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Intermediate grade school learners' sex, word recognition, and reading comprehension

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Abstract

Unquestionable are the immeasurable benefits of reading to an individual's mental growth. Consequently, scholars have long established the importance of developing reading skills at the elementary level. Although reading is a recurrent research subject, the prevalence of reading difficulties among learners remains. This necessitates the use of periodic assessments of learners' reading proficiency to serve as the basis for remediation programs. In this study, the researchers used the descriptive correlational design to measure the reading level of pupils' using the Philippine Informal Reading Inventory (Phil-IRI), focusing on word recognition and reading comprehension. Data were gathered from 800 sampled public school grade school intermediate level pupils (431 males and 369 females) enrolled in the School Year 2016-2017 in two Philippine provinces; specifically: Pangasinan and La Union. Inferential statistics were used to show how sex and geographic location could be determiners of reading performance and how word recognition can affect reading comprehension. Findings revealed that the majority of the pupils are in the frustration reading level and males are better readers compared to females. Findings further showed that pupils from La Union have better reading Proficiency than those from Pangasinan. Though word recognition can be attributed to reading comprehension, it is not a single factor affecting reading comprehension, implying that other strong factors may influence pupils' reading comprehension. The researcher strongly recommends schools in the provinces implement intensive reading remediation programs to address students' reading difficulties. Future researchers are likewise encouraged to explore other factors that could be influencing reading comprehension like socio-demographic factors and biological factors.

Keywords: Sex; Reading Comprehension; Word Recognition; Informal Reading Inventory; Reading Proficiency

1. Introduction

One of the basic skills for grade school intermediate learners is reading. This is because reading may serve as a source of pleasure and information as well as a means for widening and deepening one's knowledge of a language. Through reading, students learn, gain knowledge, and develop new skills (Olivar, 2014). It is also an essential tool for knowledge transfer (Issa et al. 2012). Through reading, a learner may know more about the world and the environment.

When a child learns to read and develops a love for books, he can explore for himself a wealth of human experiences and knowledge in the comfort of a chair. Gear (2006) highlighted that developing positive reading comprehension skills at an early age can greatly affect learners' ability to approach new complex concepts in many different areas.

Though reading is a basic communication skill, it entails a complex process because decoding text evokes voices, memories, knowledge, and experiences from other times and places – some long dormant, some more immediate (Christine Cziko et al., 2000). Palani (2012) referred to reading as an identification of symbols and the association of appropriate meanings with them. He believes reading is a process of thinking, evaluating, judging, imagining, reasoning,

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and problem-solving. Indeed, success in reading comes hand in hand with comprehension, an information process that a learner can use to get basic ideas from printed text.

Studies reveal that approximately 10 to 15% percent of children enrolled in typical elementary schools are suffering from cases ranging from mild to severe reading disabilities despite the constant efforts of school systems to upgrade instruction (Harris, 2001). The main reason for children being kept back in the elementary grades and continuing to flock the secondary schools and colleges is their inadequate reading ability.

In another study, Harris (2001) identified factors believed to be primary determinants of learners' abilities to read. These factors include background experiences, language abilities, and reading purposes. Accordingly, sex is also another factor that scholars over the years have hypothesized to influence a child's reading ability; however, their findings are either contradicting or lacking a pertinent basis.

Research has shown that at an early age, girls acquire faster vocabulary growth. Average vocabulary growth demonstrates this advantage: beginning with a mean 13-word difference favoring girls at 16 months, which grows to a 51-word difference at 20 months, and a 115-word difference at 24 months. This gap in acquiring vocabulary items was even shown to occur, to some degree, above and beyond input, that is, how much mothers talked to their children. The ability to learn and use language contains a female advantage from as early as the first two years of life.

The aforementioned findings are supported by Reznick and Goldfield (1999) who found that vocabulary growth is faster among girls under two years old. In fact, Hohm et al. (2007) stated that at the age of 10 months, there is a significant difference between sexes in language development which is in favor of girls. Carr and Pauwels (2006) also stated that girls are better at reading because of their interest in reading literacy.

Studies from Birch & Gary (1998) and Silverman (2003) have suggested that girls tend to progress more efficiently academically and attain higher levels of education than boys. Also, Matthews et al. (2009) emphasized the growing sex gap in academic achievement, which was fortified through the assessments done by the Programme for International Student Assessment (PISA), Progress in International Reading Literacy Study (PIRLS), and the Norwegian National Tests indicating (Mullis et al., 2012; Stoet and Geary, 2013; Organization for Economic Co-operation and Development, 2014).

For boys, the underlying factor, according to Giedd et al., (2012), might be the sex hormones that cause them to be more prone to reading difficulties. Based on studies by Geschwind and Galaburda in 1987 and Tonnessen and Upstad in 2015, the development of testosterone in the male fetal brain in the left hemisphere seems slow. According to Dekker et al. (2013) and Stoet and Geary (2013), the processing speed and visuospatial working memory of boys tend to develop executive functions at a slower rate than girls.

Although there have been several comparisons between males and females in terms of academic skills and cognitive processes, there is still no evidence that enables either sex to claim overall superiority in terms of academic achievement. Nonetheless, there are no reported studies in which boys performed better than girls in reading and writing, nor is this greater academic performance by female students in literacy a new phenomenon. The educational system is the most current environmental factor in the development of reading skills and is responsible for creating a productive learning environment for both sexes. Apart from assessing reading proficiency in some rural areas in the Philippines, this study aimed at verifying and testing other research claims about differences in reading abilities between boys and girls.

One dimension of reading is oral reading fluency which is defined as rapid, efficient, accurate application of word recognition skills that permits a reader to construct meanings or comprehend. Tindal et al. (2016) and Rasinski (2014) asserted that fluency as a skill, feeds into comprehension which is the goal of reading. Thus, learners must develop oral reading fluency at an early stage.

The primary reason one reads is to understand what has been read, not just utter the words. To comprehend a text, readers must be able to decode words quickly, easily, automatically, and smoothly (National Reading Panel, 2000). Readers who lack word-recognition skills and fluency often have difficulties with comprehension. Today, there is much progress in the concept of reading comprehension.

It is not only through semantic (word meaning), syntactic (word order), and phonetic/gramophonetic cues (sound-word relationship) but it takes place through the good interaction of the text, context, or situation and the prior knowledge and experience of the reader. Pinnell et al. (1995) revealed that reading fluency is positively correlated with reading comprehension. In this sense, fluency serves as a bridge between accurate decoding and understanding the text (Pikulski & Chard, 2005; Rasinski & Hoffman, 2003).

Researchers Landry and Smith (2006) argued that one of the most important goals of elementary school is to produce proficient readers. There has been an increased focus nationally on the development of literacy for all students. This increased focus has spawned several important documents to assist teachers in providing instruction to prevent reading difficulties and improve overall reading performance. Each of these documents identified reading comprehension as an essential literacy outcome for students and the ultimate goal of reading instruction. However, these national panels also acknowledged a need for more research on reading comprehension. In comparison to existing research, studies on reading comprehension including vocabulary development are less extensive, rigorous, and current. This conclusion was echoed by the RAND Reading Study Group (2008) which pointed out that "evidence-based improvements in the teaching practices of reading comprehension are solely needed".

As a result, several research initiatives, sponsored by the United States Department of Education's Institute of Education Sciences, are currently underway that could significantly add to the understanding of ways to support the reading skills of all students.

Organizations like the Programme for International Student Assessment (PISA) revealed that students from countries like the Philippines, Dominican Republic, and Indonesia are among those who occupy the lowest ranks in the areas of Reading, Science, and Math. In the Philippines, students' lack of reading skills in identifying word meanings and interpretation of texts has been a prevailing problem in public schools. The Department of Education (DepEd) reported that there has been a 21.36% increase in NAT results from 2006 to 2009. The 2009 NAT revealed a rise in mean percentage score (MPS) of only 66.33% from 54.66% in 2006, which equates to an improvement of 11.67%. However, it is stated in the report that a 66.33 MPS (from 54.66% in 2006) was still a rather low score because it can be classified as only being near mastery level.

What is more alarming is that the mastery level was only 14.4% among Grade 6 students. This means that below-mastery scores were at a staggering 85.6% among the former and 98.1% among the latter. Luz (2007) also cited that many Filipinos are still poor readers based on the report on literacy. The report indicates a decline in the literacy rate in the country from 1994-2003.

Martinez (2010) was among those who attempted to evaluate the reading activities of Filipino children as part of an educational survey on the status of education in the Philippines. The reading test, which is a part of the survey, included skills in one-paragraph reading, sentence meaning, and vocabulary. The results of the test showed that students were poor in comprehension.

The reading ability of Filipino children was generally two years behind that of American children. The survey also revealed that the main cause of poor achievement of Filipino children in reading was English as a foreign language and the textbooks used by Filipino children.

The enhancement of reading skills is one of the major considerations in the K to 12 Basic Education Program. This is the reason the Department of Education (DepEd) implemented the "Every Child A Reader Program (ECARP) through DepEd Memorandum No. 402.s.2004 and Administrative Order No. 324 whose objective is to equip public elementary pupils with planned training in reading and writing. The program was supposed to make learners independent young readers and writers. The Department of Education has also provided a series of programs and interventions to remediate students' difficulty in reading. These are the Summer Camp Reading Program, Read-a-Thon, and DEAR (Drop Everything and Read) time which required school officials to conduct various reading activities for remedial classes. The Mother Tongue Based-Multilingual Education was also implemented in School Year (SY) 2012-2013 in all public schools specifically in the Kindergarten, Grades I, II, and III as part of the K to 12 Basic Education Program in support of the goal "Every Child-A-Reader and A-Writer by Grade I" (DepEd Order No. 16, s. 2012). In the said curriculum, the first language (L1) is taught as a subject and as a medium of instruction in teaching Math and Science from Grades I-III.

Despite various programs and remedial activities being conducted in public schools, poor reading performance remains highly observable. In Region I particularly, the language assessment for Grade III pupils in 2014-2015 showed that the level of students' vocabulary in Ilocano was 71.49 and 66.47 in English. The National Achievement Test in the region also showed that the Grade 3 pupils scored 53.26 in the English Reading Test and 59.47 in 2012-2013.

The reported scores showed that learners were not able to reach the 75% passing rate in English as well as in Ilocano. School authorities have always looked for reasons as to why numerous students have poor reading levels, according to National Assessment Tests (NAT) results.

An instrument was developed by the DepED. This is called Philippine Informal Reading Inventory (Phil-IRI). It was intended to assess learners' reading proficiency levels including word recognition, comprehension, and the reading speed of elementary school pupils. It is an assessment tool that is composed of graded passages packaged in 2 sets: 1) Phil-IRI Oral Test (English and Filipino) and 2) Speed and Comprehension also in English and Filipino. Each set of Phil-IRI assessment tools comes with a manual of administration, forms for recording student scores, and test materials. The oral assessment tool measures the pupil's comprehension level vis-à-vis within context of oral assessment. The speed and comprehension assessment tools aim to measure the pupils' reading abilities whether the context of evaluation is silent or oral according to the Phil-IRI Tool.

IRI uses reading miscues to assess oral reading skills and word recognition (the ability to identify words on sight with automaticity) is weighed through inventory. The participants silently read a given grade level passage to test their reading comprehension skills (the ability to create meaning) which is measured according to the number of correct answers to the questions asked regarding the grade level passage. The questions are arranged according to order of difficulty: literal questions whose answers are explicitly stated/given in the passage, interpretative questions which require the participants to read between the lines to find the answer, and applied questions that test the learner's way of visualizing things based on his scheme.

The foregoing status of reading performance at the elementary level, the gaps in knowledge earlier mentioned, as well as the contradicting views on sex-related reading performance differences among readers, motivated the researchers to identify the reading levels of students based on word recognition and reading comprehension based on Phil-IRI description.

Also, this study attempted to determine to find a significant difference in pupils' reading levels when grouped according to their sex and province and a significant relationship between students' word recognition and reading comprehension. In investigating key variables, the researcher considered Frederic Bartlett's Schema Theory which describes how the background knowledge of the learner interacts with the reading task and illustrates how a student's knowledge and previous experience with the world are crucial to deciphering a text (Pardede, 2016). To simplify, the schemata helped readers process and understand the text. The ability to use these schemata, or background knowledge, plays a fundamental role in one's trial to comprehend a text. Schema theory relates to past experiences that lead to the formation of mental frameworks that help a reader make sense of new experiences.

The researchers see the findings of this study as a reference for providing empirical feedback that could help enhance students' reading comprehension. This can be done by integrating strategies in teaching reading in the early stage of a learner's reading activities. Further studies should be made to explore factors that may affect learners' reading comprehension. This is to improve learners' literacy rate and consequently, improve their international standing in various assessments like the Programme for International Student Assessment (PISA) and Trends in International Mathematics and Science Study (TIMSS).

2. Methods

2.1. Research Design

The study utilized the descriptive correlational design. This made it possible for the researchers to determine how much variation was caused by one variable about the variation caused by another variable. The quantitative method was used for the of purpose describing the key variables, and then finding the differences and relationships between them (Zulueta and Costales Jr., 2003).

2.2. Population of the Study

The respondents of the study consisted of 800 Grade 4 pupils, equally distributed from the two provinces of the Philippines: La Union and Pangasinan. The Shapiro-Wilk Test was used to determine the normality of distribution for the respondents' profile specifically sex and province. To reduce a large population, the random sampling technique was utilized to come up with 431 male and 369 female pupil respondents enrolled during the Academic Year 2016-2017. Considering the previous results of language assessments, the researcher opted to conduct the study in public schools of Region I which is composed of six divisions. The researchers then identified representative divisions and

selected sample schools from the divisions. The researchers focused on Grade 4 only based on the notion of Roldan (2001) who conducted curricular assessments and emphasized that children's reading abilities rise in the early ages then tend to plateau at the intermediate level or approximately in the 4th grade capacity.

Another consideration is the Philippine educational system's curriculum shift to Kinder to Grade 12 (K-12) curriculum, during the School Year 2012-2013; hence the curriculum of the target respondents differs from that of the intermediate levels (Grades 5 and 6).

3. Instrument

The researcher utilized the Philippine Informal Reading Inventory which assesses the strengths and weaknesses of students by reading aloud a short grade-level passage. The response of each participant was observed and listed to rate word recognition covering pronunciation, miscues, and oral reading speed. The word recognition level is identified by comparing the respondents' computed percentage in Word Recognition with the corresponding range. The Comprehension Level is identified by comparing the respondent's computed percentage of Comprehension with the corresponding range. In measuring the reading comprehension, the researcher asked the participants to read silently the selected passage, that contained comprehension questions. The respondents answered three levels of comprehension questions: Test I (1-3) literal comprehension, Test II (4-5) interpretative comprehension, and Test III (6-7) applied level of comprehension (Villanueva & Delos Santos, 2008).

3.1. Data Gathering Procedure

After the consent from the Regional Director was secured through the School Division Superintendent, the researcher sought the help of School Principals and English Coordinators. The researcher oriented the the teachers concerned and communicated with the parents or guardians of the respondents to inform them about the objectives and ethical considerations of the study particularly in terms of confidentiality and human subject protection to obtain parental assent.

With the assistance of English teachers, the researcher personally administered the oral reading inventory to five students at a time. This was done so as not to sacrifice the learning for the entire period of the reading teacher, since the inventory was done individually. This process was carried out until all the respondents were through with the inventory.

3.2. Data Analysis

Frequency and percentage distribution were used in the computation of word recognition and reading comprehension scores. In computing the respondents' score in word recognition, the number of miscues (mispronounced words) was divided by the total number of basic sight words, then the quotient was multiplied by 100.

$$WR = \frac{\text{No. of miscues}}{\text{No. of words}} \times 100$$

Reading comprehension was computed by dividing the number of correct answers by the the total number of questions, then multiplying by 100.

$$CR = \frac{\text{No. of correct answers No}}{\text{No. of questions}} \times 100$$

The Phil-IRI's standards in interpreting the word recognition scores are as follows:

Table 1 Philippine Informal Reading Inventory Oral Test Criteria

	Word Recognition	Comprehension
Independent	97-100	80-100
Instructional	90-96	59-79
Frustration	89-below	58-below

The overall reading level was determined based on the combined word recognition and comprehension scores as shown in the table below.

Table 2 Interpretation of Oral/Silent Reading Test Results

Word Recognition	Comprehension	Reading Level
Independent	Independent	Independent
Independent	Instructional	Instructional
Independent	Frustration	Frustration
Instructional	Independent	Independent
Instructional	Instructional	Instructional
Instructional	Frustration	Frustration
Frustration	Independent	Frustration
Frustration	Instructional	Frustration
Frustration	Frustration	Frustration

Chi-square was used to determine the relationship between the students' word recognition and reading comprehension. Mann-Whitney U was used to find the significant difference in the students' reading levels under two categories: gender and province. This non-parametric test was used because the test of normality showed that the data were not evenly distributed.

4. Results and Discussion

In terms of word recognition, majority or 58.8% of the respondents were in the instructional reading level (recognized 90-96% of the words correctly), 28% of them were in the frustration level (recognized 89% and below of the words correctly), and only 12% were in the independent level (recognized 97-100% of the words correctly). The results for reading comprehension require more attention as data show that 84% of the respondents were in the frustration level (understood only 58% and below of the words), 9.9% in the instructional level (understood only 59-79% of the words), and only 5.6% in the independent level (understood 80-100% of the words). This means that although majority of the respondents recognized or pronounced the words correctly, many of them did not understand the meaning of those words. With the combined scores of the respondents, it can be interpreted that almost all (89.1%) of the Grade 4 pupils are in the frustration reading level; meaning, they tend to withdraw themselves from reading by refusing to read. Only 36 or 5.5% of 800 pupils are independent readers or those who can read alone with ease without the guidance of the teacher while 51 or 6.4% of them are instructional or can only read when guided.

Table 3 Pupils' Reading Level as to Word Recognition and Reading Comprehension

Levels of Word Reading		Recognition %	Reading Comprehension		Reading Level	
	<i>f</i>		<i>F</i>	%	<i>f</i>	%
Independent	100	12.4	45	5.6	36	4.5
Instructional	470	58.8	79	9.9	51	6.4
Frustration	230	28.8	676	84.5	713	89.1
Total	800	100.0	800	100.0	800	100

The results confirmed the evaluation of students' reading activities conducted by Martinez (2020) showing that Filipino students are poor in reading comprehension making them generally two years behind that of American children. The empirical data suggest that La Union and Pangasinan-based respondents of this study are experiencing challenges making sense of what they are reading; thus, fortifying the conclusion of Luz (2007) that many Filipinos are still poor

readers. This also confirmed National Assessment Tests (NAT) results for SY 2013-2014 indicating that numerous students are in the poor reading level.

Table 4 Significant Difference in Reading Levels when Grouped according to Gender and School Division

		N	Mean Rank	Sum of Ranks	Mann-Whitney U	Z	p-value
Reading	Male	431	409.94	176685.00			
	Female	369	389.47	143715.00	75450.000	-2.313	0.021
Level	Total	800					
	La Union	400	417.02	166807.50			
	Pangasinan	400	383.98	153592.50	73392.500	-3.744	0.001
	Total	800					

As shown above, the reading level of the male pupils was significantly higher than that of female pupils. It is also worth noting that the reading level of the pupils from La Union was significantly higher than those from Pangasinan as evidenced by $U = 73392.500$, and a p-value of 0.001. The data further showed that reading comprehension results of the tests indicate that the scores are not evenly distributed.

These results are aligned to the findings of Millard (1997) who said that difference in gender of learners often identified difference in intellectual activities including reading. The characteristics associated with being male or female provide a better predictor of the learners' reading skills and motivation to read. However, the data on the difference in reading level in terms of gender does not agree with Millard that reading has been recognized as an activity more closely associated with females than males. The data is also in contrast to the findings of Meece et al. (2006) who found that boys considered mathematics, Science and Sports as interesting topics while girls accordingly place higher value on reading.

Table 5 Reading Level Cross Tabulation when Grouped according to Gender

Reading Level							
Gender	Frustration		Instructional		Independent		Total
	f	*%	F	*%	f	*%	
Male	374	86.8	33	7.6	24	5.6	431
Female	339	91.9	18	4.9	12	3.2	369
Total	713	89.1	51	6.4	36	4.5	800

When cross tabulated, it reveals that a higher percentage of female respondents (91.9%) are in the frustration reading level compared to 86.8% among male respondents. There are also more independent readers (5.6%) among male respondents than female respondents (3.2%). This data suggests that the Pangasinan and La Union – based female respondents' performance is in contradiction to the common views that girls outperform boys in reading. This supports the result of the statistical test in the previous table indicating that male students have better reading level than female students as shown by the obtained values.

The results did not agree with Carr and Pauwels (2006) who stated that girls have better reading skills because of their interest in reading. The findings also contradicted a number of studies suggesting that females outperform males in reading including the early study of Huttenlocher et al. (1991) who believed that at an early age, girls acquire faster vocabulary growth. Similarly, the compared reading levels do not support the notions of Reznick and Goldfield (1999) and Hohm et al. (2007) that language development is faster among girls. The case of the respondents also differs from the situation in Norway as reflected in the OECD reading assessment results which showed that Norwegian girls outperform boys.

Furthermore, the findings debunked the hypothesis of Geschwind and Galaburda in 1987, Giedd et al. in 2012, and Tonnessen and Uppstad in 2015 that sex hormones could cause males to be more prone to reading difficulties. Interestingly, the results did not support conclusions of Dekker et al. (2013) and Stoet and Geary (2013) that the processing speed and visuospatial working memory of the boys tend to develop executive functions at and slower rate than girls.

Table 6 Reading Level Cross Tabulation when Grouped according to Province

Gender	Reading Level						Total
	Frustration		Instructional		Independent		
	F	*%	F	*%	f	*%	
La Union	340	85.0	35	8.8	25	6.2	400
Pangasinan	373	93.2	16	4.0	11	2.8	400
Total	713	89.1	51	6.4	36	4.5	800

It is notable that more pupils from Pangasinan (93.2%) are in the frustration reading level and more pupils (6.2%) from La Union are in the independent reading level than those from Pangasinan (2.8%). This supports the result of the statistical test shown in Table 2 indicating that the students from La Union have better reading level than those from Pangasinan as shown by the obtained values. This can be attributed to the geographical location of the two provinces, La Union being a tourist destination gives students greater exposure to English as a second language.

Table 7 Relationship Between Word Recognition and Reading Comprehension

	Value	df	p-value
Pearson Chi-Square	25.010 ^a	4	0.001

Significant @ 0.05

Since the chi-square p-value of .001 is lower than the value of alpha which is set at .05 level of significance, there is enough evidence to reject the null hypothesis stating that there is no significant relationship between the students' word recognition and reading comprehension.

Table 8 Relationship Between Word Recognition and Reading Comprehension (Symmetric Measures)

	Value	Approx. Sig.
Phi	0.177	0
	0.125	0
N of Valid Cases	799	

Significant @ 0.05

The symmetric measures show that the strength of association is weak as evidenced by the Cramer's value of 0.125. This implies that Pangasinan and La Union-based respondents' word recognition is not a single factor affecting their reading comprehension, implying that there are other strong factors influencing their comprehension of the text read. These factors might include cognitive, metacognitive, and motivational factors as predictors of individual differences in reading comprehension.

Though the correlation is weak, it still agrees with the statement of Palani (2012) that success of reading comes hand in hand with comprehension, an information process that a learner can use to get basic ideas from the printed text. It still is aligned with the findings of the National Reading Panel (2000) that readers who lack word-recognition skills and fluency often have difficulties with comprehension and the earlier notion of Pinnell et al. (1995) that reading fluency is positively correlated with reading comprehension. Thus, fluency remains to be a bridge between accurate decoding and understanding the text as explained by Pikulski & Chard, (2005) and Rasinski & Hoffman (2003).

The present study supports the principle of the Schema Theory which states that comprehending a text is an interactive process between the reader's background knowledge and the text. In other words, efficient understanding of the material read will require the reader to connect the textual material to his knowledge. Accordingly, the prior knowledge of the readers in terms of their vocabulary bank will affect his reading comprehension of the text. The findings showed that word recognition which is part of the learners' background knowledge or schema has relationship with reading comprehension. Though weak, the results of this study confirm that prior knowledge in a material read will affect comprehension together with other factors like metacognition and motivation (Ehrlich 1993).

5. Conclusion

Based on the salient findings of the study, the majority of the Grade 4 pupils are in the frustration reading level and males are better readers compared to females. Also, pupils from La Union have better reading ability than those from Pangasinan. Though word recognition can be attributed to reading comprehension, it is not a single factor affecting reading comprehension, implying that there are other strong factors influencing pupils' comprehension of the text read. Thus, the researcher strongly recommends that schools in the provinces covered implement intensive reading remediation programs to address students' weaknesses in word recognition and reading comprehension. Future researchers are encouraged to explore other factors that could be influencing reading comprehension. Along with socio-demographic factors, investigation on how gender causes differences in reading abilities should also be investigated.

Compliance with ethical standards

Disclosure of conflict of interest

There is no conflict of interest to be disclosed

Statement of informed consent

Informed consent was obtained from all individual participant included in the study.

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