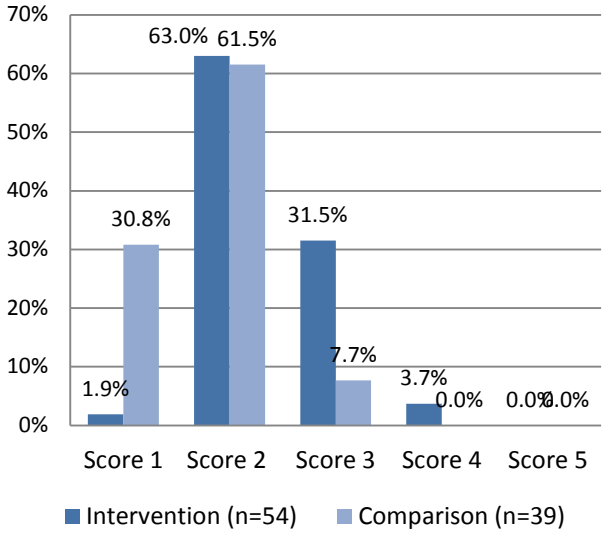


Figure 68. SCOPE Literacy Dimension 2 Posttest



SCOPE LITERACY DIMENSION 3: READING FLUENCY

The SCOPE Literacy dimension 3 focused on using diverse instructional strategies to develop students' reading fluency, and included the following characterization of the scoring scale:

Score 1: The teacher stresses recitation and memorization. Strategies to develop fluency are not manifested

Score 2: The teacher ensures students can automatically recognize words before having them read for fluency. Strategies are limited to modeling or repetition

Score 3: The teacher ensures that student can automatically recognize words in text and understand them before having them read for fluency. Some attempts are made to model expressive reading

Score 4: Students are provided with frequent modeling and frequent opportunities to develop their fluency. Expressive reading is consistently modeled and required

Score 5: Students are consistently and effectively provided with opportunities to develop fluency and expression, and the teacher employs several strategies for doing so. The teacher monitors progress and provides constructive feedback to improve fluency.

The charts below show distributions of pretest and posttest frequencies on the SCOPE Literacy Dimension 3 ("Uses diverse instructional strategies to develop students' reading fluency"). WSRP teachers showed significant improvement with respect to Dimension 3: while the majority (63 percent) scored 1 and 2 for the pre-test, more than half (65 percent) were rated 3 or 4 on the post-test. Compare this with their non-WSRP counterparts, the majority of whom remained classified as a 1 or a 2 for both the pre-test (77 percent) and the post-test (74 percent).

Figure 69. SCOPE Literacy Dimension 3 Pretest

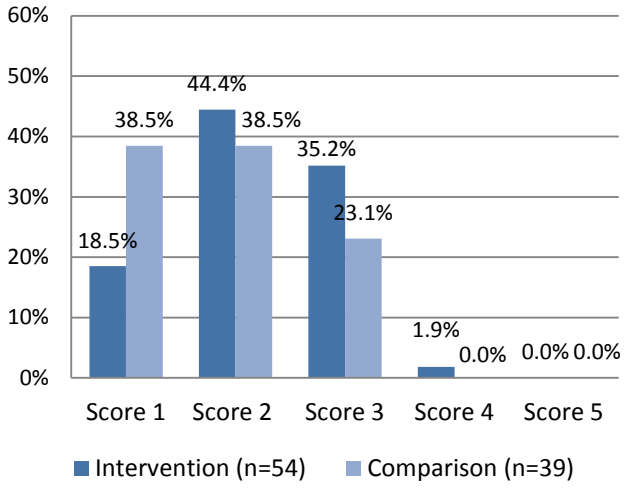
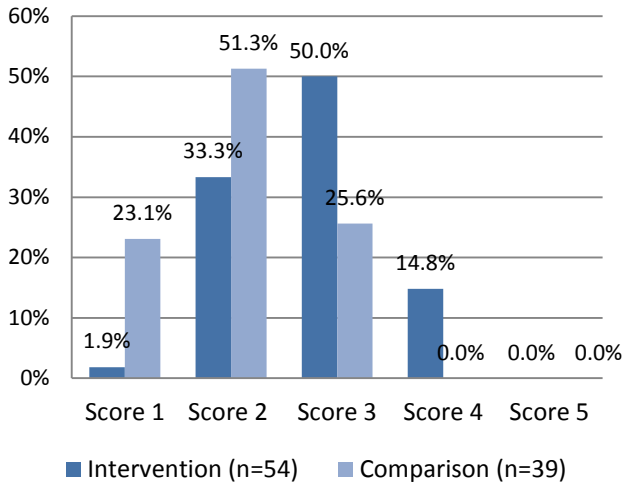


Figure 70. SCOPE Literacy Dimension 3 Posttest



SCOPE LITERACY DIMENSION 4: COMPREHENSION SKILLS

The SCOPE Literacy dimension 4 focused on using diverse instructional strategies to develop students' comprehension skills, and included the following characterization of the scoring scale:

Score 1: The teacher focuses exclusively on repetition or recitation rather than understanding
Score 2: The teacher rarely focuses on comprehension
Score 3: The teacher occasionally focuses on comprehension
Score 4: The teacher frequently focuses on comprehension
Score 5: The teacher consistently focuses on comprehension

The charts below show distributions of pretest and posttest frequencies on the SCOPE Literacy Dimension 4 ("Uses diverse instructional strategies to develop students' comprehension skills"). For this dimension, intervention teachers moved from 74 percent in the 1-2 category to 69 percent in the 3-4 category by the time of the post-test, while their non-WSRP remained relatively stagnant, at 87.2 and 74.3 percent in the 1-2 category for both the pre- and post-test, respectively.

Figure 71. SCOPE Literacy Dimension 4 Pretest

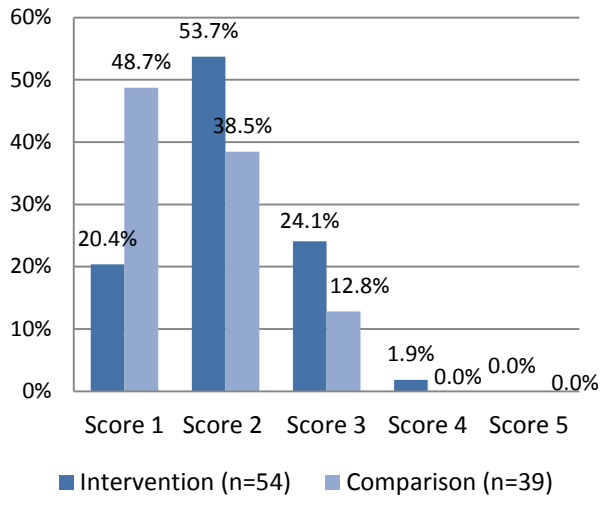
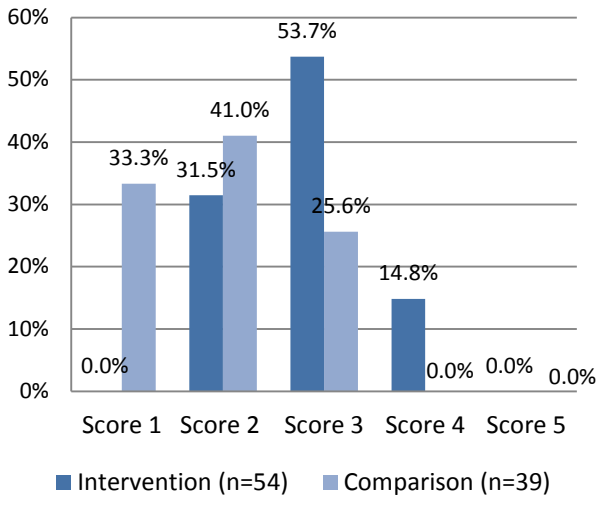


Figure 72. SCOPE Literacy Dimension 4 Posttest



SCOPE LITERACY DIMENSION 5: WRITING SKILLS

The SCOPE dimension 5 focused on implementing instruction that recognizes the importance of independent, original writing in the development of reading skills, and included the following characterization of the scoring scale:

Score 1: The teacher limits writing opportunities to copying or completing exercises and never tolerates errors.

Score 2: The teacher limits writing activities to minimal, basic, and repetitive exercises, and rarely tolerates errors.

Score 3: The teacher occasionally provides opportunities to produce original text and occasionally tolerates errors.

Score 4: The teacher provides frequent opportunities to produce original text and frequently tolerates errors.

Score 5: The teacher consistently provides opportunities to produce original text and consistently helps students learn from their errors and take risks with their speaking and writing.

The charts below show distributions of pretest and posttest frequencies on the SCOPE Literacy Dimension 5 ("Implements instruction that recognizes the importance of independent, original writing in the development of reading skills"). For this dimension, we see similar growth on the part of WSRP teachers: while the proportion of those receiving a 1 dropped from 77.8 percent to 18.5 percent, the share receiving a 3 grew from 1.9 to 27.8 percent (see figure below). By contrast, non-WSRP teachers remained relatively stagnant, with the proportion of those receiving a 1 decreasing only slightly from 79.5 to 74.4 percent and the share of those receiving a 3 rising from only 3 to 8 percent.

Figure 73. SCOPE Literacy Dimension 5 Pretest

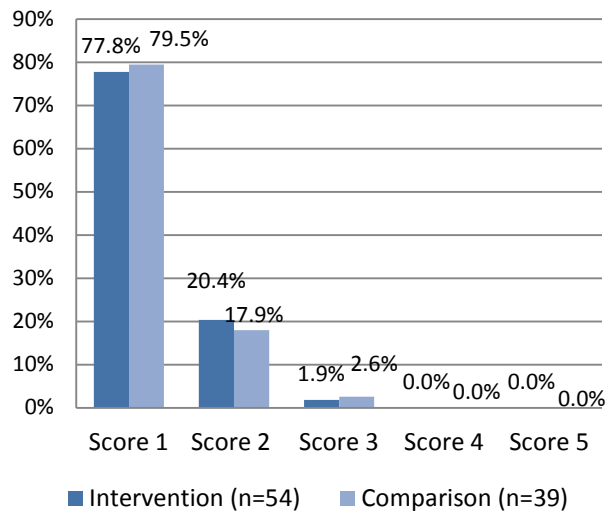
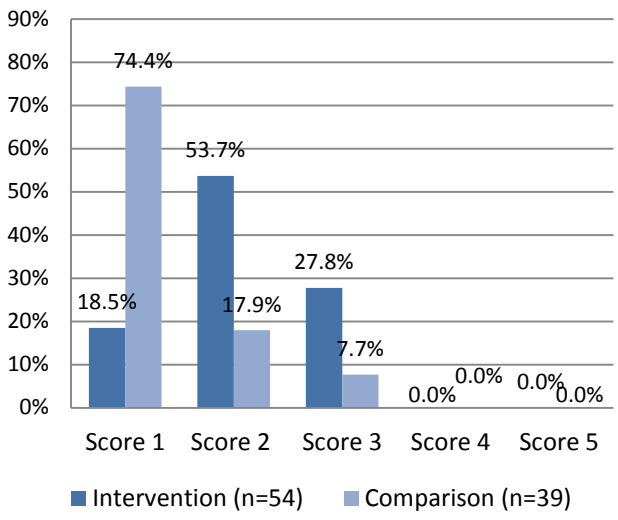


Figure 74. SCOPE Literacy Dimension 5 Posttest



TEACHER BELIEF SURVEY FINDINGS

Teacher beliefs are known to impact their instructional practice. To better understand what intervention and comparison group teachers think about their students' abilities, the appropriateness of different instructional methods for teaching literacy to students, as well as their own classroom practice, WSRP conducted a Beliefs and Instructional Practices Inventory (BIPI) survey at both the beginning and end of the project. The survey consisted of the following sections:

Section A. Teacher's demographic information
Section B. Questions about frequency of use of literacy-related instructional practices in the classroom
Section C. Series of statements about teaching literacy
Section D. Series of statements about students' abilities in relation to literacy

Overall, statistical analyses of changes in BIPI survey responses between the pretest and the posttest showed larger overall positive change in three BIPI sections for the intervention group compared to non-WSRP teachers. For Section B, a comparison of means test showed a statistically significant difference in composite scores between the pretest and posttest. The change was significantly larger for the intervention group. For section C, comparison of means test showed a significant positive change in composite scores between the pretest and the posttest. However, the difference in change in the intervention group and in the comparison group was not statistically significant. Section D was only analyzed descriptively at the dimension level, so no comparison of means test was conducted.

The next three sections of the report present the detailed results of the statistical analysis of the survey data for sections B, C and D. The results of the demographic section of the survey can be found in the Study Participants section of this report.

SECTION B: SELF-REPORTED FREQUENCY OF INSTRUCTIONAL PRACTICES

To determine whether WSRP training resulted in a change in self-reported frequency of utilization of instructional practices emphasized in the WSRP teacher training, a composite score for select practices was created[15]. The gain score was computed from the pretest and posttest data (gain score = posttest composite – pretest composite) and then converted into a percent of correct answers from the total number of items included in the composite. The comparison of means analysis was conducted to determine if there is a difference in changes in the composite gain score between intervention and comparison group teachers.

[15] Sixteen items from Section B (#12, 14, 18, 19, 20, 21, 22, 23, 24, 25, 28, 30, 31, 33, 34, 35) were selected for the composite, with correct responses coded and summed up to make a composite.

The data analysis showed that the change in teacher self-reported practices in both intervention and comparison group between the pretest and the posttest was statistically significant, at $p<.001$ level for the intervention group, and marginally significant for the comparison group, with $p<.01$, as shown in the table below.

Table 36. Comparison of pretest and posttest results for Section B

	Mean Pretest (St. Deviation)	Mean Posttest (St. Deviation)	t	Sig. (2-tailed)
Intervention Group	43.8% (26.639)	69.4% (23.219)	6.167	.000
Comparison Group	46.8% (24.79)	54.5% (25.817)	2.021	.050

The data analysis revealed that the difference in the composite gain score between the intervention and the comparison group teachers is statistically significant, at $p<.001$ level:

Table 37. Comparison of gain score means for Section B

	Mean Difference	Std. Error Difference	t	Sig. (2-tailed)
Composite Section B Gain Score	17.934%	5.696%	3.148	.002

These results show that at the posttest the WSRP teachers increased the proportion of correct answers on the BIPI survey significantly more than the comparison group teachers – despite the fact that the two groups started a very similar level, with teachers answering just under half of the questions correctly.

The following tables present results of descriptive statistical analysis for Section B items. The results are interesting in the context of the student assessment findings discussed in the previous section of the report. The majority of teachers report that they often (5 or more times a month) conduct activities that are designed to help their students understand the meaning of a word or the text they read. For instance, over half of intervention teachers said at the posttest that they frequently implement the following practices:

- Ask students to try to guess or figure out the meaning of a new word by examining how it is used in a text or a sentence (Q14)
- Show students how to try to figure out the meaning of a word by analyzing the root word and the suffixes and/or prefixes (Q15)
- Ask students to predict the content of a story by examining the title or the illustrations (Q19)
- Ask students to tell you what happened in the beginning, middle or end of a story or text they have read idea of a story or a text (Q21)
- Ask students to predict the next events of a story (Q22)
- Ask students to identify what they liked about a story or a text (Q23)

However, the students' performance on the comprehension subtests of the EGRA was still very low. It is possible that the implementation of these teaching strategies was not as frequent or focused as some of the commonly used strategies that are not designed to teach students how to construct text's meaning. For example, the majority of sampled teachers in both intervention and comparison groups said they frequently used the following strategies:

- Ask students to read out loud for you or for classmates (Q16)
- Have students repeat after you the sentences of a text (Q17)
- Ask students to copy from the board texts prepared by the teacher (Q29)

These strategies, although not helpful in teaching comprehension, would contribute to students' reading fluency, which was found to be rather high.

The survey results also show that very few teachers in both groups asked their students to reflect and write their original thoughts. Very few intervention teachers at the pretest, and about a third at the posttest said that they frequently implemented these activities. The proportion of comparison group teachers who said they implemented these teaching strategies frequently was even lower.

- Ask students to write original texts or sentences (i.e. texts or sentences that they have composed themselves, without the support of a model) (Q27)
- Ask students to write a sentence (or more) to summarize what they learned during the day or what they liked about the day (Q28)

Finally, the WSRP literacy program emphasizes the importance of stories and relating elements of stories to children's lives as a foundational tool for teaching children literacy. Fewer than half of surveyed teachers said they implemented these strategies frequently:

- Have students discuss with classmates what they know about the theme or subject of a text before reading it (Q18)
- Ask students to identify whether there are any similarities between the events in a story and their own life experiences (Q24)
- Invite students to tell a story to their classmates (Q35)

In examining the survey data, the movement of responses between the pretest and the posttest is promising, although more research needs to be done to fully understand the extent to which teachers implement practices that are known to be effective in building children's literacy skills. It is also unclear to what extent the intervention contributed to improving teacher practices. Some of the changes between the pretest and the posttest may be due to teachers finding practices more appropriate to implement at the end of the grade than in the beginning.

Table 38. Descriptive analysis of section B

Question	Answer Options	Survey results (%) Intervention (n=54); Comparison (n=39)					
		pretest intervention	pretest comparison	posttest intervention	posttest comparison	gain score intervention	gain score comparison
Q12. Help students use their knowledge of sounds and letters to decode a new word	Often (5 or more times a month)	55.6	76.9	90.7	64.1	35.1	-12.8
	Sometimes, but less than 5 times a month	38.9	20.5	9.3	30.8	-29.6	10.3
	Never	0.0	0.0	0.0	0.0	0.0	0.0
	This is an inappropriate activity to do with students in my grade	0.0	2.6	0.0	5.1	0.0	2.5
	Missing data	5.6	0.0	0.0	0.0	-5.6	0.0
Q13. Ask students to point out periods, commas, exclamation or question marks	Often (5 or more times a month)	68.5	64.1	85.2	71.8	16.7	7.7
	Sometimes, but less than 5 times a month	29.6	33.3	13.0	25.6	-16.6	-7.7
	Never	0.0	0.0	1.9	0.0	0.0	-1.9
	This is an inappropriate activity to do with students in my grade	1.9	2.6	0.0	2.6	-1.9	0.0
	Missing data	0.0	0.0	0.0	0.0	0.0	0.0
Q14. Ask students to try to guess or figure out the meaning of a new word by examining how it is used in a text or a sentence	Often (5 or more times a month)	50.0	38.5	70.4	46.2	20.4	7.7
	Sometimes, but less than 5 times a month	48.1	51.3	27.8	51.3	-20.3	0.0
	Never	0.0	0.0	0.0	2.6	0.0	2.6
	This is an inappropriate activity to do with students in my grade	1.9	7.7	0.0	0.0	-1.9	-7.7
	Missing data	0.0	2.6	1.9	0.0	1.9	-2.6
Q15. Show students how to try to figure out	Often (5 or more times a month)	38.9	35.9	51.9	51.3	13	15.4
	Sometimes, but less than 5 times a month	55.6	46.2	44.4	33.3	-11.2	-12.9

Question	Answer Options	Survey results (%) Intervention (n=54); Comparison (n=39)					
		pretest intervention	pretest comparison	posttest intervention	posttest comparison	gain score intervention	gain score comparison
the meaning of a word by analysing the root word and the suffixes and/or prefixes	Never	3.7	7.7	0.0	10.3	-3.7	2.6
	This is an inappropriate activity to do with students in my grade	1.9	10.3	1.9	2.6	0.0	-7.7
	Missing data	0.0	0.0	1.9	2.6	1.9	2.6
Q16. Ask students to read out loud for you or for classmates	Often (5 or more times a month)	85.2	82.1	90.7	89.7	5.5	7.6
	Sometimes, but less than 5 times a month	13.0	10.3	7.4	7.7	-5.6	-2.6
	Never	1.9	0.0	1.9	0.0	0.0	0.0
	This is an inappropriate activity to do with students in my grade	0.0	5.1	0.0	2.6	0.0	-2.5
	Missing data	0.0	2.6	0.0	0.0	0.0	-2.6
Q17. Have students repeat after you the sentences of a text	Often (5 or more times a month)	66.7	76.9	81.5	74.4	14.8	-2.5
	Sometimes, but less than 5 times a month	27.8	20.5	18.5	23.1	-9.3	2.6
	Never	3.7	0.0	0.0	0.0	-3.7	0.0
	This is an inappropriate activity to do with students in my grade	1.9	2.6	0.0	2.6	-1.9	0.0
	Missing data	0.0	0.0	0.0	0.0	0.0	0.0
Q18. Have students discuss with classmates what they know about the theme or subject of a text before reading it	Often (5 or more times a month)	18.5	12.8	38.9	30.8	20.4	18.0
	Sometimes, but less than 5 times a month	59.3	51.3	61.1	53.8	1.8	2.5
	Never	18.5	20.5	0.0	12.8	-18.5	-7.7
	This is an inappropriate activity to do with students in my grade	3.7	15.4	0.0	2.6	-3.7	-12.8
	Missing data	0.0	0.0	0.0	0.0	0.0	0.0
Q19. Ask students to predict the content of a story	Often (5 or more times a month)	33.3	23.1	64.8	41.0	31.5	17.9
	Sometimes, but less than 5 times a month	55.6	59.0	33.3	46.2	-22.3	-12.8

Question	Answer Options	Survey results (%) Intervention (n=54); Comparison (n=39)					
		pretest intervention	pretest comparison	posttest intervention	posttest comparison	gain score intervention	gain score comparison
by examining the title or the illustrations	Never	7.4	0.0	0.0	5.1	-7.4	5.1
	This is an inappropriate activity to do with students in my grade	1.9	15.4	0.0	7.7	-1.9	-7.7
	Missing data	1.9	2.6	1.9	0.0	0.0	-2.6
Q20. Have students identify the principal idea of a story or a text	Often (5 or more times a month)	44.4	28.2	66.7	48.7	22.3	20.5
	Sometimes, but less than 5 times a month	44.4	43.6	33.3	43.6	-11.1	0.0
	Never	3.7	7.7	0.0	2.6	-3.7	-5.1
	This is an inappropriate activity to do with students in my grade	1.9	10.3	0.0	5.1	-1.9	-5.2
	Missing data	3.7	10.3	0.0	0.0	-3.7	-10.3
Q21. Ask students to tell you what happened in the beginning, middle or end of a story or text they have read idea of a story or a text	Often (5 or more times a month)	44.4	43.6	77.8	46.2	33.4	2.6
	Sometimes, but less than 5 times a month	51.9	43.6	20.4	48.7	-31.5	5.1
	Never	1.9	0.0	0.0	0.0	-1.9	0.0
	This is an inappropriate activity to do with students in my grade	0.0	7.7	1.9	5.1	1.9	-2.6
	Missing data	0.0	5.1	0.0	0.0	0.0	-5.1
Q22. Ask students to predict the next events of a story	Often (5 or more times a month)	33.3	30.8	68.5	53.8	0.0	0.0
	Sometimes, but less than 5 times a month	59.3	48.7	29.6	35.9	-29.7	-12.8
	Never	3.7	5.1	0.0	5.1	-3.7	0.0
	This is an inappropriate activity to do with students in my grade	0.0	10.3	1.9	5.1	1.9	-5.2
	Missing data	3.7	5.1	0.0	0.0	-3.7	-5.1
Q23. Ask students to identify what	Often (5 or more times a month)	51.9	61.5	81.5	61.5	29.6	0.0
	Sometimes, but less than 5	44.4	33.3	18.5	33.3	-25.9	0.0

Question	Answer Options	Survey results (%) Intervention (n=54); Comparison (n=39)					
		pretest intervention	pretest comparison	posttest intervention	posttest comparison	gain score intervention	gain score comparison
they liked about a story or a text	times a month						
	Never	1.9	0.0	0.0	0.0	-1.9	0.0
	This is an inappropriate activity to do with students in my grade	0.0	5.1	0.0	5.1	0.0	0.0
	Missing data	1.9	0.0	0.0	0.0	-1.9	0.0
Q24. Ask students to identify whether there are any similarities between the events in a story and their own life experiences	Often (5 or more times a month)	35.2	41.0	48.7	48.7	13.5	7.7
	Sometimes, but less than 5 times a month	61.1	41.0	48.7	48.7	-12.4	7.7
	Never	3.7	7.7	2.6	2.6	-1.1	-5.1
	This is an inappropriate activity to do with students in my grade	0.0	10.3	0.0	0.0	0.0	-10.3
	Missing data	0.0	0.0	0.0	0.0	-25.9	0.0
Q25. Invite students to read texts or books they choose on their own	Often (5 or more times a month)	66.7	51.3	88.9	53.8	22.2	2.5
	Sometimes, but less than 5 times a month	31.5	33.3	11.1	46.2	-20.4	12.9
	Never	1.9	10.3	0.0	0.0	-1.9	-10.3
	This is an inappropriate activity to do with students in my grade	0.0	2.6	0.0	0.0	0.0	-2.6
	Missing data	0.0	2.6	0.0	0.0	0.0	-2.6
Q26. Invite students to read texts or stories that are NOT in their textbook	Often (5 or more times a month)	31.5	23.1	61.1	33.3	29.6	10.2
	Sometimes, but less than 5 times a month	51.9	48.7	37.0	46.2	-14.9	-2.5
	Never	13.0	20.5	1.9	10.3	-11.1	-10.2
	This is an inappropriate activity to do with students in my grade	3.7	7.7	61.1	10.3	57.4	2.6
	Missing data	0.0	0.0	0.0	0.0	0.0	0.0
Q27. Ask students to write original	Often (5 or more times a month)	18.5	5.1	33.3	17.9	14.8	12.8
	Sometimes, but less than 5	59.3	56.4	53.7	61.5	-5.6	5.1

Question	Answer Options	Survey results (%) Intervention (n=54); Comparison (n=39)					
		pretest intervention	pretest comparison	posttest intervention	posttest comparison	gain score intervention	gain score comparison
texts or sentences (i.e. texts or sentences that they have composed themselves, without the support of a model)	times a month						
	Never	13.0	20.5	7.4	5.1	-5.6	-15.4
	This is an inappropriate activity to do with students in my grade	9.3	17.9	5.6	15.4	-3.7	-2.5
	Missing data	0.0	0.0	0.0	0.0	0.0	0.0
Q28. Ask students to write a sentence (or more) to summarize what they learned during the day or what they liked about the day	Often (5 or more times a month)	16.7	10.3	35.2	7.7	18.5	-2.6
	Sometimes, but less than 5 times a month	51.9	43.6	55.6	69.2	3.7	25.6
	Never	20.4	28.2	5.6	10.3	-14.8	-17.9
	This is an inappropriate activity to do with students in my grade	11.1	17.9	3.7	12.8	-7.4	-5.1
	Missing data	0.0	0.0	0.0	0.0	0.0	0.0
Q29.Ask students to copy from the board texts prepared by the teacher	Often (5 or more times a month)	57.4	76.9	48.1	66.7	-9.3	-10.2
	Sometimes, but less than 5 times a month	35.2	17.9	44.4	30.8	9.2	12.9
	Never	3.7	0.0	3.7	0.0	0.0	0.0
	This is an inappropriate activity to do with students in my grade	0.0	5.1	3.7	2.6	3.7	-2.5
	Missing data	3.7	0.0	0.0	0.0	-3.7	0.0
Q30. Read stories to your students	Often (5 or more times a month)	75.9	74.4	90.7	82.1	14.8	7.7
	Sometimes, but less than 5 times a month	22.2	20.5	9.3	15.4	-12.9	-5.1
	Never	0.0	0.0	0.0	0.0	0.0	0.0
	This is an inappropriate activity to do with students in my grade	0.0	5.1	0.0	2.6	0.0	-2.5
	Missing data	1.9	0.0	0.0	0.0	-1.9	0.0

Question	Answer Options	Survey results (%) Intervention (n=54); Comparison (n=39)					
		pretest intervention	pretest comparison	posttest intervention	posttest comparison	gain score intervention	gain score comparison
Q31. Ask students to use their textbooks, their word lists or posters in the classroom to check the spelling of new words	Often (5 or more times a month)	42.6	59.0	77.8	53.8	35.2	-5.2
	Sometimes, but less than 5 times a month	50.0	30.8	20.4	43.6	-29.6	12.8
	Never	3.7	2.6	1.9	2.6	-1.8	0.0
	This is an inappropriate activity to do with students in my grade	3.7	7.7	0.0	0.0	-3.7	-7.7
	Missing data	0.0	0.0	0.0	0.0	0.0	0.0
Q32. Ask students to look over the text of a classmate to correct spelling, grammar or punctuation errors	Often (5 or more times a month)	27.8	28.2	55.6	43.6	27.8	15.4
	Sometimes, but less than 5 times a month	53.7	46.2	35.2	41.0	-18.5	-5.2
	Never	16.7	17.9	9.3	10.3	-7.4	-7.6
	This is an inappropriate activity to do with students in my grade	1.9	7.7	0.0	5.1	-1.9	-2.6
	Missing data	0.0	0.0	0.0	0.0	0.0	0.0
Q33. Ask students to complete reading assignments at home (as homework)	Often (5 or more times a month)	61.1	69.2	75.9	76.9	14.8	7.7
	Sometimes, but less than 5 times a month	37.0	23.1	22.2	17.9	-14.8	-5.2
	Never	1.9	0.0	1.9	0.0	0.0	0.0
	This is an inappropriate activity to do with students in my grade	0.0	7.7	0.0	5.1	0.0	-2.6
	Missing data	0.0	0.0	0.0	0.0	0.0	0.0
Q34. Ask students to complete writing assignments at home (as homework)	Often (5 or more times a month)	74.1	71.8	83.3	82.1	9.2	10.3
	Sometimes, but less than 5 times a month	22.2	20.5	16.7	12.8	-5.5	-7.7
	Never	3.7	2.6	0.0	0.0	-3.7	-2.6
	This is an inappropriate activity to do with students in my grade	0.0	5.1	0.0	5.1	0.0	0.0
	Missing data	0.0	0.0	0.0	0.0	0.0	0.0

Question	Answer Options	Survey results (%) Intervention (n=54); Comparison (n=39)					
		pretest intervention	pretest comparison	posttest intervention	posttest comparison	gain score intervention	gain score comparison
Q35. Invite students to tell a story to their classmates	Often (5 or more times a month)	29.6	10.3	38.9	25.6	9.3	15.3
	Sometimes, but less than 5 times a month	63.0	66.7	59.3	59.0	-3.7	-7.7
	Never	3.7	7.7	1.9	10.3	-1.8	2.6
	This is an inappropriate activity to do with students in my grade	1.9	15.4	0.0	5.1	-1.9	-10.3
	Missing data	1.9	0.0	0.0	0.0	-1.9	0
Q36. Help students memorize whole words by sight, without having to sound them out.	Often (5 or more times a month)	18.5	30.8	40.7	33.3	22.2	2.5
	Sometimes, but less than 5 times a month	55.6	46.2	42.6	46.2	-13	0.0
	Never	24.1	15.4	14.8	17.9	-9.3	2.5
	This is an inappropriate activity to do with students in my grade	1.9	7.7	1.9	2.6	0.0	-5.1
	Missing data	0.0	0.0	0.0	0.0	0.0	0.0

SECTION C: BELIEFS ABOUT TEACHING LITERACY

To determine whether WSRP training resulted in a change in teacher beliefs and attitudes relating to teaching literacy, a composite score for select practices was created[16]. The gain score was computed from the pretest and posttest data (gain score = posttest composite – pretest composite) and then converted into a percent of correctly answered questions from the total number of questions in the composite. The comparison of means analysis was conducted to determine if there is a difference in changes in the composite gain score between intervention and comparison group teachers.

The data analysis showed that the change in teacher beliefs in both the intervention and the comparison between the pretest and the posttest was statistically significant, at $p<.01$ level for the intervention group, and marginally significant for the comparison group, with $p<.01$, as shown in the table below.

Table 39. Comparison of pretest and posttest results

	Mean Pretest (St. Deviation)	Mean Posttest (St. Deviation)	t	Sig. (2-tailed)
Intervention Group	63.8% (10.655)	71.6% (12.154)	3.320	.002
Comparison Group	62% (12.146)	66.1% (12.956)	2.001	.052

The data analysis revealed no statistically significant difference in the composite gain score between the intervention and the comparison group teachers:

	Mean Difference	Std. Error Difference	t	Sig. (2-tailed)
Composite Section B Gain Score	3.573 (3.064)	3.155	1.133	.260 (not significant)

The following tables demonstrate results of descriptive statistical analysis for Section C items. Differently from self-reported instructional practices that may naturally fluctuate between different points in the academic year, teacher beliefs about teaching literacy are not expected to change without an external stimulus. Thus, we would not expect to see much difference between the pretest and the posttest responses of the comparison group teachers. The WSRP teachers, however, were expected to have changed their beliefs about fundamental principles of teaching and learning literacy.

An examination of the Section C results showed that the vast majority of all surveyed teachers believe children can learn to read and write, although between one-fourth and one-fifth of comparison group teachers disagreed that all children can learn to read. About half of teachers thought that students have

[16] Fourteen items from Section C (#37,38,41,42,43,44,45,46,47,48,49,52,53,55) were selected for the composite, with correct answers coded as 1, incorrect answers coded as 0, and the total computed.

a lot of difficulty learning to write (Q39), and a little less than half also thought it's hard for kids to learn to read (Q50).

Traditional approach to teaching literacy emphasized recitation and memorization, so it is not surprising that the majority of teachers think that if a student makes a spelling error when attempting to write for the first time it's a major concern (Q41). About a third of the surveyed teachers also thought that students must be able to recite a text before they can read it (Q 42). Nearly all surveyed teachers said that it is important to correct all the errors in sentences students produce (Q47). The majority of teachers also said that learning to recite a text is a first step in learning how to read it (Q53).

However, in some areas WSRP teachers showed positive changes. The proportion of WSRP teachers who agreed with the statement that it is better to teach reading and writing as two separate subjects (Q43) dropped by half between the pretest and the posttest, likely due to the intervention, although the majority of teachers still thought that children must learn to read before they can learn to write (Q44). Encouragingly, the vast majority of teachers agreed that it is important to give students time each day to write freely on topics of their own choosing (Q46), and that reading stories to students helps them develop their reading skills (Q49).

Overall, many of the reported beliefs are in line with the traditional way of approaching instruction in literacy. While the WSRP program emphasized that the value of recitation is questioned by contemporary research on literacy, it is likely to take longer than a year to change deeply engrained beliefs of experienced teachers. The project did open a door for examining teacher practices, and many more WSRP teachers said at the posttest that they had opportunities to talk to colleagues about teaching reading and writing than comparison group teachers. Such conversations are undoubtedly beneficial for teachers' continuous professional development.

Table 40: Descriptive analysis of section C

Question	Answer Options	Survey results (%) Intervention (n=54); Comparison (n=39)					
		pretest intervention	pretest comparison	posttest intervention	posttest comparison	gain score intervention	gain score comparison
Q37. All learners can learn to read	Agree	90.7	76.9	87.0	76.9	-3.7	0.0
	Disagree	9.3	20.5	13.0	23.1	3.7	2.6
	No opinion	0.0	2.6	0.0	0.0	0.0	-2.6
	Missing data	0.0	0.0	0.0	0.0	0.0	0.0
Q38. All learners can learn to write	Agree	100.0	97.4	98.1	97.4	-1.9	0.0
	Disagree	0.0	2.6	1.9	2.6	1.9	0.0
	No opinion	0.0	0.0	0.0	0.0	0.0	0.0
	Missing data	0.0	0.0	0.0	0.0	0.0	0.0
Q39. Students have a lot of difficulty learning to write	Agree	51.9	53.8	55.6	35.9	3.7	-17.9
	Disagree	48.1	43.6	42.6	61.5	-5.5	17.9
	No opinion	0.0	2.6	0.0	2.6	0.0	0.0
	Missing data	0.0	0.0	1.9	0.0	1.9	0.0
Q40. If I had sufficient reading material in my classroom, I would give students time each day to read freely materials of their own choosing	Agree	96.3	89.7	98.1	94.9	1.8	5.2
	Disagree	3.7	10.3	1.9	5.1	-1.8	-5.2
	No opinion	0.0	0.0	0.0	0.0	0.0	0.0
	Missing data	0.0	0.0	0.0	0.0	0.0	0.0
Q41. If a student makes an error spelling a word that he/she is attempting to write for the first time, it's not a major concern.	Agree	40.7	41.0	46.2	46.2	5.5	5.2
	Disagree	59.3	56.4	53.8	53.8	-5.5	-2.6
	No opinion	0.0	2.6	0.0	0.0	0.0	-2.6
	Missing data	0.0	0.0	0.0	0.0	0.0	0.0
Q42. Students must be able to recite a text before they can	Agree	42.6	35.9	35.2	41.0	-7.4	5.1
	Disagree	53.7	56.4	57.4	53.8	3.7	-2.6

Question	Answer Options	Survey results (%) Intervention (n=54); Comparison (n=39)					
		pretest intervention	pretest comparison	posttest intervention	posttest comparison	gain score intervention	gain score comparison
read it	No opinion	1.9	7.7	1.9	2.6	0.0	-5.1
	Missing data	1.9	0.0	5.6	2.6	3.7	2.6
Q43. It is better to teach reading and writing as two separate subjects, so as to not confuse the students	Agree	50.0	48.7	25.9	43.6	-24.1	-5.1
	Disagree	48.1	48.7	74.1	56.4	26	7.7
	No opinion	1.9	2.6	0.0	0.0	-1.9	-2.6
	Missing data	0.0	0.0	0.0	0.0	0.0	0.0
Q44. One must learn to read before one can learn to write	Agree	59.3	48.7	66.7	56.4	7.4	7.7
	Disagree	38.9	46.2	33.3	38.5	-5.6	-7.7
	No opinion	1.9	2.6	0.0	5.1	-1.9	2.5
	Missing data	0.0	2.6	0.0	0.0	0.0	-2.6
Q45. Students can't write an original text (ie, a sentence or short text they have composed themselves) until at least grade 3 or 4	Agree	38.5	38.5	33.3	59.0	-5.2	20.5
	Disagree	53.8	53.8	64.8	38.5	11	-15.3
	No opinion	5.1	5.1	1.9	2.6	-3.2	-2.5
	Missing data	0.0	2.6	0.0	0.0	0.0	-2.6
Q46. It is important to give students time each day to write freely on topics of their own choosing	Agree	94.4	79.5	96.3	87.2	1.9	7.7
	Disagree	3.7	20.5	1.9	10.3	-1.8	-10.2
	No opinion	1.9	0.0	0.0	2.6	-1.9	2.6
	Missing data	0.0	0.0	1.9	0.0	1.9	0.0
Q47. It is important to correct all the errors in sentences students produce	Agree	96.3	94.9	83.3	94.9	-13	0.0
	Disagree	1.9	5.1	13.0	2.6	11.1	-2.5
	No opinion	1.9	0.0	1.9	2.6	0.0	2.6
	Missing data	0.0	0.0	1.9	0.0	1.9	0.0
Q48. Before having students read a text for the first time, it is important to have a discussion with them about	Agree	94.4	92.3	94.4	94.9	0.0	2.6
	Disagree	5.6	5.1	1.9	2.6	-3.7	-2.5
	No opinion	0.0	2.6	1.9	2.6	1.9	0.0

Question	Answer Options	Survey results (%) Intervention (n=54); Comparison (n=39)					
		pretest intervention	pretest comparison	posttest intervention	posttest comparison	gain score intervention	gain score comparison
what they know about the subject addressed in the text	Missing data	0.0	0.0	1.9	0.0	1.9	0.0
Q49. Reading stories to students helps them develop their reading skills	Agree	92.6	97.4	92.6	97.4	0.0	0.0
	Disagree	7.4	2.6	5.6	0.0	-1.8	-2.6
	No opinion	0.0	0.0	0.0	0.0	0.0	0.0
	Missing data	0.0	0.0	1.9	2.6	1.9	2.6
Q50. It is very difficult for students to learn to read	Agree	40.7	38.5	20.4	41.0	-20.3	2.5
	Disagree	55.6	59.0	75.9	53.8	20.3	-5.2
	No opinion	3.7	2.6	3.7	5.1	0.0	2.5
	Missing data	0.0	0.0	0.0	0.0	0.0	0.0
Q51. It is very difficult for students to learn to write	Agree	25.9	20.5	16.7	28.2	-9.2	7.7
	Disagree	72.2	79.5	83.3	69.2	11.1	-10.3
	No opinion	1.9	0.0	0.0	2.6	-1.9	2.6
	Missing data	0.0	0.0	0.0	0.0	0.0	0.0
Q52. Young students must memorize a text before they can understand it	Agree	29.6	38.5	24.1	25.6	-5.5	-12.9
	Disagree	70.4	61.5	75.9	69.2	5.5	7.7
	No opinion	0.0	0.0	0.0	2.6	0.0	2.6
	Missing data	0.0	0.0	0.0	2.6	0.0	2.6
Q53. Learning to recite a text is a first step in learning how to read it	Agree	59.3	53.8	74.1	69.2	14.8	15.4
	Disagree	38.9	43.6	25.9	28.2	-13	-15.4
	No opinion	1.9	2.6	0.0	2.6	-1.9	0.0
	Missing data	0.0	0.0	0.0	0.0	0.0	0.0
Q54. Silent reading should be avoided, because the teacher can't check if students are actually reading or reading correctly	Agree	55.6	76.9	64.8	46.2	9.2	-30.7
	Disagree	42.6	20.5	29.6	43.6	-13	23.1
	No opinion	1.9	2.6	5.6	10.3	3.7	7.7
	Missing data	0.0	0.0	0.0	0.0	0.0	0.0

Question	Answer Options	Survey results (%) Intervention (n=54); Comparison (n=39)					
		pretest intervention	pretest comparison	posttest intervention	posttest comparison	gain score intervention	gain score comparison
Q55. A student who writes "well" is a student who does not make any grammatical or spelling mistakes	Agree	20.4	20.5	13.0	10.3	-7.4	-10.2
	Disagree	77.8	76.9	87.0	84.6	9.2	7.7
	No opinion	1.9	2.6	0.0	5.1	-1.9	2.5
	Missing data	0.0	0.0	0.0	0.0	0.0	0.0
Q56. I have received adequate training on how to teach reading	Agree	38.9	33.3	79.6	41.0	40.7	7.7
	Disagree	50.0	51.3	18.5	46.2	-31.5	-5.1
	No opinion	9.3	10.3	1.9	12.8	-7.4	2.5
	Missing data	1.9	5.1	0.0	0.0	-1.9	-5.1
Q57. I have received adequate training on how to teach writing	Agree	33.3	30.8	72.2	43.6	38.9	12.8
	Disagree	55.6	51.3	24.1	41.0	-31.5	-10.3
	No opinion	9.3	12.8	3.7	15.4	-5.6	2.6
	Missing data	1.9	5.1	0.0	0.0	-1.9	-5.1
Q58. I often have opportunities to talk to colleagues about how to teach reading	Agree	66.7	66.7	90.7	69.2	24	2.5
	Disagree	24.1	20.5	9.3	15.4	-14.8	-5.1
	No opinion	5.6	12.8	0.0	15.4	-5.6	2.6
	Missing data	3.7	0.0	0.0	0.0	-3.7	0.0
Q59. I often have opportunities to talk to colleagues about how to teach writing	Agree	70.4	69.2	88.9	69.2	18.5	0.0
	Disagree	20.4	15.4	9.3	15.4	-11.1	0.0
	No opinion	3.7	15.4	1.9	15.4	-1.8	0.0
	Missing data	5.6	0.0	0.0	0.0	-5.6	0.0

SECTION D: TEACHER BELIEFS ABOUT ABILITIES OF THEIR STUDENTS

The descriptive statistical analysis of Section D of the BIPI survey showed overall positive changes between the pretest and the posttest for both intervention and comparison group teachers. While at the pretest many teachers said their students could not read or write till higher elementary grades, at the posttest more teachers said that students could have those skills at the early elementary grades, or even before the start of grade 1.

Below is a summary of the descriptive statistics in graphical format for section D. Teacher responses to this section of the survey help better understand what expectations teachers set for their students, and what skills they view as essential. For example, while 40 percent of the intervention teachers said at the posttest that students should be able to read out load a simple text before the start of grade 1 (Q60), less than a half of that said they should be able to understand the text they are reading (Q61).

The WSRP teachers demonstrated some important changes in their views of appropriate skills for different grades. For instance, at the pretest about a quarter of them said that a student should be able to infer or deduce the meaning of a new word by looking at how it is used in the sentence by the end of grade 2 (Q66), while at the posttest this point of view was expressed by more than a half of the intervention teachers. Opinions of the comparison group teachers on this question remained virtually unchanged. The intervention appeared to have a similar impact on teachers' opinions about teaching writing: the proportion of the WSRP teachers who said students should be able to write an original text of two or more sentences by the end of grade two (Q62) doubled between the pretest and the posttest. More WSRP teachers believed that students should be able to express their opinions on a text they have read by the end of grade two or earlier at the posttest than at the pretest.

Many surveyed teachers expressed a belief that students should have fundamental literacy skills (such as knowing letters of the alphabet and being able to write them; being able to read simple text and answer simple comprehension questions; use common punctuation) in place before the start of grade 1. Without additional research, it is unclear whether teachers consider students *capable* of having these skills, or *having* these skills in place in order to do well in school. Finally, it is perhaps a manifestation of the traditional teaching approach that more teachers said that students can spell words correctly (Q64) or read text of their own choosing (Q68) before the start of grade 1, than express their opinions on a text they have read (Q67), make a prediction about a story (Q72) or explain what they liked or did not like about the story (Q73). While the core of the WSRP program is based on connecting literacy instruction to what's meaningful in children's lives, traditionally held beliefs that young children cannot have authentic thoughts and opinions still persist.

Table 41: Descriptive analysis of section D: Teachers' perceptions of students' reading and writing skills

Question	Answer Options	Survey results (%) Intervention (n=54); Comparison (n=39)					
		pretest intervention	pretest comparison	posttest intervention	posttest comparison	gain score intervention	gain score comparison
Q60. Read out loud, and with few errors, a simple text (2 to 3 sentences) that they have never seen before	Before the start of Grade 1	20.4	23.1	40.7	10.3	20.3	-12.8
	By the end of Grade 2	61.1	59.0	53.7	74.4	-7.4	15.4
	By the end of Grade 4	14.8	17.9	5.6	15.4	-9.2	-2.5
	By the end of Grade 6	1.9	0.0	0.0	0.0	-1.9	0
	Not an important skill	1.9	0.0	0.0	0.0	-1.9	0
	Missing data	0.0	0.0	0.0	0.0	0	0
Q61. Understand texts they are reading	Before the start of Grade 1	5.6	7.7	18.5	5.1	12.9	-2.6
	By the end of Grade 2	55.6	66.7	68.5	74.4	12.9	7.7
	By the end of Grade 4	37.0	25.6	13.0	20.5	-24	-5.1
	By the end of Grade 6	1.9	0.0	0.0	0.0	-1.9	0
	Not an important skill	0.0	0.0	0.0	0.0	0	0
	Missing data	0.0	0.0	0.0	0.0	0	0
Q62. Write an original text of 2 or more sentences (one they have created themselves as opposed to a text they have copied from the board or created based on a model supplied by the teacher)	Before the start of Grade 1	7.4	5.1	7.4	0.0	0	-5.1
	By the end of Grade 2	33.3	28.2	70.4	43.6	37.1	15.4
	By the end of Grade 4	55.6	64.1	20.4	46.2	-35.2	-17.9
	By the end of Grade 6	1.9	2.6	1.9	7.7	0	5.1
	Not an important skill	1.9	0.0	0.0	2.6	-1.9	2.6
	Missing data	0.0	0.0	0.0	0.0	0	0
Q63. Review a classmate's text in order to help him/her correct spelling or grammar mistakes	Before the start of Grade 1	3.7	2.6	9.3	10.3	5.6	7.7
	By the end of Grade 2	31.5	35.9	50.0	53.8	18.5	17.9
	By the end of Grade 4	59.3	59.0	37.0	30.8	-22.3	-28.2
	By the end of Grade 6	1.9	2.6	3.7	2.6	1.8	0

	Not an important skill	3.7	0.0	0.0	2.6	-3.7	2.6
	Missing data	0.0	0.0	0.0	0.0	0	0
Q64. Spell correctly common or frequently encountered words	Before the start of Grade 1	9.3	15.4	24.1	23.1	14.8	7.7
	By the end of Grade 2	57.4	53.8	66.7	51.3	9.3	-2.5
	By the end of Grade 4	31.5	30.8	7.4	23.1	-24.1	-7.7
	By the end of Grade 6	1.9	0.0	1.9	2.6	0	2.6
	Not an important skill	0.0	0.0	0.0	0.0	0	0
	Missing data	0.0	0.0	0.0	0.0	0	0
Q65. Use common punctuation (period, question mark, exclamation mark) correctly in their original productions	Before the start of Grade 1	5.6	10.3	20.4	7.7	14.8	-2.6
	By the end of Grade 2	46.3	51.3	63.0	64.1	16.7	12.8
	By the end of Grade 4	44.4	38.5	14.8	23.1	-29.6	-15.4
	By the end of Grade 6	3.7	0.0	1.9	5.1	-1.8	5.1
	Not an important skill	0.0	0.0	0.0	0.0	0	0
	Missing data	0.0	0.0	0.0	0.0	0	0
Q66. Infer or deduce the meaning of a new word by looking at how it is used in the sentence	Before the start of Grade 1	1.9	2.6	18.5	7.7	16.6	5.1
	By the end of Grade 2	24.1	33.3	51.9	38.5	27.8	5.2
	By the end of Grade 4	68.5	64.1	24.1	43.6	-44.4	-20.5
	By the end of Grade 6	3.7	0.0	5.6	10.3	1.9	10.3
	Not an important skill	1.9	0.0	0.0	0.0	-1.9	0
	Missing data	0.0	0.0	0.0	0.0	0	0
Q67. Express their opinions on a text they have read	Before the start of Grade 1	1.9	2.6	18.5	5.1	16.6	2.5
	By the end of Grade 2	25.9	20.5	51.9	35.9	26	15.4
	By the end of Grade 4	68.5	76.9	24.1	38.5	-44.4	-38.4
	By the end of Grade 6	1.9	0.0	5.6	20.5	3.7	20.5
	Not an important skill	1.9	0.0	0.0	0.0	-1.9	0
	Missing data	0.0	0.0	0.0	0.0	0	0
Q68. Read texts of their own choosing (ie, that they	Before the start of Grade 1	3.7	5.1	24.1	12.8	20.4	7.7
	By the end of Grade 2	46.3	35.9	63.0	51.3	16.7	15.4

have chosen themselves)	By the end of Grade 4	46.3	56.4	7.4	28.2	-38.9	-28.2
	By the end of Grade 6	1.9	0.0	1.9	7.7	0	7.7
	Not an important skill	1.9	2.6	3.7	0.0	1.8	-2.6
	Missing data	0.0	0.0	0.0	0.0	0	0
Q69. Recognize all the letters of the alphabet and the sound each letter represents	Before the start of Grade 1	61.1	56.4	81.5	76.9	20.4	20.5
	By the end of Grade 2	33.3	41.0	18.5	17.9	-14.8	-23.1
	By the end of Grade 4	3.7	2.6	0.0	2.6	-3.7	0
	By the end of Grade 6	1.9	0.0	0.0	2.6	-1.9	2.6
	Not an important skill	0.0	0.0	0.0	0.0	0	0
	Missing data	0.0	0.0	0.0	0.0	0	0
Q70. Decode new words without the teachers' help by making correct letter-associations	Before the start of Grade 1	11.1	12.8	22.2	10.3	11.1	-2.5
	By the end of Grade 2	44.4	38.5	57.4	48.7	13	10.2
	By the end of Grade 4	44.4	46.2	14.8	33.3	-29.6	-12.9
	By the end of Grade 6	0.0	2.6	5.6	7.7	5.6	5.1
	Not an important skill	0.0	0.0	0.0	0.0	0	0
	Missing data	0.0	0.0	0.0	0.0	0	0
Q71. Recognize and read common or frequently encountered words.	Before the start of Grade 1	18.5	23.1	22.2	15.4	3.7	-7.7
	By the end of Grade 2	53.7	56.4	64.8	71.8	11.1	15.4
	By the end of Grade 4	27.8	20.5	9.3	12.8	-18.5	-7.7
	By the end of Grade 6	0.0	0.0	3.7	0.0	3.7	0
	Not an important skill	0.0	0.0	0.0	0.0	0	0
	Missing data	0.0	0.0	0.0	0.0	0	0
Q72. Make a hypothesis or a predication about what a text or story is about by looking at the title or the illustrations	Before the start of Grade 1	1.9	5.1	13.0	28.2	11.1	23.1
	By the end of Grade 2	24.1	28.2	38.9	41.0	14.8	12.8
	By the end of Grade 4	74.1	66.7	35.2	15.4	-38.9	-51.3
	By the end of Grade 6	0.0	0.0	13.0	2.6	13	2.6
	Not an important skill	0.0	0.0	0.0	12.8	0	12.8
	Missing data	0.0	0.0	0.0	0.0	0	0

Q73. Explain what they liked or didn't like about a story or text they have read	Before the start of Grade 1	3.7	5.1	14.8	10.3	11.1	5.2
	By the end of Grade 2	31.5	28.2	48.1	38.5	16.6	10.3
	By the end of Grade 4	64.8	66.7	33.3	41.0	-31.5	-25.7
	By the end of Grade 6	0.0	0.0	3.7	7.7	3.7	7.7
	Not an important skill	0.0	0.0	0.0	2.6	0	2.6
	Missing data	0.0	0.0	0.0	0.0	0	0
Q74. Answer simple oral questions (where a text takes place, who are the main characters, when it takes place…) about a text they have read	Before the start of Grade 1	11.1	7.7	24.1	17.9	13	10.2
	By the end of Grade 2	68.5	64.1	72.2	61.5	3.7	-2.6
	By the end of Grade 4	20.4	28.2	3.7	17.9	-16.7	-10.3
	By the end of Grade 6	0.0	0.0	0.0	0.0	0	0
	Not an important skill	0.0	0.0	0.0	2.6	0	2.6
	Missing data	0.0	0.0	0.0	0.0	0	0
Q75. Write all the letters of the alphabet independently (as opposed to copying letters from the board or from their textbook)	Before the start of Grade 1	48.1	41.0	66.7	56.4	18.6	15.4
	By the end of Grade 2	50.0	51.3	33.3	43.6	-16.7	-7.7
	By the end of Grade 4	1.9	5.1	0.0	0.0	-1.9	-5.1
	By the end of Grade 6	0.0	0.0	0.0	0.0	0	0
	Not an important skill	0.0	2.6	0.0	0.0	0	-2.6
	Missing data	0.0	0.0	0.0	0.0	0	0
Q76. Write (and spell) simple words correctly (as opposed to copying simple words from the board or from a book)	Before the start of Grade 1	20.4	20.5	29.6	25.6	9.2	5.1
	By the end of Grade 2	72.2	66.7	64.8	71.8	-7.4	5.1
	By the end of Grade 4	7.4	12.8	1.9	2.6	-5.5	-10.2
	By the end of Grade 6	0.0	0.0	3.7	0.0	3.7	0
	Not an important skill	0.0	0.0	0.0	0.0	0	0
	Missing data	0.0	0.0	0.0	0.0	0	0
Q77. Write simple sentences on their own (as opposed to copying sentences from the board or from a book)	Before the start of Grade 1	7.4	5.1	22.2	7.7	14.8	2.6
	By the end of Grade 2	59.3	59.0	50.0	59.0	-9.3	0
	By the end of Grade 4	31.5	35.9	27.8	25.6	-3.7	-10.3
	By the end of Grade 6	1.9	0.0	0.0	7.7	-1.9	7.7

	Not an important skill	0.0	0.0	0.0	0.0	0	0
	Missing data	0.0	0.0	0.0	0.0	0	0
Q78. Write answers to teacher questions about what they have read or a text that has been read to them.	Before the start of Grade 1	1.9	7.7	14.8	10.3	12.9	2.6
	By the end of Grade 2	40.7	38.5	61.1	43.6	20.4	5.1
	By the end of Grade 4	57.4	53.8	24.1	35.9	-33.3	-17.9
	By the end of Grade 6	0.0	0.0	0.0	10.3	0	10.3
	Not an important skill	0.0	0.0	0.0	0.0	0	0
	Missing data	0.0	0.0	0.0	0.0	0	0

CROSS-DATASET ANALYSES

A number of statistical analyses were performed to better understand the relationships between variables and variable composites in the three data sets discussed in this report. In order to make cross-dataset analyses possible, all three data sets were merged into a single dataset. Mean student performance for each teacher was computed and merged together with the SCOPE Literacy and BIPI results for each teacher. Thus, the final data set contained data from teacher survey (BIPI), teacher observations (SCOPE Literacy) and mean student achievement results from the classes of the teachers (EGRA).

Bivariate correlations and regression analysis were conducted to explore relationships between teacher practice as documented through SCOPE Literacy, teacher beliefs as recorded in BIPI, and student achievement in the nine subtests. While bivariate correlations do not indicate causality, they show an association between variables that can be interpreted in the context of the project.

Bivariate statistical analysis of BIPI results and SCOPE Literacy scores showed a positive association between the Section B composite score of the BIPI survey (that asks teachers to report a frequency of literacy-specific classroom practices) and SCOPE scores in all five dimensions. A bivariate analysis also found a positive association between the Section C composite score of the BIPI survey (that asks teachers to agree or disagree with a series of statements about teaching literacy) and SCOPE Literacy score in dimensions 1, 2 and 5. These results tell us that teachers who expressed opinions about teaching literacy that are consistent with the WSRP approach also had higher scores on the SCOPE dimensions. The association is statistically significant, although rather weak, with only SCOPE Dimension 4/BIPI Section B composite registering a Pearson correlation coefficient of above .3. The table below shows correlation coefficients.

Table 42. Correlations between SCOPE Literacy dimensions and BIPI composites

	SCOPE D1: Decoding	SCOPE Item D2: Vocabulary	SCOPE D3: Fluency	SCOPE D4: Comprehension	SCOPE D5: Writing
BIPI Section B composite	.197*	.188*	.179*	.324**	.256**
BIPI Section C composite	.229*	.184*	n/s	n/s	.186*

N/s not significant
* Statistically significant at p<.05 level (one-tail test)
** Statistically significant at p <.01 level (one-tail test)
*** Statistically significant at p <.001 level (one-tail test)

Bivariate statistical analysis of BIPI results and student achievement showed a somewhat stronger association between the self-reported frequency of literacy-related instructional practices, and student scores in all nine subtests. The Pearson correlation coefficient ranges between .180 (which is rather weak) and a moderate .306. The correlation analysis between EGRA subtests and the BIPI composite for Section C (teacher beliefs about literacy) did not show strong relationships: only four out of nine subtests were found to have any association with the Section C composite, and the association between those was rather weak. What these statistics tell us is that generally teachers who report implementing

best practices in teaching literacy (as captured by Section B of the BIPI survey) tend to have students who score higher on the EGRA. These correlations do not indicator causality; there can be a variety of explanations for these associations, including other factors, not captured in this study.

Table 43. Correlations between EGRA subtests and BIPI composites

	BIPI Section B Pearson Corr. Coef.	BIPI Section C Pearson Corr. Coef.
Letter naming	.254**	.180*
Letter sounds	.181*	n/s
Initial sound identification	.306**	n/s
Familiar word reading	.207*	.196*
Invented word decoding	.252**	n/s
Oral reading passage	.215*	.185*
Reading comprehension	.290**	.217*
Listening comprehension	.243*	n/s
Dictation	.291**	.233*

N/s not significant
* Statistically significant at p<.05 level (one-tail test)
** Statistically significant at p <.01 level (one-tail test)
*** Statistically significant at p <.001 level (one-tail test)

We used bivariate correlation analysis to test the hypotheses that increase in the BIPI scores might be associated with improvements in EGRA results. The analysis did not showed significant associations between the changes in BIPI scores and the changes in the EGRA scores.

The WSRP program is based on the research and field evidence that classroom instruction in key literacy components by teachers leads to improvements in literacy achievement by students. Although bivariate correlation analysis between improvements made by the WSRP teachers, and improvements on EGRA subtests did not find any significant associations, the analysis did show a strong overall positive association between all five SCOPE dimensions and student achievement on EGRA subtests (both measured at the posttest). The relationship was found to be robust: Pearson's r ranged between .3 and .4, which denotes strong association. That these results tell us is that teachers who display best instructional practices as measured by the SCOPE tend to have students who score higher on the EGRA.

While this association is not indicative of *causal* relationship between the SCOPE and the EGRA in this dataset, it does show that teachers who display better practices also have students who show better results. Of five SCOPE Literacy dimensions, the dimension that focused on explicit instruction in comprehension was found to be the most strongly associated with all nine EGRA subtests. The instruction in fluency dimension (SCOPE Literacy Dimension 3) was found to be strongly associated with letter sounds, initial sound identification, and dictation. Predictably, the instruction in writing dimension was found to be most strongly associated with student achievement in dictation. But curiously, the one dimension of SCOPE Literacy that explicitly focuses on vocabulary was found not be associated at all with either reading or listening comprehension. Finally, the instruction in decoding dimension was found to be rather strongly associated with the pre-literacy skills subtests (letter naming, letter sounds and

initial sound identification), as well as invented word reading, listening comprehension and dictation. The tables below show Person's correlation coefficients and associated significance level.

Table 44. Correlations between SCOPE Literacy dimensions and mean student achievement on EGRA subtests, at the posttest

	SCOPE D1: Decoding	SCOPE Item D2: Vocabulary	SCOPE D3: Fluency	SCOPE D4: Comprehension	SCOPE D5: Writing
Letter naming	.317**	.240*	.344**	.447**	.351**
Letter sounds	.393**	.296**	.450**	.447**	.330**
Initial sound identification	.384**	.287**	.415**	.505**	.369**
Familiar word reading	.258**	.235*	.340**	.468**	.293**
Invented word decoding	.329**	.226*	.319**	.465**	.348**
Oral reading passage	.235*	.247*	.313**	.461**	.321**
Reading comprehension	.281*	n/s	.275**	.433**	.287**
Listening comprehension	.344**	n/s	.330**	.431**	.317**
Dictation	.386**	.257*	.403**	.493**	.434**

* Statistically significant at p<.05 level (one-tail test)
** Statistically significant at p <.01 level (one-tail test)
*** Statistically significant at p <.001 level (one-tail test)

Comparisons between second and third grades show much stronger associations between the SCOPE and the EGRA scores at the second grade level. All correlations were found to be statistically significant, most of them with a very significant Pearson correlation coefficient of .4 or higher. More research is needed to understand why practices identified by the SCOPE associate stronger with the achievement at the second grade level than at the third grade level.

Table 45. Correlations between SCOPE Literacy dimensions and mean student achievement on EGRA subtests, at the posttest, Grade 2

	SCOPE D1: Decoding	SCOPE Item D2: Vocabulary	SCOPE D3: Fluency	SCOPE D4: Comprehension	SCOPE D5: Writing
Letter naming	.427**	.256*	.386**	.498***	.462***
Letter sounds	.503***	.401**	.500***	.583***	.425**
Initial sound identification	.537***	.445***	.557***	.666***	.513***
Familiar word reading	.493***	.354**	.458***	.611***	.467***
Invented word decoding	.441***	.333*	.395**	.552***	.435**
Oral reading passage	.476***	.346*	.438***	.589***	.470***
Reading comprehension	.459***	.289*	.458***	.532***	.400**
Listening comprehension	.452***	.266*	.438***	.459***	.434**
Dictation	.544***	.368**	.515***	.586***	.577***

* Statistically significant at p<.05 level (one-tail test)
** Statistically significant at p <.01 level (one-tail test)
*** Statistically significant at p <.001 level (one-tail test)

Table 46. Correlations between SCOPE Literacy dimensions and mean student achievement on EGRA subtests, at the posttest, Grade 3

	SCOPE D1: Decoding	SCOPE Item D2: Vocabulary	SCOPE D3: Fluency	SCOPE D4: Comprehension	SCOPE D5: Writing
Letter naming	.242*	.369**	.421**	.441***	.285*

Letter sounds	.269*	.192	.430***	.299*	.221
Initial sound identification	.138	.062	.240	.277*	.184
Familiar word reading	.105	.172	.353**	.339*	.207
Invented word decoding	.128	.196	.357**	.333*	.211
Oral reading passage	.116	.231	.355**	.375**	.255*
Reading comprehension	.167	.055	.208	.392**	.242
Listening comprehension	.259*	.113	.269*	.415**	.233
Dictation	.249*	.232	.371**	.426**	.339***

* Statistically significant at p<.05 level (one-tail test)
** Statistically significant at p <.01 level (one-tail test)
*** Statistically significant at p <.001 level (one-tail test)

The next two tables show correlations between EGRA subtests and SCOPE dimensions in intervention group and in the comparison group. More pairs of variables were found to be significantly correlated in the intervention group than in the comparison group.

Table 47. Correlations between SCOPE Literacy dimensions and mean student achievement on EGRA subtests, at the posttest, intervention group

	SCOPE D1: Decoding	SCOPE Item D2: Vocabulary	SCOPE D3: Fluency	SCOPE D4: Comprehension	SCOPE D5: Writing
Letter naming	.260*	.133	.404***	.456***	.352**
Letter sounds	.295*	.150	.381**	.368**	.367**
Initial sound identification	.233*	.002	.373**	.408***	.243*
Familiar word reading	.274*	.113	.373**	.452***	.315**
Invented word decoding	.310*	.159	.406***	.482***	.341**
Oral reading passage	.272*	.195	.380**	.486***	.367**
Reading comprehension	.372**	.121	.351**	.417***	.336**
Listening comprehension	.397***	.130	.359**	.364**	.285*
Dictation	.414***	.197	.453***	.462***	.457***

* Statistically significant at p<.05 level (one-tail test)
** Statistically significant at p <.01 level (one-tail test)
*** Statistically significant at p <.001 level (one-tail test)

Table 48. Correlations between SCOPE Literacy dimensions and mean student achievement on EGRA subtests, at the posttest, comparison group

	SCOPE D1: Decoding	SCOPE Item D2: Vocabulary	SCOPE D3: Fluency	SCOPE D4: Comprehension	SCOPE D5: Writing
Letter naming	.095	.029	-.006	.206	-.007
Letter sounds	.306*	.247	.314*	.346*	-.084
Initial sound identification	.242	.210	.218	.364*	.162
Familiar word reading	.080	.055	.112	.286*	.032
Invented word decoding	.074	.074	.076	.253	.027
Oral reading passage	.099	.045	.104	.295*	.050
Reading comprehension	.047	-.063	.006	.413**	-.008
Listening comprehension	.049	-.081	.017	.386**	.040
Dictation	.087	-.002	.061	.308*	.091

* Statistically significant at *p*<.05 level (one-tail test)
** Statistically significant at *p* <.01 level (one-tail test)
*** Statistically significant at *p* <.001 level (one-tail test)

At the total sample level, neither correlation nor regression analysis found statistically significant relationships between participation in the project and the changes in teacher beliefs, instructional practices, and student performance. The pattern of data also varied across grades and groups of schools which suggests that the relationships between the EGRA and SCOPE Literacy scores are mediated by other factors, unaccounted for in the present study. For example, when disaggregated by region, regression analysis showed that the intervention was effective in improving overall student achievement in second grade in ARMM (R^2 = .157) and in third grade in Region 9 (R^2 = .049)[17]. Regression analysis also found that the intervention had a statistically significant impact in improving student achievement in the second grade in Region 12, but the amount of impact was very small (R^2 = .005). Further research is needed to understand why the intervention had different effect across regions.

While the results of statistical analyses above are important and suggestive, further study will be required before definitive conclusions can be drawn concerning a causal relationship between teacher practice as measured by the SCOPE Literacy and student performance as measured by the EGRA. It may be that a common exogenous variable, such as the socio-economic milieu of particular schools, or additional teacher skills not measured by SCOPE, is driving both SCOPE Literacy and EGRA scores up. It is also possible that the instructional practices measured by SCOPE Literacy do not have direct linear relationships with the student performance as measured by the EGRA. Finally, one year of the program might not be sufficient to solidify the implementation of the practices in a way that has a strong bearing on student performance.

[17] Complete results of regression analysis are found in Annex E.

DISCUSSION AND CONCLUSIONS

The evaluation was designed to test whether the WSRP was effective in improving teacher instructional practices, teacher beliefs about literacy instruction, and student performance. The data presented in this report provided answers to the five evaluation questions stated in the Evaluation Methodology section of this report. This section provides a summary of the findings for each of the evaluation questions.

Question 1. In what ways did teachers' beliefs and attitudes on teaching reading change as a result of the intervention?

As the section on the BIPI findings described, statistical analyses of changes in BIPI survey responses between the pretest and the posttest showed that overall the intervention group teachers demonstrated larger positive change in all three BIPI sections, compared with the comparison group teacher results. For Section B, a comparison of means test showed a statistically significant difference in composite scores between the pretest and posttest. The change was significantly larger for the intervention group. For section C, a comparison of means test showed a significant positive change in composite scores between the pretest and the posttest. However, the difference in change in the intervention group and in the comparison group was not statistically significant. Section D was only analyzed descriptively at the dimension level, so no comparison of means test was conducted.

Question 2. Were the changes in beliefs associated with changes in instructional practices in teaching reading in English?

No statistically significant association between the changes in teacher beliefs and changes in instructional practices were found. However, bivariate statistical analysis of BIPI overall composite scores and SCOPE Literacy scores showed a positive association between Section B composite score of the BIPI survey (that asks teachers to report a frequency of literacy-specific classroom practices) and SCOPE Literacy scores in all five dimensions. A bivariate analysis also found a positive association between Section C composite score of the BIPI survey (that asks teachers to agree or disagree with a series of statements about teaching literacy) and SCOPE Literacy score in dimensions 1, 2 and 5. The association is statistically significant, although rather weak.

Question 3. Were the changes in teacher beliefs associated with students' reading skills?

Statistical analyses did not show an association between changes in the BIPI composite scores and improvements in student reading skills. However, bivariate statistical analysis showed a positive association between Section B BIPI composite and student achievement on all EGRA subtests. Section C BIPI composite was found to be positively associated with some, but not all EGRA subtests. The relationships were statistically significant, but not strong. Further study is needed to establish the conditions under which interventions can be result in effecting positive change in teacher beliefs and attitudes.

Question 4. Was there a change in teacher practices as a result of the intervention?

The WSRP teachers scored higher on four out of five SCOPE Literacy dimensions at the pretest, and higher on all five SCOPE dimensions at the posttest. Both the WSRP and comparison group teachers scored highest on the first dimension of SCOPE Literacy ("Provides students with structured opportunities to develop their encoding (spelling/writing) and decoding skills"), followed by the second, third and fourth dimensions. Both groups of teachers scored the lowest on the fifth dimension of SCOPE Literacy ("Implements instruction that recognizes the importance of independent, original writing in the development of reading skills"), although intervention group teachers demonstrated the highest gains in this dimension between the pretest and the posttest. The comparison of means showed larger gain in all five SCOPE Literacy dimensions among teachers in the intervention group ($p<.01$) compared with the teachers in the comparison group. The analysis by dimension showed larger improvement among intervention group teachers in three out of five SCOPE Literacy dimensions:

- Use diverse instructional strategies to develop students' reading fluency ($t = 2.10$; $p<.05$)
- Use diverse instructional strategies to develop students' comprehension skills ($t = 2.71$; $p<.01$)
- Implement instruction that recognizes the importance of independent, original writing in the development of reading skills ($t = 4.70$; $p<.001$)

Results of linear regression analysis showed that the project was effective in improving overall SCOPE score of teachers in both grades. For the second grade teachers, participation in the WSRP program was associated with an increase in the overall SCOPE score by 2.12 points (significant at $p<.05$ level). For the third grade teachers, participation in the WSRP program was associated with an increase in the overall SCOPE score by 2.32 points (significant at $p<.01$ level). The associated r-squared was found to be .135 for the second grade teachers, and .139 for the third grade teachers.

Question 5. Was there a significant improvement in the reading skills of students in grades 2 to 3 as a result of the intervention?

The overall results of EGRA testing showed relatively high pre-literacy and fluency skills, particularly among the third graders, and very low listening and reading comprehension skills. A lack of linear relationships between oral reading fluency and reading comprehension is observed in many countries where the instruction does not occur in a native language.

Second grade intervention group students gained significantly more between the pretest and the posttest in seven out of ten tested subtests, compared to just one subtest in which students from comparison group gained more. Comparing to the gains made by the students in the comparison group, intervention group second graders gained significantly more between the pretest and the posttest. In the third grade, students from the intervention group gain significantly more in three subtests, and students from the comparison group gained significantly more in two other subtests. The gain difference was particularly significant for female students. The gains made by the intervention group girls were larger and for more subtests than the gains made by the boys. In the second grade girls also outscored

boys in both pretest and the posttest. This pattern is also observed in the data from the third graders, although the difference between boys and girls is not as pronounced in some subtests.

Regression analysis also showed that the intervention was particularly effective in improving overall student achievement in second grade in ARMM (R^2 = .157) and in third grade in Region 9 (R^2 = .049). Regression analysis also found that the intervention had a statistically significant impact in improving student achievement in the second grade in Region 12, but the amount of impact was very small (R^2 = .005). Further research is needed to understand why the intervention had different effect across regions.

ANNEXES

ANNEX A. ANALYTICAL FRAMEWORK

INPUTS

Resources from Petron

Books and reference materials from BBF

DepED time and resources on project

OUTPUTS

Activities/Products

1. Teachers and Principals

- **5 days** summer institute for school heads and all teachers
- **4 days** refresher training

Products:

- Training session guides
- Modified SCOPE Literacy tool
- School Reading Improvement Plan that includes the following components:
  - Teacher and administrator training
  - Student assessment
  - Strengthening classroom reading instruction
  - Remedial and enrichment reading instruction
  - Instructional materials development
  - Monitoring and technical support

2. Students

- Classroom application of appropriate instructional approaches
- Activities for struggling readers
- Knowledge base: Books and reference materials for student in Reading and English

Participation

53 schools, 38,566 students:

- Improved reading instruction
- Increased time on reading tasks

OUTCOMES

All teachers and principals from the 45 selected schools are integrating the teaching of reading and writing in English into their subject-

Trained teachers are aware of their own skill levels and know effective strategies for improving reading and writing, which is necessary to strengthen their own reading and writing skills.

Principals and teachers are able to integrate their reading plans into their existing school improvement plans, and they follow their plans closely.

Students advance in their reading comprehension skills from baseline.

Students can understand grade-level text.

Students are able to read and demonstrate understanding as defined by a country curriculum, standards, or

Student achievement in reading in English

Teachers maintain good practices in teaching reading and

Students maintain reading gains.

DepED expands reading interventions to other schools

DepED applies reading assessment practices to other schools.

3. DepED Administrators

- Training on SCOPE Literacy administration and data analysis
- Workshop to prepare a refined

Product: Refined and scalable model for

20 division-level and district-level administrators enhance their skills in tracking improvement in

DepED at all levels is implementing EQuALLS2-initiated programs that further enhance teachers' capacity

ANNEX B: STUDY OF TEACHERS' CLASSROOM PRACTICES AND PERCEPTIONS WITH RESPECT TO READING AND WRITING (2012)

The EDC-developed Beliefs and Instructional Practices Inventory (BIPI) is designed to provide decision makers and professional development program planners with an overview of the types of evidence-based instructional practices teachers use in their daily work, as well insights into the beliefs that teachers hold about how children learn to read and write and about what they think constitute effective instructional practices.

Having information about teachers' perceptions of their instructional practices provides insights into the specific reading and writing skills or competencies that teachers are unlikely to incorporate into daily instruction -- either because they do not view students as being capable of mastering them, or because they do not consider the activity to be an important contributor to students' reading and writing development for the age level in question. This is an important indicator of teachers' perceptions of how reading and writing develops—and of the skills that can and should be developed at particular grade levels.

The BIPI also provides glimpses into the beliefs that teachers hold about how children learn to read and write, the relative difficulties boys and girls face learning to read and write, and effective reading and writing instructional strategies. Understanding the beliefs teachers bring to the reading and writing process is critical to designing an effective intervention program. Beliefs can act as pedagogical filters, encouraging teachers to assimilate strategies and activities that align with those belief structures and to either reject or distort those that do not. If teachers are presented with instructional materials and training that conflict with their own tacitly-held beliefs about how children learn to read they are unlikely to incorporate the new ideas into their instructional repertoire. They are unlikely to use the materials or activities at all, or to use them as intended, unless relevant and convincing evidence to the contrary.

The survey is a self-reported indirect measure that consists of a series of declarative statements about observable classroom practices or beliefs about how students learn. Each statement is either an evidence-based practice, or a practice that may in fact be detrimental to students' reading development. Teachers indicate the degree to which they agree or disagree, or the frequency with which they incorporate the practice.

The BIPI is administered with the written consent of the teacher, with the clear understanding that individual data is not shared with others, and with the assurance that it is not a test. The form may be administered individually or in groups, and may be administered orally if needed. Administrators may answer teachers' questions about the survey statements, but only in a way that does not influence their answers.

Responses are entered into an excel file for initial analysis. During analysis, different practices statements and their associated rationales are grouped into categories indicative of belief structures, in order to describe

1. teachers' own personal literacy practices and their training in reading instruction
2. teachers' beliefs about what contributes to effective reading instruction

3. the degree to which teachers integrate into their instructional program practices related to each of the components of an effective reading program (oral language development, explicit instruction of component skills, authentic writing and authentic reading)
4. teachers' expectations of students with respect to each of these four components

BELIEFS AND INSTRUCTIONAL PRACTICES INVENTORY (BIPI)

Education Development Center (EDC) is an international NGO that works to support literacy instruction in a number of countries including the Philippines. As an education development NGO, it is interested in gaining a better understanding of the process by which children in different countries learn to read.

The results will enable EDC to identify the aspects of reading instruction that are most challenging for teachers and students in each country, as well as those that do not seem to pose a great deal of difficulty. This will help EDC develop more responsive and effective training programs.

- You have been selected to participate in this study, but you have the right not to participate if you do not want to.
- Your participation will be anonymous. Your name will not be mentioned anywhere in the summary reports. Your responses will be combined with that of all other participants in your country and presented in the form of summary tables.
- The overall results of the study will, however, be shared with the EQuALLS2 Project and with the Department of Education in order to prepare future trainings and materials that respond better to teachers' expressed needs and priorities.
- If you agree to complete this questionnaire, we thank you in advance. You will be asked to identify the name of your community and provide certain characteristics of your school (the number of students in the class or school, the zone in which the school is situated (rural versus urban), the status of the school or learning center, …). However, we will never communicate the results by individual school. All responses will be grouped together and presented together.
- If you prefer not to complete this questionnaire, please return it now to an EDC staff.

I accept to complete this questionnaire according to the conditions outlined above.

Yes ☐ **No** ☐

Name:_____ Date: _____

A. General information Direction : Please provide information being asked for or circle one option as appropriate.

1.	School Name and District : _____
2.	Public Elementary School 1. Elementary School 2. Central Elementary School
3.	Professional status 1.Holder of DepEd regular/plantilla post 2.LGU-funded (MLGU, BLGU) 3. Community-recruited and paid teacher (PTA, other stakeholders) 4.Private school teacher 5.Volunteer
4.	Age: _____ years
5.	Number of years teaching experience : _____ years
6.	Sex 1. Male 2. Female
7.	What grade level do you teach at this year? 1 = grade 1 4 = grade 4 7 = combination 2 = grade 2 5 = grade 5 8 = multi-grade 3 = grade 3 6 = grade 6
8.	Where is your school located? 1. Rural 2. Urban
9.	What is the highest academic degree you have received? 1 = Bachelor's Degree or higher 3 = High school 2 = Technical/trade certificate 4 = Primary school leaving exam (A&E) 5= Other (specify) :_____
10.	e a license as a professional teacher? 1 = No 2 = Yes
11.	Have you attended any in-service training or professional development sessions such as workshops on how to teach reading in the last year? 2 = Yes *How many training days did you receive in total over the past year? ____ days*

B. How often do you do the following activities with your class? *(Put an X in the appropriate column.)*	Often (5 or more times a month)	Sometimes, but less than 5 times a month	Never	This is an inappropriate activity to do with students in my grade

B. How often do you do the following activities with your class? *(Put an X in the appropriate column.)*	Often (5 or more times a month)	Sometimes, but less than 5 times a month	Never	This is an inappropriate activity to do with students in my grade
12. Help students use their knowledge of sounds and letters to decode a new word				
13. Ask students to point out periods, commas, exclamation or question marks				
14. Ask students to try to guess or figure out the meaning of a new word by examining how it is used in a text or a sentence				
15. Show students how to try to figure out the meaning of a word by analysing the root word and the suffixes and/or prefixes				
16. Ask students to read out loud for you or for classmates				
17. Have students repeat after you the sentences of a text				
18. Have students discuss with classmates what they know about the theme or subject of a text before reading it				
19. Ask students to predict the content of a story by examining the title or the illustrations				
20. Have students identify the principal idea of a story or a text				
21. Ask students to tell you what happened in the beginning, middle or end of a story or text they have read				
22. Ask students to predict the next events of a story				
23. Ask students to identify what they liked about a story or a text				
24. Ask students to identify whether there are any similarities between the events in a story and their own life experiences				
25. Invite students to read texts or books they choose on their own				
26. Invite students to read texts or stories that are NOT in their textbook				
27. Ask students to write original texts or sentences (i.e. texts or sentences that they have composed themselves, without the support of a model)				
28. Ask students to write a sentence (or more) to summarize what they learned during the day or what they liked about the day				
29. Ask students to copy from the board texts prepared by the teacher				
30. Read stories to your students				
31. Ask students to use their textbooks, their word lists or posters in the classroom to check the spelling of new words				

B. How often do you do the following activities with your class? *(Put an X in the appropriate column.)*	Often (5 or more times a month)	Sometimes, but less than 5 times a month	Never	This is an inappropriate activity to do with students in my grade
32. Ask students to look over the text of a classmate to correct spelling, grammar or punctuation errors				
33. Ask students to complete reading assignments at home (as homework)				
34. Ask students to complete writing assignments at home (as homework)				
35. Invite students to tell a story to their classmates				
36. Help students memorize whole words by sight, without having to sound them out.				

C. Statements		Agree	Disagree	No opinion
37.	All learners can learn to read.			
38.	All learners can learn to write.			
39.	Students have a lot of difficulty learning to write			
40.	If I had sufficient reading material in my classroom, I would give students time each day to read freely materials of their own choosing			
41.	If a student makes an error spelling a word that he/she is attempting to write for the first time, it's not a major concern.			
42.	Students must be able to recite a text before they can read it.			
43.	It is better to teach reading and writing as two separate subjects, so as to not confuse the students.			
44.	One must learn to read before one can learn to write.			
45.	Students can't write an original text (ie, a sentence or short text they have composed themselves) until at least grade 3 or 4.			
46.	It is important to give students time each day to write freely on topics of their own choosing.			
47.	It is important to correct all the errors in sentences students produce.			
48.	Before having students read a text for the first time, it is important to have a discussion with them about what they know about the subject addressed in the text.			
49.	Reading stories to students helps them develop their reading skills			
50.	It is very difficult for students to learn to read.			
51.	It is very difficult for students to learn to write			
52.	Young students must memorize a text before they can understand it.			
53.	Learning to recite a text is a first step in learning how to read it.			
54.	Silent reading should be avoided, because the teacher can't check if students are actually reading or reading correctly.			
55.	A student who writes "well" is a student who does not make any grammatical or			

C. Statements		Agree	Disagree	No opinion
	spelling mistakes.			
56.	I have received adequate training on how to teach reading			
57.	I have received adequate training on how to teach writing			
58.	I often have opportunities to talk to colleagues about how to teach reading.			
59.	I often have opportunities to talk to colleagues about how to teach writing.			

D. Students' reading/writing skills		Before the start of Grade 1	By the end of Grade 2	By the end of Grade 4	By the end of Grade 6	Not an important skill
60.	Read out loud, and with few errors, a simple text (2 to 3 sentences) that they have never seen before					
61.	Understand texts they are reading					
62.	Write an original text of 2 or more sentences (one they have created themselves as opposed to a text they have copied from the board or created based on a model supplied by the teacher)					
63.	Review a classmate's text in order to help him/her correct spelling or grammar mistakes					
64.	Spell correctly common or frequently encountered words.					
65.	Use common punctuation (period, question mark, exclamation mark) correctly in their original productions					
66.	Infer or deduce the meaning of a new word by looking at how it is used in the sentence					
67.	Express their opinions on a text they have read					
68.	Read texts of their own choosing (ie, that they have chosen themselves)					
69.	Recognize all the letters of the alphabet and the sound each letter represents					
70.	Decode new words without the teachers' help by making correct letter-associations					
71.	Recognize and read common or frequently encountered words.					
72.	Make a hypothesis or a predication about what a text or story is about by looking at the title or the illustrations					
73.	Explain what they liked or didn't like about a story or text they have read					

D. Students' reading/writing skills		Before the start of Grade 1	By the end of Grade 2	By the end of Grade 4	By the end of Grade 6	Not an important skill
74.	Answer simple oral questions (where a text takes place, who are the main characters, when it takes place…) about a text they have read					
75.	Write all the letters of the alphabet independently (as opposed to copying letters from the board or from their textbook).					
76.	Write (and spell) simple words correctly (as opposed to copying simple words from the board or from a book)					
77.	Write simple sentences on their own (as opposed to copying sentences from the board or from a book)					
78.	Write answers to teacher questions about what they have read or a text that has been read to them.					

Annex C: SCOPE Literacy

I. Reading and Writing Instruction	5	4	3	2	1	REMARKS
1. Provides pupils/students with opportunities to develop their encoding (spelling and writing) and decoding skills (pronouncing and reading)						
2. Provides students with structured opportunities to increase their vocabulary						
3. Uses diverse instructional strategies to develop pupils'/students' comprehension skills						
4. Uses diverse instructional strategies to develop pupils'/students' reading fluency.						
5. Provides opportunities to pupils'/students to produce original text and help students learn from their mistakes						

Annex D. Early Grade Reading Assessment (EGRA)

The Early Grade Reading Assessment (EGRA) is a one-on-one oral assessment requiring about 15 minutes per child. It is a simple diagnostic of individual student progress in reading. The EGRA instrument typically is adapted for use in a particular country and language. A primary use of EGRA is to establish national or regional reading performance measures. The results then can feed into policy dialogue activities to inform education stakeholders of the current status of students' reading performance and to raise awareness about the importance of reading in the early grades.[18]

The EGRA instrument is designed to test literacy through a series of subtests. The EGRA was conceived to be a method-independent approach to assessment and thus can be used across a variety of languages and instructional approaches. EGRA intends to measure basic skills that a learner must in order to learn to read and understand the meaning of the text. The EGRA subtests are based on research on literacy and include five fundamental components: phonemic awareness, phonics, reading fluency, vocabulary, and comprehension. EGRA is adapted to the language(s) and locality where they are administered. The version of EGRA used for the evaluation of WSRP program was in English and included the following subtests

1. *Orientation to print* subtest assessed children's knowledge of how to read printed text. The children were asked to trace with the finger how they would read the text. The subtest had three items (the child puts finger on top row, left-most word; the child moves finger from left to right, and the child moves finger to left-most word of second line).
2. *Letter naming* subtest assessed children's knowledge of the letters of English alphabet. Children were presented with 100 randomly placed letters which they were instructed to name. Only letter names, not the sounds that those letters made, constituted correct answers. The test was timed at 60 seconds; the result of the test was a number of letters named correctly per minute. Since some children can finish the list in less than a minute, a number of letters per minute greater than 100 was possible.
3. *Letter sound* knowledge assessed children's knowledge of the letter-sound relationships critical for sounding out new words. In this timed subtask, children were shown another list of 100 random letters. Instead of providing the letter names, children were asked to tell the examiner the sound of as many letters as they could within 1 minute, yielding a score of correct letter sounds per minute.
4. *Initial* sound identification assessed children's phonemic awareness (the ability to explicitly identify and manipulate the sounds of language). Phonemic awareness has been found to be one of the most robust predictors of reading acquisition and is often used to identify children at risk for reading difficulties in the primary grades in developed countries. In this subtask, children were asked to listen to a word and identify the first sound in that word.

[18] https://www.eddataglobal.org/about/index.cfm

After two practice items, children were given 10 test items.

5. *Familiar word reading* assessed children's skill at reading high-frequency words. Recognizing familiar words is critical for developing reading fluency. In this timed subtask, children were presented a chart of 50 familiar words. Children were asked to read as many words as they could. The subtest was timed within 1minute and yielded a score of correct words per minute.
6. *Invented word decoding* assessed children's decoding skills to decode words they can't have memorized. Tested children were asked to decode a list of 50 pronounceable nonsensical words that followed legal spelling patterns of English. Children were asked to decode as many invented words as they could within 1 minute.
7. *Oral passage* reading assessed children's fluency in reading a passage of a simple text aloud and their ability to understand what they had read. The passage was 61-word long and children had one minute to read it.
8. *Reading comprehension:* After the children finished reading the oral reading passage, or the minute ended, the passage was removed and children were asked six questions about specific facts in the passage they just read. All question were inferential.
9. *Listening comprehension* is considered to be an important skill for reading comprehension. In this subtask, the test administrator read a passage to children. Children were then asked five questions about that passage.
10. *Dictation* assessed children's skill at spelling and basic writing rules, such as capitalization, punctuation, text direction, and spacing between words. The data collector read a short sentence to the children and children attempted to write the sentence. The data collector scored the dictation results after the child was finished with the test.

Administration of the EGRA includes an "early stop" rule, when the data collector stops the tasks if the child failed to complete the first few elements of the subtests (for instance, to read the first five words of the familiar word list).

Before administering the EGRA, the test administrators obtained consent of the children to participate in the exercise.

ANNEX E: RESULTS OF REGRESSION ANALYSIS

RESULTS OF REGRESSION ANALYSIS FOR THE TOTAL EGRA GAINS, BY REGION

Model Summary

region	Grade	Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
ARMM	second	1	.396[a]	.157	.154	11.09549
	third	1	.231[a]	.054	.051	11.64024
Region 9	second	1	.064[a]	.004	.002	11.18335
	third	1	.221[a]	.049	.047	9.60020
Region 12	second	1	.067[a]	.005	.003	11.97137
	third	1	.028[a]	.001	.000	10.55853

[a]. Predictors: (Constant), school type (comparison group = 0; intervention group = 1)

ANOVA[b]

region	Grade	Model		Sum of Squares	df	Mean Square	F	Sig.
ARMM	second	1	Regression	7038.902	1	7038.902	57.176	.000[a]
			Residual	37794.726	307	123.110		
			Total	44833.628	308			
	third	1	Regression	2712.388	1	2712.388	20.018	.000[a]
			Residual	47965.322	354	135.495		
			Total	50677.710	355			
Region 9	second	1	Regression	251.788	1	251.788	2.013	.157[a]
			Residual	61283.009	490	125.067		
			Total	61534.797	491			
	third	1	Regression	2541.632	1	2541.632	27.577	.000[a]
			Residual	49584.185	538	92.164		
			Total	52125.817	539			
Region 12	second	1	Regression	563.915	1	563.915	3.935	.048[a]
			Residual	124253.003	867	143.314		
			Total	124816.918	868			
	third	1	Regression	79.436	1	79.436	.713	.399[a]
			Residual	103595.259	929	111.483		
			Total	103674.695	930			

[a]. Predictors: (Constant), school type
[b]. Dependent Variable: average gain in ten EGRA subtests

Coefficients[a]

region	Grade	Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
				B	Std. Error	Beta		
ARMM	second	1	(Constant)	12.308	.883		13.943	.000
			school_type[b]	9.548	1.263	.396	7.561	.000
	third	1	(Constant)	15.676	.963		16.272	.000
			school_type	-5.612	1.254	-.231	-4.474	.000
Region 9	second	1	(Constant)	10.881	.759		14.333	.000
			school_type	1.441	1.015	.064	1.419	.157
	third	1	(Constant)	7.038	.700		10.052	.000
			school_type	4.554	.867	.221	5.251	.000
Region 12	second	1	(Constant)	13.459	.588		22.875	.000
			school_type	1.613	.813	.067	1.984	.048
	third	1	(Constant)	13.244	.532		24.898	.000
			school_type	.591	.700	.028	.844	.399

[a]. Dependent Variable: average gain in ten EGRA subtests

[b]. School type (comparison group = 0; intervention group = 1)

RESULTS OF REGRESSION ANALYSIS FOR THE TOTAL SCOPE GAINS

Model Summary

Grade	Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
second	1	.367[a]	.135	.114	2.76311
third	1	.373[a]	.139	.121	2.90467

[a]. Predictors: (Constant), School type (comparison group = 0; intervention group = 1)

ANOVA[b]

Grade	Model		Sum of Squares	df	Mean Square	F	Sig.
second	1	Regression	49.975	1	49.975	6.546	.014[a]
		Residual	320.661	42	7.635		
		Total	370.636	43			
third	1	Regression	62.872	1	62.872	7.452	.009[a]
		Residual	388.107	46	8.437		
		Total	450.979	47			

[a]. Predictors: (Constant), School type (comparison group = 0; intervention group = 1)

[b]. Dependent Variable: total SCOPE gains

Coefficients[a]							
Grade	Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
			B	Std. Error	Beta		
second	1	(Constant)	.368	.634		.581	.564
		type_school	2.152	.841	.367	2.558	.014
third	1	(Constant)	1.000	.650		1.540	.131
		type_school	2.321	.850	.373	2.730	.009

[a]. Dependent Variable: total SCOPE gains

ANNEX F. ADDITIONAL ANALYSES OF EGRA DATA

PRE-LITERACY SUBTESTS, GRADE 2

Table 49. Incorrect responses for EGRA pre-literacy skills subtests, Grade 2.

		ALL GRADE 2 STUDENTS		
		Pretest mean (St. Error)	Posttest mean (St. Error)	Gain score (St. Error)
Percent of letters named incorrectly	Intervention	3.9% (0.172)	3% (0.153)	-1% (0.175)
	Comparison	5.6%‡ (0.194)	4.7% (0.199)	-0.9% (0.215)
Percent of letters sounded incorrectly	Intervention	5.7% (0.182)	4.8% (0.19)	-0.9% (0.259)
	Comparison	6% (0.237)	5.8% (0.236)	-0.3% (0.29)

‡ The group's pretest mean score is statistically higher compared with the other group's score, at *p*<.01 level.
*The group's gain score is statistically significantly higher than the other group's at *p* <.05 level
**The group's gain score is statistically significantly higher than the other group's at *p* <.01 level
***The group's gain score is statistically significantly higher than the other group's at *p* <.001 level

Table 50.Incorrect responses for EGRA pre-literacy skills subtests, Grade 2, by gender.

Grade 2		GIRLS			BOYS		
		Pretest mean (St. Error)	Posttest mean (St. Error)	Gain score (St. Error)	Pretest mean (St. Error)	Posttest mean (St. Error)	Gain score (St. Error)
Percent of letters named incorrectly	Intervention	3.5% (0.237)	3% (0.256)	-0.5% (0.23)	4.4% (0.249)	2.9% (0.172)	-1.4% (0.261)
	Comparison	4.8%‡ (0.24)	4.3% (0.289)	-0.4% (0.289)	6.5%‡ (0.304)	5.1% (0.27)	-1.4% (0.317)
Percent of letters sounded incorrectly	Intervention	5.2% (0.208)	4.9% (0.305)	-0.3%* (0.376)	6.1% (0.295)	4.7% (0.231)	-1.4% (0.357)
	Comparison	4.5% (0.229)	5.3% (0.279)	0.8% (0.301)	7.7% (0.411)	6.3% (0.387)	-1.4% (0.502)

‡ The group's pretest mean score is statistically higher compared with the other group's score, at *p*<.01 level.
*The group's gain score is statistically significantly higher than the other group's at *p* <.05 level
**The group's gain score is statistically significantly higher than the other group's at *p* <.01 level
***The group's gain score is statistically significantly higher than the other group's at *p* <.001 level

Table 51. Distribution of frequencies for letter naming subtest, disaggregated by gender, for Grade 2.

Grade 2			Percent of letters named correctly						
			Zero	1 to 20%	21 to 40%	41 to 60%	61 to 80%	81 to 100%	TOTAL
Intervention	Girls	Pretest	1.8%	8.0%	21.4%	29.9%	29.9%	9.0%	100.0%
		Posttest	0%	2.1%	10.3%	16.8%	29.7%	41.1%	100.0%
	Boys	Pretest	5.8%	15.7%	24.6%	27.7%	15.2%	11.0%	100.0%
		Posttest	4.9%	2.9%	14.1%	25.6%	24.0%	28.5%	100.0%
Comparison	Girls	Pretest	12.2%	9.6%	29.5%	33.1%	9.8%	5.8%	100.0%
		Posttest	5.8%	9.4%	17.5%	22.5%	27.6%	17.3%	100.0%

	Boys	Pretest	7.3%	21.8%	25.4%	26.4%	16.1%	3.1%	100.0%
		Posttest	4.4%	12.2%	27.6%	22.9%	7.6%	25.3%	100.0%

Table 52. Distribution of frequencies for letter sounds subtest, disaggregated by gender, for Grade 2.

Grade 2			**Percent of correct letter sounds**						
			Zero	1 to 20%	21 to 40%	41 to 60%	61 to 80%	81 to 100%	TOTAL
Intervention	Girls	Pretest	3.2%	16.8%	51.7%	21.8%	4.1%	2.3%	100.0%
		Posttest	2.5%	7.6%	23.2%	41.6%	23.7%	1.4%	100.0%
	Boys	Pretest	6.3%	27.5%	44.7%	15.4%	2.7%	3.4%	100.0%
		Posttest	3.4%	13.5%	33.9%	40.8%	8.5%	0.0%	100.0%
Comparison	Girls	Pretest	23.8%	21.4%	39.7%	14.4%	0.0%	.7%	100.0%
		Posttest	16.6%	14.2%	40.9%	23.8%	1.7%	2.9%	100.0%
	Boys	Pretest	27.1%	24.5%	35.9%	12.5%	0.0%	0.0%	100.0%
		Posttest	14.8%	21.9%	30.5%	25.0%	6.3%	1.6%	100.0%

Table 53. Distribution of frequencies for initial sound identification subtest, disaggregated by gender, for Grade 2.

Grade 2			**Correct initial sound identification in 10 words**						
			Zero	1 to 2 words	2 to 4 words	4 to 6 words	6 to 8 words	8 to 10 words	TOTAL
Intervention	Girls	Pretest	4.6%	4.1%	2.8%	9.9%	18.4%	60.1%	100.0%
		Posttest	2.1%	1.8%	1.6%	3.9%	12.9%	77.7%	100.0%
	Boys	Pretest	10.3%	4.3%	8.5%	13.7%	16.6%	46.5%	100.0%
		Posttest	3.4%	0.2%	2.7%	6.5%	16.6%	70.6%	100.0%
Comparison	Girls	Pretest	25.8%	5.3%	6.3%	10.8%	13.5%	38.3%	100.0%
		Posttest	15.4%	5.3%	2.2%	6.7%	18.3%	52.2%	100.0%
	Boys	Pretest	39.8%	6.3%	6.3%	9.9%	20.6%	17.2%	100.0%
		Posttest	22.7%	2.1%	3.4%	2.6%	25.3%	44.0%	100.0%

PRE-LITERACY SUBTESTS, GRADE 3

Table 54. Incorrect responses for five EGRA subtest, Grade 3.

		ALL GRADE 3 STUDENTS		
		Pretest mean (St. Error)	Posttest mean (St. Error)	Gain score (St. Error)
Percent of letters named incorrectly	Intervention	3.1% (0.128)	2% (0.117)	-1.1% (0.151)
	Comparison	5.1%‡ (0.229)	3.7% (0.202)	-1.4% (0.202)
Percent of letters sounded incorrectly	Intervention	5.7% (0.14)	4.8% (0.152)	-0.9% (0.186)*

	Comparison	7%‡ (0.21)	5.3% (0.199)	-1.7% (0.274)

‡ The group's pretest mean score is statistically higher compared with the other group's score, at *p*<.01 level.
*The group's gain score is statistically significantly higher than the other group's at *p* <.05 level
**The group's gain score is statistically significantly higher than the other group's at p <.01 level
***The group's gain score is statistically significantly higher than the other group's at p <.001 level

Table 55. Incorrect responses for five EGRA subtest, Grade 3, by gender.

Grade 3		GIRLS			BOYS		
		Pretest mean (St. Error)	Posttest mean (St. Error)	Gain score (St. Error)	Pretest mean (St. Error)	Posttest mean (St. Error)	Gain score (St. Error)
Percent of letters named incorrectly	Intervention	2.4% (0.151)	1.3% (0.112)	-1.1% (0.135)	3.7%‡ (0.196)	2.6% (0.191)	-1.1% (0.254)
	Comparison	4.4%‡ (0.291)	2.8% (0.177)	-1.6% (0.282)	5.9% (0.355)	4.6% (0.373)	-1.3% (0.288)
Percent of letters sounded incorrectly	Intervention	5.7% (0.215)	4.4% (0.227)	-1.3%* (0.288)	5.8% (0.184)	5.1% (0.204)	-0.7% (0.241)
	Comparison	7.1%‡ (0.302)	4.7% (0.236)	-2.4% (0.393)	6.8% (0.292)	5.9% (0.326)	-0.9% (0.376)

‡ The group's pretest mean score is statistically higher compared with the other group's score, at *p*<.01 level.
*The group's gain score is statistically significantly higher than the other group's at *p* <.05 level
**The group's gain score is statistically significantly higher than the other group's at *p* <.01 level
***The group's gain score is statistically significantly higher than the other group's at *p* <.001 level

Table 56. Distribution of frequencies for letter naming subtest, disaggregated by gender, for Grade 3.

Grade 3			Percent of letters named correctly						
			Zero	1 to 20%	21 to 40%	41 to 60%	61 to 80%	81 to 100%	TOTAL
Intervention	Girls	Pretest	1.4%	2.2%	6.9%	29.8%	34.9%	24.9%	100.0%
		Posttest	0.0%	1.0%	4.0%	7.9%	22.1%	65.0%	100.0%
	Boys	Pretest	1.3%	4.4%	18.9%	37.0%	19.4%	19.0%	100.0%
		Posttest	1.0%	4.7%	2.2%	17.4%	33.4%	41.2%	100.0%
Comparison	Girls	Pretest	1.8%	5.5%	15.8%	23.7%	31.1%	22.1%	100.0%
		Posttest	0.0%	3.1%	11.8%	25.1%	19.9%	40.1%	100.0%
	Boys	Pretest	3.1%	10.5%	25.3%	30.6%	17.0%	13.6%	100.0%
		Posttest	.3%	4.9%	14.8%	25.9%	23.8%	30.2%	100.0%

Table 57. Distribution of frequencies for letter sounds subtest, disaggregated by gender, for Grade 3.

Grade 3			Percent of correct letter sounds						
			Zero	1 to 20%	21 to 40%	41 to 60%	61 to 80%	81 to 100%	TOTAL
Intervention	Girls	Pretest	2.2%	19.7%	51.9%	20.5%	2.8%	3.0%	100.0%
		Posttest	2.2%	5.7%	32.8%	39.1%	18.2%	2.0%	100.0%
	Boys	Pretest	5.7%	21.9%	58.0%	11.1%	1.2%	2.0%	100.0%
		Posttest	0.0%	15.0%	37.6%	39.5%	6.4%	1.5%	100.0%
Comparison	Girls	Pretest	15.3%	10.4%	48.3%	20.3%	0.0%	5.7%	100.0%

		Posttest	2.6%	10.1%	41.3%	35.8%	6.0%	4.2%	100.0%
	Boys	Pretest	15.5%	22.2%	51.6%	5.2%	0.0%	5.5%	100.0%
		Posttest	5.8%	21.2%	32.6%	35.5%	4.1%	.9%	100.0%

Table 58. Distribution of frequencies for initial sound identification subtest, disaggregated by gender, for Grade 3.

Grade 3			**Correct initial sound identification in 10 words**						
			Zero	1 to 2 words	2 to 4 words	4 to 6 words	6 to 8 words	8 to 10 words	TOTAL
Intervention	Girls	Pretest	3.0%	2.6%	5.7%	6.5%	19.6%	62.6%	100.0%
		Posttest	2.0%	0.0%	1.6%	1.0%	7.9%	87.5%	100.0%
	Boys	Pretest	8.6%	5.6%	8.4%	12.5%	20.9%	44.0%	100.0%
		Posttest	4.4%	0.0%	4.9%	3.5%	19.4%	67.8%	100.0%
Comparison	Girls	Pretest	16.1%	3.6%	6.5%	11.5%	19.0%	43.2%	100.0%
		Posttest	4.2%	1.8%	2.1%	13.8%	17.4%	60.7%	100.0%
	Boys	Pretest	28.0%	5.8%	9.0%	8.7%	21.3%	27.1%	100.0%
		Posttest	12.5%	4.6%	5.2%	7.5%	20.3%	49.9%	100.0%

FLUENCY SUBTESTS, GRADE 2

Table 59. Incorrect responses for EGRA fluency subtests, Grade 2.

		ALL GRADE 2 STUDENTS		
		Pretest mean (St. Error)	Posttest mean (St. Error)	Gain score (St. Error)
Percent of familiar words read incorrectly	Intervention	11.3% (0.315)	10.4% (0.299)	-0.9% (0.335)
	Comparison	10.2% (0.419)	10.8% (0.36)	0.5% (0.477)*
Percent of invented words decoded Incorrectly	Intervention	8.8% (0.346)	8.7% (0.309)	-0.1% (0.373)
	Comparison	7.6% (0.388)	7% (0.289)	-0.6% (0.439)
Percent of words read incorrectly in a passage	Intervention	8.1% (0.365) ǂ	6.1% (0.224)	-2% (0.378)
	Comparison	5.3% (0.294)	6.4% (0.272)	1.1% (0.38)***

ǂ The group's pretest mean score is statistically higher compared with the other group's score, at p<.001 level.
*The group's gain score is statistically significantly higher than the other group's at p <.05 level
**The group's gain score is statistically significantly higher than the other group's at p <.01 level
***The group's gain score is statistically significantly higher than the other group's at p <.001 level

Table 60. Incorrect responses for EGRA fluency subtests, Grade 2, by gender.

Grade 2		GIRLS			BOYS		
		Pretest mean (St. Error)	Posttest mean (St. Error)	Gain score (St. Error)	Pretest mean (St. Error)	Posttest mean (St. Error)	Gain score (St. Error)
Percent of familiar words read incorrectly	Intervention	11.5% (0.425)	10.4% (0.447)	-1.1% (0.512)	11.1% (0.463)	10.4% (0.399)	-0.7%* (0.436)
	Comparison	10.2% (0.566)	10.3% (0.537)	0.1% (0.75)	10.4% (0.62)	11.3% (0.473)	1% (0.572)
Percent of invented words decoded Incorrectly	Intervention	8.7% (0.447)	8.4% (0.438)	-0.3% (0.479)	8.8% (0.526)	9.0% (0.437)	0.1% (0.569)
	Comparison	6.9% (0.484)	7.8% (0.414)	0.9% (0.554)	8.4% (0.613)	6.2% (0.396)	-2.3%** (0.68)
Percent of words read incorrectly in a passage	Intervention	9.4%‡ (0.637)	5.9% (0.318)	-3.5%*** (0.665)	6.9% (0.359)	6.4%‡ (0.315)	-0.6%** (0.356)
	Comparison	5.7% (0.475)	6.6% (0.38)	1% (0.589)	5% (0.334)	6.2% (0.389)	1.2% (0.469)

‡ The group's pretest mean score is statistically higher compared with the other group's score, at $p<.001$ level.

*The group's gain score is statistically significantly higher than the other group's at $p<.05$ level

**The group's gain score is statistically significantly higher than the other group's at $p<.01$ level

***The group's gain score is statistically significantly higher than the other group's at $p<.001$ level

Table 61. Distribution of frequencies for familiar word reading subtest, disaggregated by gender, for Grade 2.

Grade 2			Percent of familiar words read correctly						
			Zero	1 to 20%	21 to 40%	41 to 60%	61 to 80%	81 to 100%	TOTAL
Intervention	Girls	Pretest	11.0%	4.6%	14.9%	17.4%	17.9%	34.2%	100.0%
		Posttest	.9%	2.1%	7.1%	14.7%	8.7%	66.4%	100.0%
	Boys	Pretest	20.9%	8.8%	14.8%	20.4%	8.5%	26.5%	100.0%
		Posttest	9.9%	5.8%	7.0%	13.7%	15.2%	48.4%	100.0%
Comparison	Girls	Pretest	34.5%	7.0%	11.8%	11.6%	16.6%	18.6%	100.0%
		Posttest	20.4%	3.1%	12.7%	16.1%	5.8%	41.8%	100.0%
	Boys	Pretest	40.2%	6.5%	14.1%	13.6%	13.6%	12.0%	100.0%
		Posttest	24.0%	3.4%	12.8%	15.4%	8.9%	35.5%	100.0%

Table 62. Distribution of frequencies for invented words decoding subtest, disaggregated by gender, for Grade 2.

Grade 2			Percent of invented words decoded correctly						
			Zero	1 to 20%	21 to 40%	41 to 60%	61 to 80%	81 to 100%	TOTAL
Intervention	Girls	Pretest	12.4%	9.2%	6.2%	18.9%	28.5%	24.8%	100.0%
		Posttest	3.2%	1.1%	7.8%	11.5%	17.7%	58.7%	100.0%
	Boys	Pretest	26.0%	5.2%	17.9%	16.4%	17.3%	17.3%	100.0%
		Posttest	11.0%	4.7%	11.9%	18.7%	14.4%	39.3%	100.0%

Comparison	Girls	Pretest	42.9%	4.3%	6.3%	12.0%	17.6%	16.9%	100.0%
		Posttest	21.6%	6.3%	6.7%	10.8%	12.7%	41.8%	100.0%
	Boys	Pretest	45.9%	2.3%	7.0%	17.6%	9.8%	17.4%	100.0%
		Posttest	29.8%	2.3%	10.2%	10.7%	7.0%	39.9%	100.0%

Table 63. Distribution of frequencies for oral passage reading subtest, disaggregated by gender, for Grade 2.

Grade 2			**Percent of words read correctly in an oral passage**						
			Zero	1 to 20%	21 to 40%	41 to 60%	61 to 80%	81 to 100%	TOTAL
Intervention	Girls	Pretest	16.7%	5.5%	13.8%	13.5%	11.5%	39.0%	100.0%
		Posttest	6.7%	2.1%	7.3%	8.7%	11.7%	63.5%	100.0%
	Boys	Pretest	27.0%	7.4%	12.1%	20.7%	10.1%	22.7%	100.0%
		Posttest	11.9%	4.7%	9.7%	16.0%	7.6%	50.1%	100.0%
Comparison	Girls	Pretest	46.4%	3.1%	5.8%	8.2%	9.9%	26.7%	100.0%
		Posttest	23.6%	3.1%	13.7%	10.1%	5.0%	44.5%	100.0%
	Boys	Pretest	53.8%	4.2%	3.9%	13.0%	10.4%	14.8%	100.0%
		Posttest	30.6%	3.6%	11.4%	12.7%	8.1%	33.5%	100.0%

FLUENCY SUBTESTS, GRADE 3

Table 64. Incorrect responses for EGRA fluency subtests, Grade 3.

		GRADE 3 STUDENTS		
		Pretest mean (St. Error)	Posttest mean (St. Error)	Gain score (St. Error)
Percent of familiar words read incorrectly	Intervention	10.5% (0.254)	9.2% (0.253)	-1.3% (0.272)
	Comparison	12.1%‡ (0.409)	10.4% (0.371)	-1.8% (0.359)
Percent of invented words decoded Incorrectly	Intervention	9.4% (0.273)	8.1% (0.268)	-1.3% (0.306)**
	Comparison	10.6% (0.423)	7.8% (0.328)	-2.8% (0.38)
Percent of words read incorrectly in a passage	Intervention	6.6% (0.209)	4.6% (0.174)	-2.1% (0.212)
	Comparison	6.2% (0.286)	5% (0.246)	-1.1% (0.311)*

‡ The group's pretest mean score is statistically higher compared with the other group's score, at $p<.01$ level.
*The group's gain score is statistically significantly higher than the other group's at $p<.05$ level
**The group's gain score is statistically significantly higher than the other group's at $p<.01$ level
***The group's gain score is statistically significantly higher than the other group's at $p<.001$ level

Table 65. Incorrect responses for five EGRA subtest, Grade 3, by gender.

Grade 3		GIRLS			BOYS		
		Pretest mean (St. Error)	Posttest mean (St. Error)	Gain score (St. Error)	Pretest mean (St. Error)	Posttest mean (St. Error)	Gain score (St. Error)
Percent of familiar words read incorrectly	Intervention	10.3% (0.412)	7.7% (0.335)	-2.6% (0.4)	10.7% (0.314)	10.4% (0.364)	-0.2% (0.366)
	Comparison	12% (0.552)	8.2% (0.447)	-3.8% (0.472)	12.3% (0.609)	12.8% (0.58)	0.5% (0.522)
Percent of invented words decoded Incorrectly	Intervention	8.8% (0.405)	7.9% (0.421)	-0.8% (0.494)	10% (0.369)	8.3% (0.344)	-1.7% (0.379)
	Comparison	10.6% (0.518)	7.9% (0.43)	-2.7%** (0.487)	10.6% (0.684)	7.7% (0.502)	-2.9% (0.592)
Percent of words read incorrectly in a passage	Intervention	5.9% (0.331)	3.8% (0.252)	-2% (0.364)	7.2% (0.262)	5.2% (0.238)	-2.1% (0.241)
	Comparison	5.4% (0.366)	4.1% (0.292)	-1.3% (0.371)	7% (0.443)	6.1% (0.399)	-0.9%* (0.513)

‡ The group's pretest mean score is statistically higher compared with the other group's score, at *p*<.001 level.

*The group's gain score is statistically significantly higher than the other group's at *p* <.05 level

**The group's gain score is statistically significantly higher than the other group's at *p* <.01 level

***The group's gain score is statistically significantly higher than the other group's at *p* <.001 level

Table 66. Distribution of frequencies for familiar word reading subtest, disaggregated by gender, for Grade 3.

Grade 3			Percent of familiar words read correctly						
			Zero	1 to 20%	21 to 40%	41 to 60%	61 to 80%	81 to 100%	TOTAL
Intervention	Girls	Pretest	5.5%	0.0%	2.8%	9.7%	19.6%	62.5%	100.0%
		Posttest	1.4%	2.6%	0.0%	4.0%	10.1%	82.0%	100.0%
	Boys	Pretest	11.6%	1.5%	17.9%	16.7%	7.6%	44.7%	100.0%
		Posttest	2.9%	2.7%	6.0%	10.4%	16.7%	61.4%	100.0%
Comparison	Girls	Pretest	14.3%	3.6%	9.4%	7.3%	12.0%	53.4%	100.0%
		Posttest	10.7%	1.0%	4.2%	7.6%	4.5%	72.0%	100.0%
	Boys	Pretest	19.5%	9.3%	7.3%	14.0%	14.2%	35.8%	100.0%
		Posttest	9.9%	4.4%	9.9%	8.7%	8.4%	58.7%	100.0%

Table 67. Distribution of frequencies for invented words decoding subtest, disaggregated by gender, for Grade 3.

Grade 3			Percent of invented words decoded correctly						
			Zero	1 to 20%	21 to 40%	41 to 60%	61 to 80%	81 to 100%	TOTAL
Intervention	Girls	Pretest	7.3%	0.8%	2.6%	9.3%	19.9%	60.2%	100.0%
		Posttest	3.2%	0.0%	1.8%	2.0%	9.3%	83.8%	100.0%
	Boys	Pretest	9.3%	6.6%	13.2%	18.4%	18.0%	34.6%	100.0%
		Posttest	5.1%	0.0%	7.8%	15.3%	14.6%	57.1%	100.0%

Comparison	Girls	Pretest	17.4%	1.0%	8.3%	9.6%	11.2%	52.3%	100.0%
		Posttest	12.0%	1.0%	1.8%	6.3%	17.2%	61.7%	100.0%
	Boys	Pretest	25.9%	4.9%	7.8%	11.6%	16.6%	33.1%	100.0%
		Posttest	17.4%	0.0%	5.8%	8.1%	21.2%	47.4%	100.0%

Table 68. Distribution of frequencies for oral passage reading subtest, disaggregated by gender, for Grade 3.

Grade 3			**Percent of invented words decoded correctly**						
			Zero	1 to 20%	21 to 40%	41 to 60%	61 to 80%	81 to 100%	TOTAL
Intervention	Girls	Pretest	6.5%	0.0%	5.9%	3.8%	13.4%	70.4%	100.0%
		Posttest	2.6%	0.0%	1.8%	2.4%	7.7%	85.6%	100.0%
	Boys	Pretest	11.6%	6.7%	10.5%	15.5%	5.6%	50.1%	100.0%
		Posttest	6.7%	0.7%	7.6%	8.6%	9.9%	66.4%	100.0%
Comparison	Girls	Pretest	23.0%	0.0%	2.6%	11.7%	7.6%	55.1%	100.0%
		Posttest	13.6%	0.0%	2.9%	5.0%	6.8%	71.8%	100.0%
	Boys	Pretest	26.5%	4.1%	8.1%	8.4%	11.6%	41.3%	100.0%
		Posttest	15.4%	0.0%	11.6%	4.7%	7.8%	60.5%	100.0%

COMPREHENSION AND WRITING SUBTESTS, GRADE 2

Table 69. Distribution of frequencies for oral passage reading comprehension subtest, disaggregated by gender, for Grade 2.

Grade 2			**Number of reading comprehension questions answered correctly**							
			Zero	One	Two	Three	Four	Five	Six	Total
Intervention	Girls	Pretest	64.7%	11.3%	12.2%	4.1%	3.0%	4.6%	0.0%	100.0%
		Posttest	49.5%	10.8%	12.7%	15.4%	4.8%	3.0%	3.7%	100.0%
	Boys	Pretest	83.4%	8.7%	3.4%	1.8%	2.7%	0.0%	0.0%	100.0%
		Posttest	62.2%	17.0%	10.1%	4.7%	2.7%	1.6%	1.8%	100.0%
Comparison	Girls	Pretest	83.4%	9.9%	1.0%	2.4%	1.7%	1.7%	0.0%	100.0%
		Posttest	67.1%	17.8%	6.3%	6.5%	2.4%	0.0%	0.0%	100.0%
	Boys	Pretest	94.5%	2.9%	2.6%	0.0%	0.0%	0.0%	0.0%	100.0%
		Posttest	82.3%	5.7%	10.2%	.8%	0.0%	1.0%	0.0%	100.0%

Table 70. Distribution of frequencies for listening comprehension subtest, disaggregated by gender, for Grade 2.

Grade 2	**Number of listening comprehension questions answered correctly**

			Zero	One	Two	Three	Four	Five	TOTAL
Intervention	Girls	Pretest	69.5%	15.4%	7.8%	4.1%	2.3%	0.9%	100.0%
		Posttest	46.0%	24.6%	18.9%	5.3%	1.4%	3.9%	100.0%
	Boys	Pretest	74.0%	18.8%	3.6%	2.5%	0.0%	1.1%	100.0%
		Posttest	52.3%	25.9%	13.1%	4.7%	1.4%	2.7%	100.0%
Comparison	Girls	Pretest	82.0%	11.5%	6.5%	0.0%	0.0%	0.0%	100.0%
		Posttest	71.6%	18.5%	8.9%	1.0%	0.0%	0.0%	100.0%
	Boys	Pretest	86.8%	10.9%	2.3%	0.0%	0.0%	0.0%	100.0%
		Posttest	80.5%	12.8%	5.5%	1.3%	0.0%	0.0%	100.0%

Table 71. Distribution of frequencies for dictation subtest, disaggregated by gender, for Grade 2

Grade 2			**Percent of dictation points**					
			Zero	25% or less	25-50%	50-75%	75-100%	TOTAL
Intervention	Girls	Pretest	27.8%	20.7%	34.5%	13.1%	3.9%	100.0%
		Posttest	8.0%	10.8%	31.3%	20.2%	29.7%	100.0%
	Boys	Pretest	39.2%	23.5%	24.2%	13.0%	0.0%	100.0%
		Posttest	18.2%	19.3%	29.8%	23.5%	9.2%	100.0%
Comparison	Girls	Pretest	41.0%	30.9%	23.5%	1.7%	2.9%	100.0%
		Posttest	16.1%	32.2%	25.0%	21.4%	5.3%	100.0%
	Boys	Pretest	57.8%	27.3%	13.3%	1.6%	0.0%	100.0%
		Posttest	35.4%	28.4%	19.3%	16.1%	0.8%	100.0%

COMPREHENSION AND WRITING SUBTESTS, GRADE 3

Table 72. Distribution of frequencies for oral passage reading comprehension subtest, disaggregated by gender, for Grade 3.

Grade 3			**Number of reading comprehension questions answered correctly**							
			Zero	One	Two	Three	Four	Five	Six	Total
Intervention	Girls	Pretest	46.4%	15.0%	11.2%	14.8%	4.7%	5.9%	2.0%	100.0%
		Posttest	28.7%	19.4%	15.0%	16.0%	12.9%	6.9%	1.0%	100.0%
	Boys	Pretest	63.9%	17.6%	8.6%	1.2%	5.4%	3.2%	0.2%	100.0%
		Posttest	53.6%	18.4%	8.6%	4.2%	7.1%	7.4%	0.7%	100.0%
Comparison	Girls	Pretest	66.2%	12.2%	6.2%	5.2%	6.2%	3.9%	0.0%	100.0%
		Posttest	37.3%	16.2%	9.9%	14.1%	11.0%	7.3%	4.2%	100.0%
	Boys	Pretest	73.6%	10.4%	6.4%	2.6%	3.2%	3.8%	0.0%	100.0%
		Posttest	56.1%	13.7%	14.0%	7.8%	1.5%	7.0%	0.0%	100.0%

Table 73. Distribution of frequencies for listening comprehension subtest, disaggregated by gender, for Grade 3

Grade 3			Number of listening comprehension questions answered correctly						
			Zero	One	Two	Three	Four	Five	TOTAL
Intervention	Girls	Pretest	58.0%	23.9%	6.5%	9.1%	2.6%	0.0%	100.0%
		Posttest	47.7%	18.5%	17.0%	9.1%	2.0%	5.7%	100.0%
	Boys	Pretest	63.6%	25.3%	8.1%	1.5%	1.5%	0.0%	100.0%
		Posttest	54.9%	25.5%	10.6%	6.8%	0.5%	1.7%	100.0%
Comparison	Girls	Pretest	70.5%	19.3%	4.2%	5.0%	1.0%	0.0%	100.0%
		Posttest	51.9%	26.8%	8.3%	8.6%	2.1%	2.3%	100.0%
	Boys	Pretest	70.6%	15.7%	10.8%	2.9%	0.0%	0.0%	100.0%
		Posttest	63.4%	14.8%	15.4%	3.5%	1.5%	1.5%	100.0%

Table 74. Distribution of frequencies for dictation subtest, disaggregated by gender, for Grade 3

Grade 3			Percent of dictation points					
			Zero	25% or less	25-50%	50-75%	75-100%	TOTAL
Intervention	Girls	Pretest	8.9%	15.8%	28.4%	35.5%	11.4%	100.0%
		Posttest	2.8%	6.7%	26.3%	29.2%	35.0%	100.0%
	Boys	Pretest	24.3%	28.8%	20.9%	23.1%	2.9%	100.0%
		Posttest	2.7%	18.6%	30.6%	35.6%	12.5%	100.0%
Comparison	Girls	Pretest	25.0%	22.4%	30.7%	16.7%	5.2%	100.0%
		Posttest	7.0%	20.6%	22.5%	30.3%	19.6%	100.0%
	Boys	Pretest	26.2%	29.4%	20.3%	19.2%	4.9%	100.0%
		Posttest	17.4%	13.7%	33.1%	19.8%	16.0%	100.0%