The Rate of Reading Poverty After the COVID-19 Pandemic School Shutdown and Specific Intervention Strategies for Lower Primary School Pupils in the Southern Province and Western Area of Sierra Leone

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Abstract—The study investigates the rate of reading poverty after the COVID-19 pandemic school shutdown and specific intervention strategies for lower primary school pupils in the southern province and western area of Sierra Leone. Randomised experiments of mixed-methods reading interventions for 100 struggling readers in class 5 and 20 English teachers selected from 10 primary schools (5 in the south and 5 in the Western Area) were carried out. The rate of reading poverty and proficiency was first determined in the selected classes using the *Access Center* method of reading assessment. Two intervention strategies were administered, and the scores for each intervention strategy were measured and compared. The findings reveal that over 70% of the pupils tested in reading in the south mispronounced or skipped five or more words when reading. The overall scores for pupils in the Western Area were relatively lower (a majority scoring less than 30%). The READ 180 reading intervention strategy is recommended to be introduced as the preferred teaching method at the pre-primary and primary school levels in Sierra Leone because of its proven potentiality to increase reading proficiency more than the popular Direct-teaching Model.

Index Terms—reading-poverty, proficiency, intervention strategies, learning inability, school shutdown

I. INTRODUCTION

Reading poverty, otherwise called learning poverty, is the inability of young learners aged ten or lower to read and comprehend simple texts or stories (World Bank, 2019). Because reading is key in formal education in literate societies worldwide, educationists such as Sénéchal et al. (2017) believe a school's first task is to ensure that the child can read efficiently. However, studies have shown that most children in third world countries in Africa and Latin America have not acquired this skill to an acceptable level, which has hindered learners' reading ability in later life (World Bank, 2019; Kim et al., 2020). The World Bank's database estimates that 53% of children in the third world or low-income countries and 80% in poor countries cannot read and understand a simple story (World Bank, 2019). Kessler (2020) revealed that more than 200 million children and youth in the world were out of school for the 2018 school year, with a total of 59 million of primary school age.

Kuhfeld et al. (2020) measured that students who lacked consistent instructions during the coronavirus school shutdown might retain only 70% of their annual reading gains. Consequently, achieving the development goals, mainly that of the SDG4 - to ensure inclusive and equitable quality education - for most African countries is gravely threatened (World Bank, 2019; Sachs et al., 2021). Reading proficiency is still not achieved in Latin American countries like Brazil, whose education system has been upgraded. This is worse in African countries, where little strides have been made to address the situation. In Malawi, for instance, primary schools teachers frequently come to school late or do not come to school at all (Ravishankar et al., 2016). The World Bank's measurement criterion of tallying children with reading poverty in school and the proportion of children out of school has made countries like Egypt reduce their reading poverty by half through the Progress in International Reading Literacy Study (PIRLS) (World Bank, 2019).

Though Sierra Leone introduced free and quality education at the lower schools three years ago, achieving quality seems slow. The *Multiple Indicator Cluster Survey Round 6* of Statistics Sierra Leone (2017) revealed that 84% of children in Sierra Leone could not read a simple story.

The study assessed the reading proficiency rate and reading poverty in selected schools in western and southern Sierra Leone after the COVID-19 school shutdown and determined the reading rate after the READ 180 reading-intervention strategy.

A. Reading Proficiency versus Reading Poverty

Determining students' reading proficiency, vis-à-vis reading poverty, has resulted in a range of assessment approaches. Missall et al. (2019) discovered that teachers rate students' proficiency in reading by determining their high level of reading accuracy, which they use to identify students at risk of reading poverty. Hackling et al., (2019) paired reading proficiency and vocabulary size and found out that even at a higher level of learning, the number of vocabularies college students amass is not sufficient to prepare them to read at an advanced level. Though many scholars have shown listening as integral to improving reading proficiency, Tschirner (2016) states that besides students studying Chinese, Russian and other foreign languages, a disconnect between listening and reading proficiencies does not necessarily determine low reading proficiency. However, studies such as those done by Hackling et al. (2019); Zhang and Zhang (2020) revealed a strong correlation between L2 vocabulary knowledge and L2 reading proficiency. Chang and Gu (2018) showed that both Fundamental Motor Skills (FMS) and Executive Function (EF) were significantly related to children's reading proficiency. The World Bank (2019) used its measurement indicators to determine pupils with reading difficulties and those who are out of school and are unable to read. Similarly, Statistics Sierra Leone (2017) used the Multiple Indicator Cluster Survey- Round 6 to determine children in Sierra Leone who cannot read a simple story.

B. Suggested Causes of Reading Poverty

The children's learning process has been an essential subject for educationists worldwide. Equally important are concerns over the growing reading poverty among children aged 10. While literature agrees that most young learners in Latin America and Africa cannot read a simple text, various reasons have been forwarded for this deficiency. Toste et al. (2017) state that not recognising words is the most severe source of reading challenges for students with learning disabilities (LD). Kilpatrick (2018) argues that having problems with reading contributes to phonological skill deficits.

Notwithstanding, Aliakbari and Amoli (2016) discovered that teacher-commitment and mastering close relationships with pupils had positive potential. In contrast, avoidance of work was found to be negative. Shumba and Gada (2018) proffered insufficient reading materials, in-service teacher-training, word recognition, and comprehension skills as significant causes of reading deficiency at the lower grades. Other scholars like Protopapas and Parrila (2018) have discovered dyslexia as another cause for reading difficulty in children.

C. Suggested Interventions to Improve Reading Deficiencies among Students

Suggested interventions to improve reading deficiencies among students are vast and varied. Using a standardised measure of mixed-methods to estimate early adolescent Latino English learners' word reading and vocabulary knowledge, Lesaux and Harris (2017) discovered that participants' word reading skills, vocabulary knowledge, comprehension processes, and paraphrasing sentences improved. However, reading comprehension processes did not improve much. Rasinski et al.'s (2017) instructional Fluency Development Lesson of clinicians' pre-and post-tests revealed that most of the students, unable to read well during the summer, made significant reading progress after the training. Kim et al. (2010) used word study activities, independent and modelled reading practice, and teacher-directed learning to improve the reading proficiencies of young learners. Similarly, the *Access Center* (2005) assessed learners' letter knowledge, ability to manipulate sounds in words, ability to read words in connected texts, and comprehension.

II. RESEARCH METHOD

Randomised experiments of mixed-methods reading interventions for 100 struggling readers in class 5 and 20 English teachers, selected from 10 primary schools (5 in the south and 5 in the western area of Sierra Leone), were carried out. The reading poverty and proficiency rates were first determined in the selected class using the *Access Center* (2005) method of reading assessment by testing pupils' abilities to separate and categorise letters by uppercase and lowercase. They were also made to break spoken words into parts or blend spoken parts into one word. They also read a passage of text as clearly and correctly as possible (the researcher recorded any mistakes that the student made), read a passage aloud for one minute (counting only the number of correct words read and that total equalled a pupil's oral reading fluency rate), and read a passage and answered factual questions about the text.

Pupils with reading-difficulties discovered in the classes were subjected to the READ 180 reading-intervention strategy adopted from Kim et al. (2010) to determine if it can be more related to improve reading proficiency than the Direct-teaching Model (DM), observed to be the popular model among teachers in primary schools in Sierra Leone. This intervention strategy was implemented two days per week over four weeks. Pre- and post-test scores were compared. Interviews were conducted to determine external factors like teacher commitment and incentives, teacher

qualification and in-service training, classroom/school environment, and teaching materials (see Table 11 for the question guides).

III. RESULTS AND DISCUSSION

A. Results

The results of this study were divided into two subsections, i.e. 1) Assess the rate of reading proficiency and poverty after the COVID – 19 school shutdowns and 2) Determine the reading rate after the READ 180 reading intervention strategy to suggest its effectiveness to improve the reading deficiencies among students.

Objective 1: Assess the rate of reading proficiency and poverty after the COVID – 19 school shutdowns

Results obtained from assessing pupils' ability to identify the alphabet, shown in Table 1, reveal that almost all of the pupils tested in the schools surveyed could separate and categorise upper-case and lowercase letters. Only pupils from School 1 in the south fell below 50%.

TABLE 1
TEST 1: SEPARATING AND CATEGORISING LETTERS BY UPPERCASE AND LOWERCASE ($N = 100$)

Letter Case	Southern Province				Western Area			
School Number	Upper Case	%	Lower Case	%	Upper Case	%	Lower Case	%
School 1	4	40	4	40	10	100	8	80
School 2	4	40	6	60	9	90	9	90
School 3	5	50	5	50	10	100	10	100
School 4	7	70	7	70	8	80	7	70
School 5	8	80	8	80	10	100	10	100
Overall	**5.6**	**56**	**6.0**	**60**	**9.4**	**94**	**8.8**	**88**

Table 2 shows that very few pupils could blend broken parts of a word into one word. This is revealing in two ways: First, more than 50% of the pupils could not join speech sounds together to form words mentally. Second, critical phonemic skills may have been left out for these pupils to continue to progress in reading.

TABLE 2
TEST 1: BLEND BROKEN PARTS OF A WORD INTO ONE WORD ($N = 100$)

School Number	Sample Size	Southern Province		Western Area	
		Average number of parts blended into words	%	Average number of parts blended into words	%
1	10	1	10	3	30
2	10	1	10	4	40
3	10	2	20	4	40
4	10	3	30	4	40
5	10	3	30	4	40
Overall	**50**	**2**	**20**	**3.8**	**38**

Table 3 reveals that 78% of the pupils in one of the schools in the Southern Province mispronounced or skipped five or more words in the reading test. The pupils' performances in the Western Area were relatively better, with an average of 21.4% of the pupils mispronouncing or skipping five or more words in the reading test (see Tables 3).

TABLE 3
TEST 1: RECORDED READING MISTAKES MADE BY PUPILS ($N = 100$)

School Number	Southern Province		Western Area	
	Average number of words mispronounced or skipped	%	Average number of words mispronounced or skipped	%
1	15.6	78	5.3	26.5
2	13.0	65	4.7	23.5
3	8.2	41	4.0	20.0
4	8.8	44	3.8	19.0
5	4.2	21	3.6	18.0
Overall	**9.96**	**49.8**	**4.28**	**21.4**

Table 4 shows that most pupils in Schools 1 and 2 in the Southern Province could not read 50% of a text of 20 words given to them. Notably, pupils in schools in the Western Area and School 5 in the south were unexpectedly exceptional.

TABLE 4
TEST 1: THE NUMBER OF WORDS READ CORRECTLY BY PUPILS (*N* = 100)

| School Number | Southern Province | | Western Area | |
	Average Number of Words Read Correctly	%	Average Number of Words Read Correctly	%
1	4.4	22	14.7	73.5
2	7.0	35	15.3	76.5
3	11.8	59	16.0	80.0
4	11.2	56	16.2	81.0
5	16.0	80	16.4	82.0
Overall	**10.1**	**50.4**	**15.7**	**78.6**

All pupils in the south scored below 30% when answering questions from the passage and fewer pupils in the Western Area scored above 60% (see Table 5).

TABLE 5
TEST 1: RESPONSES OF PUPILS TO QUESTIONS FROM THE PASSAGE (N = 100)

| Question | Correct Answer | Southern Province | | Western Area | |
		Number of Correct Answers	%	Number of Correct Answers	%
How many sons did the farmer have?	The farmer had two sons.	3	6	24	48
What were the names of the farmer's sons?	The names of the farmer's sons were Momoh and Sorie.	4	8	20	40
Who lived along the road to the farm?	Monkey lived along the road to the farm.	4	8	24	48
Was Monkey afraid of the boys?	No, Monkey was not afraid of the boys.	5	10	31	62
What did the farmer notice of his sons?	The farmer noticed that his sons were getting thinner.	0	0	19	38
Did the boys finally tell their father the truth?	Yes, they did.	3	6	25	50
What did the farmer tell his sons?	The farmer told his sons not to ever keep secrets from him.	1	2	13	26
What did the farmer teach his sons to do?	He taught his sons to trick Monkey.	1	2	14	28
What came out of the basket?	A big dog came out of the basket.	9	18	38	76
Did Monkey ever return since that day?	No, Monkey never returned.	14	28	34	68

Objective 2: Determine the reading rate after the READ 180 reading intervention strategy to suggest its effectiveness in improving students' reading deficiencies

Low scoring pupils before the teaching intervention strategy, later taught using the READ 180 teaching model, improved significantly (see Table 6). The scoring rate was 40% after the school shut down because of the COVID- 19 epidemic and over 90% at four weeks.

TABLE 6
TEST 2: SEPARATING AND CATEGORISING LETTERS BY UPPERCASE AND LOWERCASE

| Southern Province | Sample Size | Letter Case | | | |
		Upper Case	*%*	*Lower Case*	*%*
School 1	06	05	90	05	90
School 2	06	06	100	06	100
School 3	05	05	100	05	100
Overall		**5.3**	**96.7**	**5.3**	**96.7**

According to Table 7, pupils' test scores after READ 180 teaching-strategy increased more than 80% in four weeks.

TABLE 7
TEST 2: BLEND BROKEN PARTS OF A WORD INTO ONE WORD

School Number	Average Number of Parts Blended into Word	%	Average Number of Parts Blended into Word	%
1	8	90	7	100
2	8	90	6	100
3	6	80	5	90
4	7	100	6	100
5	7	100	5	50
Overall	7.2	92	5.8	88

Table 8 shows that the scores of the pupils in the south and their counterparts in the west who earlier mispronounced or skipped most of the words improved after the READ 180 teaching intervention. They mispronounced or skipped an overall average of 13% in the south and less than 5% in the west.

TABLE 8
TEST 2: RECORDED READING MISTAKES MADE BY PUPILS (N = 100)

School Number	Southern Province			Western Area		
	Average Number of Words Mispronounced	or Skipped	%	Average Number of Words Mispronounced	or Skipped	%
1	1.7		8.5	1.0		5.0
2	4.4		22	1.5		7.5
3	2.5		12.5	1.4		7.0
4	2.8		14.5	0.6		3.0
5	1.5		7.5	0.1		0.5
Overall	**2.9**		**13**	**0.92**		**4.6**

According to Table 9, there was 65% to 100% improvement four weeks after the READ 180 intervention, particularly for pupils in Schools 1 and 2 in the south (see Table 9).

TABLE 9
TEST 2: THE NUMBER OF WORDS READ CORRECTLY BY PUPILS (N = 100)

School Number	Southern Province		Western Area	
	Average Number of Words Read Correctly	%	Average Number of Words Read Correctly	%
1	18.3	92.5	19.0	95.0
2	15.6	78.0	18.5	92.5
3	17.5	87.5	18.4	92.2
4	17.2	86.0	19.5	97.5
5	18.5	92.5	19.8	99.0
Overall	**17.4**	**87.3**	**19.0**	**95.2**

A significant improvement was observed in pupils' performance after the 4-week READ 180 intervention (see Table 10).

TABLE 10
TEST 2: RESPONSES OF PUPILS TO QUESTIONS FROM THE PASSAGE (N = 100)

Question	Correct Answer	Southern Province		Western Area	
		Number of Correct Answers	%	Number of Correct Answers	%
How many sons did the farmer have?	The farmer had two sons	50	100	50	100
What were the names of the farmer's sons?	The names of the farmer's sons were Momoh and Sorie.	50	100	50	100
Who lived along the road to the farm?	Monkey lived along the road to the farm.	50	100	50	100
Was Monkey afraid of the boys?	No, Monkey was not afraid of the boys.	50	100	50	100
What did the farmer notice of his sons?	The farmer noticed that his sons were getting thinner.	32	64	37	74
Did the boys finally tell their father the truth?	Yes, they did.	50	100	50	100
What did the farmer tell his sons?	The farmer told his sons not to ever keep secrets from him.	25	50	27	54
What did the farmer teach his sons to do?	He taught his sons to trick Monkey.	27	54	35	70
What came out of the basket?	A big dog came out of the basket	50	100	50	100
Did Monkey ever return since that day?	No, Monkey never returned.	50	100	50	100

Table 11 reveals that the following are crucial issues that could be partly the reasons for pupils high learning poverty in the study area: 1) More than one-half of the teachers interviewed at the primary level were untrained and unqualified; 2) Reading was incorporated into the Language Arts lessons in most of the schools studied, and not treated as a separate subject; 3) a majority of the teachers were still using the traditional teacher-centric instruction methods where the teacher leads and the pupils repeat after them; 4) a majority of the teachers were dissatisfied with their monthly salaries/wages, or because they were not encouraged enough to be more committed to their work, and 5) a majority of the teachers interviewed were aware that most of their pupils could not read well.

TABLE 11
TEACHERS' OPINIONS REGARDING TEACHER-COMMITMENT AND MOTIVATION (N = 10)

Question	Response	Number of Response	%
What qualifications do you have to teach at the primary school (TC, HTC, Untrained & Unqualified, etc.?)	Untrained & Unqualified	6	60
How many days per week do you have Reading/Language Arts on the timetable?	2 days	5	50
Out of these assigned days, how many days are you able to teach Language Arts?	2 days	5	50
What is the duration for each Reading/Language Arts Lesson?	45Mins.	8	80
Do you teach reading as a separate lesson or you teach it as part of Language Arts?	No.	8	80
Do you like teaching Reading/Language Arts?	Yes.	10	100
Which method do you use to teach your pupils Language Arts?	Presenting lessons and letting pupils practice the lessons.	7	70
Do you have all the teaching materials you need to teach Language Arts?	Yes.	5	50
If yes, please name the materials you have been using.	Textbook, Reader Book, Writing Book	10	100
Are you satisfied with your job?	Yes	4	40
If no, why?	I don't have the encouragement/the money is too small.	6	60
Do you earn enough money to keep you in this job?	No.	10	100
Is the school environment conducive for teaching Reading/Language Arts?	No.	6	60
Please state the reason for your answer.	The noise caused by the neighbours	6	60
With all sincerity, can the majority of your pupils read well?	No, not all.	7	70
If no, why can't the majority read?	The books are not enough or available for the children.	7	70

B. Discussion

The results of this study regarding the rate of reading proficiency and poverty after the COVID–19 school shutdown imply that very few pupils in the lower primary schools can read simple texts efficiently. This is worse in schools in the provinces far removed from the urban areas. (See tables 2, 3, 4 & 5). This result agrees with several education researchers. The World Bank and UNESCO Institute of Statistics database estimated that 53% of children in the third world or low-income countries and 80% in poor countries could not read and understand a simple story (World Bank, 2019). The *Multiple Indicator Cluster Survey- Round 6* of Statistics Sierra Leone (2017) similarly revealed this deficiency. The findings also support Kuhfeld et al.'s findings that students who lacked consistent instructions during the coronavirus school shutdown might retain only 70% of their annual reading gains.

Regarding the reading rate after the READ 180 reading intervention strategy, pupils who mispronounced or skipped most of the words before the reading intervention improved, scoring as less as 30% to 00% of the words they skipped or mispronounced (see Table 8). This result confirms the views of other scholars, implying that instructional intervention with intensive fluency instruction can improve the reading deficiencies of learners at all levels. The study's application of Kim et al.'s (2010) READ 180 reading intervention to pupils with reading deficiencies in the study area proved effective. Similarly, the *Access Center's* (2005) comprehensive means of gathering assessment data for learners proved effective in determining the reading proficiencies of the pupils in the study area. It becomes clear that the suggested set of assessments will help improve students' reading skills and comprehension of the contents of their curriculum.

Furthermore, the result that teachers were not satisfied with their job due to the small amount of money they earned at the end of the month, by implication, seems to be one of the root causes of the breakdown of education in Sierra Leone. Still, the result regarding teacher qualification, satisfaction, and the number of periods for Language Arts showed glaring disparity. However, the results draw the attention that there is a need for a viable mechanism to be put in place regarding teacher qualification, satisfaction and commitment, as further discovered by Shumba and Gada (2018) concerning in-service teacher training; Han et al. (2016) regarding teacher commitment; and Aliakbari and Amoli (2016) relating to teacher empowerment, as the leading causes of reading deficiency at the lower grades.

IV. CONCLUSION

This study has demonstrated that over 70% of class 5 mispronounce and skip words when they read stories after the COVID- 19 pandemic school shutdown. The READ 180 teaching intervention can help improve pupils reading efficiency if used in schools in Sierra Leone.

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