



PISA Assessment on Reading Literacy Competency : Evidence from Students in Urban, Mountainous and Island Areas

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Abstract: This research aims to analyze the reading literacy competence of students in class VIII junior high school in Pangkajene and Islands Regency to find, understand, and evaluate information from reading texts. The research used the descriptive quantitative method. The population in this study were all class VIII students spread throughout Pangkajene and Islands Regency were divided into urban, mountainous and island areas totaling 114 schools where the sample selection used purposive sampling and cluster sampling techniques. The technique for collecting data is the test technique. The research instrument was PISA's questions in 2021. The test PISA's results showed that 26.7- 60% of students in Class VIII from the three schools in Pangkajene and Islands Regencies had very low competence in finding information, with a score of <54. Then in understanding the reading text, they could only obtain an average score of 33.03. As for the ability to evaluate text, 96.6% of students were in the low category, and only 3.4% were in the high category. This research indicated that students at the junior high school level needed the PISA assessment system to improve the quality of educational competence in Indonesia towards international education standards in the 21st century, especially in reading literacy. The PISA assessment focuses on improving the quality of teaching by teachers and learning in individual students. So that regular PISA assessments can help all students to achieve high competence if the government, school principals and teachers work together to implement and evaluate the PISA assessment on the reading literacy method.

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Introduction

Scientific literacy is essential for students to gain knowledge in various fields (Rachmatullah et al., 2016). Literacy includes skills in reading, writing, processing information, ideas, and opinions, making decisions and solving problems. Therefore, reading and writing are essential skills in education (Tavdgiridze, 2016). However, Indonesian people's literacy is still relatively low and needs improvement (Tiarina et al., 2022). It is proven by a survey conducted by the Program for International Student Assessment that Indonesia ranks last out of 40 countries in reading performance with a total score of 371 and the last rank of 41 countries in mathematics. This program aims for all world residents must be free from illiteracy (Emilia et al., 2022).

In this regard, the government issued Law no. 3/2017 concerning the Bookkeeping System with the hope of increasing the production of written works in book form. The main objective is to increase public literacy awareness (Putera et al., 2022). Ironically, the 2018 PISA results show that students' understanding of implied reading information still needs to

be improved. On average, only 9% of students aged 15 in OECD countries can distinguish factual information in a text and opinion in a text (Program for International Student Assessment (PISA), 2021). This condition causes the PISA measurement of Indonesian people's literacy power to get a low score compared to other countries.

The Program for International Student Assessment (PISA) is one of the internationally standardized testing systems organized by the Organization for Economic Cooperation and Development (OECD) to assess systems worldwide. Every three years, 15-year-old children are randomly selected to take three basic competency tests: reading, math and science (Markus, 2019). The PISA-based Test for Schools provides high-quality data for teachers and school administrations to understand the teachers' performance and the student's competence in schools compared to other schools worldwide. These tests support research, international benchmarking, and school improvement efforts. The assessment tool provides descriptive and analytical information about 15-year-old students' skills and creative application of knowledge related to reading, math, and science competencies, comparable to the existing PISA scales. PISA assessment also provides information about the relationship factors outside of school to students' abilities at school (Pearson, 2016). The PISA aims to provide evidence about students' abilities including in the field of literacy, as an evaluation and motivation to continue learning throughout their lives because parents, students and the community, as well as administrators of the education system, need to know the answers to these questions (Hopfenbeck et al., 2018).

PISA Governing Board Indonesia (Penilaian Pendidikan Badan Penelitian et al., n.d.) in 2019 states that Indonesia has followed PISA since 2000. In the 18 years starting from 2000-2018, Indonesia showed some modest improvements in reading and science and more significant gains in mathematics. Despite experiencing an upward trend throughout this period, Indonesia's 2018 PISA score has relatively decreased in all areas. The biggest decline occurred in reading (Emilia et al., 2022). Indonesia participates in PISA to find out student achievement in Indonesia compared to international standards and other countries facing similar challenges (Nugrahanto & Zuchdi, 2019). This understanding will be used to identify aspects related to student success and improve them effectively. The PISA assessment includes text, cognitive and scenarios in reading a collection of thematically linked texts to solve higher-level questions (Harju-Luukkainen et al., 2016). The distribution of questions for the 2018 PISA reading literacy assessment is shown below in Table 1.

Table 1. The Distribution of Questions based on Process and Text Sources

FRAMEWORK 2018		
	Single Text	Some Text
Finding Information 25%	Scanning and finding 15%	Searching and selecting relevant text 10%
Understanding 45%	Literal understanding 15%	Multitext inferential understanding 15%
Reflecting and Evaluating 30%	Inferential understanding 15%	Strengthen/deal with conflict 10%

Source: (OECD, 2019)

Based on the above description, as concrete to support the Indonesian literacy movement, especially in education, this research targeted students at the middle school level (junior high school) by focusing on reading performance or students' reading literacy. This research focuses on junior high school students in the Pangkajene and Island regency class VIII. Pangkajene and Island regency is a district that has a location close to the provincial capital, namely the Capital City of South Sulawesi Province, Makassar. One of the reasons students' performance is different in the PISA assessments is related to the social background

of the students (Harju-Luukkainen et al., 2016). Students at the VIII grade level were an accurate representation of adolescents. On the other hand, Class VII students were classified as teenagers; they were pretty at risk because they were still in the environmental adaptation stage at the junior high school level. As for class IX students they were students at the end of junior high school. They were more likely to be ready to enter high school at that grade level, so their mindset certainly experienced a significant increase.

Therefore, the researchers felt that measuring the literacy competence of junior high school students is essential. This measurement needs to find out the student's abilities. The goal is for all the parts, such as teachers, school principals, and the government, can provide appropriate treatment for the implementation of an effective and efficient literacy movement. The standard reading test used today is the PISA test. It is very well known in education and is credible in its measurement. PISA assessment can analyze the reading literacy competence of students in class VIII junior high school in Pangkajene and Islands Regency to find information, understand information, evaluating information from reading texts.

Research Method

This research used a descriptive quantitative approach to measure students' reading literacy competencies through scores from the collected samples according to the facts. PISA is classified based on the demographic scope of a country launched by the Organization for Economic Cooperation and Development in 1997 (Sahyar et al., 2020). Therefore this research was conducted in Pangkajene and Islands Regency, South Sulawesi. The locations were divided into urban, mountainous and island areas. Research in urban areas was conducted in Pangkajene District, mountainous areas were conducted in Bungoro District, and island areas were conducted in Liukang Tupabbiring District. The population in this study were all class VIII students spread throughout Pangkajene and Islands Regency, totalling 114 schools (Kemdikbud, 2022).

Based on this population, the researchers used sampling technique. It is a way to determine the number of samples that will be used as data sources, taking into account the characteristics and distribution of the population so that they can be truly representative (Pratama et al., 2020). Three sampling techniques, namely purposive sampling, first cluster sampling, and second cluster sampling. First, sampling aims to be carried out by selecting schools that are only located in urban, mountainous and island areas. The following is the distribution of junior high schools in the three regions in Pangkajene and Island Regency and the details shows in the appendix below.

Table 2. Distribution of Junior High School in Three Regions

No	Region	Subdistrict	Total of Schools	Total
1.	Urban	Pangkajene	14	14
2.	Mountains	Balocci	5	33
		Mandalle	6	
		Segeri	6	
		Tondong Tallasa	5	
		Bungoro	11	
3.	Island	Liukang Tangaya	13	
		Liukang Kalmas	10	40
		Liukang Tupabbiring	9	
		Liukang Tupabbiring Utara	8	
Total of Schools				87

Source: (Kemdikbud, 2022)

Second, the first cluster sampling was applied by drawing many schools in each region. One school was taken from each region as a sample, so the total number of schools sampled in this research was three. The following describes the results of the second sampling using the cluster sampling technique.

Table 3. Samples of Junior High School in Three Regions

No.	Region	Subdistrict	The Name of Junior High School	The number of classes VIII
1.	Urban	Pangkajene	SMP N 2 Pangkajene	5
2.	Mountains	Bungoro	SMP N 2 Bungoro	5
3.	Island	Liukang Tupabbiring	SMP N 8 Satap Lk. Tupabbiring	3

Third, the second cluster sampling by drawing lots of classes in each school selected from the second sampling. Each school was selected as a sample taken by one class so that the whole class that became the final sample of this study was three classes from different schools and regions. The following describes the results of the third time sampling using the cluster sampling technique.

Table 4. Sample of Class VIII Junior High School in Three Regions

No.	Region	Subdistrict	The Name of Junior High School	Sampe
1.	Urban	Pangkajene	SMP N 2 Pangkajene	VIII-3
2.	Mountains	Bungoro	SMP N 2 Bungoro	VIII-5
3.	Island	Liukang Tupabbiring	SMP N 8 Satap Lk. Tupabbiring	VIII-2

The technique used in collecting data in this research was the test technique. This test technique is carried out in several steps, namely (1) providing information on instructions for implementing the test, how to fill it in, and the duration of the time given; (2) Giving instructions to fill in their data on the question sheet; (3) provide opportunities for students to answer the questions given. The duration of the test completion was two hours of lessons or 50 minutes. This period was used to answer 20 question numbers. Data collection was carried out on different days for each school for three days because there were three schools. The research instrument is the test. The test given to measure reading literacy competence was a PISA-based reading literacy test using PISA 2021 questions. This question consisted of 20 questions, including multiple-choice, complex multiple-choice, short answer, closed essay, and open essay. The questions are divided into frameworks. In detail, the PISA reading questions in finding information consist of 5 questions, in understanding information consisted of 9 questions, and in reflecting and interpreting information consists of 6 questions.

This research used a descriptive quantitative method through several steps to determine students' reading literacy competence by using:

1). The scoring

The score given to the results of student answers follows the score set by PISA. The score was obtained from Take The Test: Sample Questions from OECD's PISA Assessment (OECD, 2009). A score of 0 is assigned to the wrong answer, 1 is assigned to the incomplete or partial answer, and 2 is assigned to the correct answer. Overall, the finding information question receives a maximum score of 10, the understanding question receives a maximum score of 18, and the reflecting-evaluating question receives a maximum score of 12.

2). Convert scores to grades

The score that has been given to the test results is converted into the grade using the following formula (Ibrahim & Muslimah, 2021):

$$N = \frac{\sum X}{\sum s} \times 100$$

- Make the table of student answer values
- Establish categories of students' reading literacy competencies

This study uses a benchmark reference assessment or PAP type II with a percentage value as follow:

Table 5. PISA-Based Reading Literacy Competency Indicators

Percentile Score	Category
81—100%	Very high
66—80%	High
56—65%	Enough
46—55%	Low
0—45%	Very low

Source: (Oktavia & Hardinata, 2020)

- Create conclusion

Results and Discussion

PISA is intended to assess student's ability at the end of the primary education year (students aged 15 years) to master the knowledge and skills so that they can participate as citizens or responsible members of society (She et al., 2018). Thus, students are expected to have literacy ability. PISA measures the ability of students' reading competence perspective; PISA reading literacy questions are characterized by an emphasis on high-level reading skills because the questions need understanding, evaluating, and using information, knowledge, and potential (Tiarina et al., 2022). The results of data analysis at three schools in Pangkajene regency describe that focused on PISA assesses students' reading ability by processing discourse in three main abilities, namely:

Finding Text Information

A competent reader can carefully read the entire text to understand the main ideas and reflect on the text. However, in everyday life, readers more often use text for purposes that require specific information. Students' Reading competence can increase when they are challenged to read new types of text, formats and contexts and measures these new situations against previous ones (Vázquez-Cano et al., 2020). Finding information is a main element when reading information using complex digital systems such as internet searching and websites. The PISA framework (OECD, 2018) defines two processes in finding information: First, searching and retrieving information in texts. Second, searching for and selecting relevant texts. The results of a survey on the ability to find information at Junior High Schools in Pangkajene district are described in the following tables:

Table 6. The Student's Competence in Finding Text Information

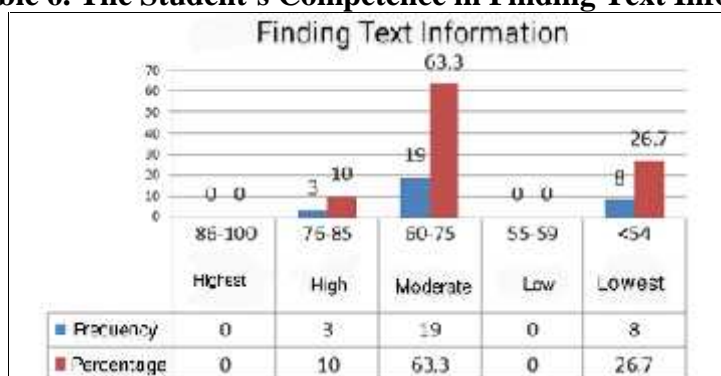


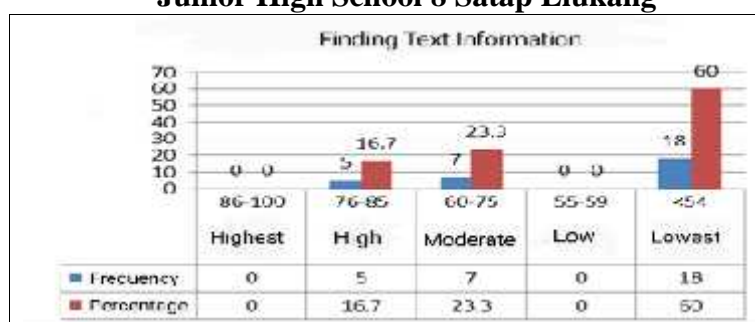
Table 6 shows that eight students (26.7%) who have a score <54 are in the very low category, 19 students (63.3%) who have a 60-75 range are in the medium category, and there are three students in the high category (10%) who have 76-85 range. Based on these data, the highest percentage is in the medium category, while the lowest is in the very high category. The data from statistical analysis results are described in the following data:

Table 6.1: Statistical Reading Literacy

Statistics		
Reading Literacy		
N	Valid	30
	Missing	0
Mean		53.33
Median		60.00
Minimum		0
Maximum		80
Sum		1600

Based on the data above, Class VIII Junior High School 2 Pangkajene have an average score (mean) of 53.33, a median of 60, and a total score of 1600. The statistical analysis results indicate that the student's competence in finding text information is in a very low category.

Table 7. The Student's Competence in Finding Text Information for Class VIII Junior High School 8 Satap Liukang



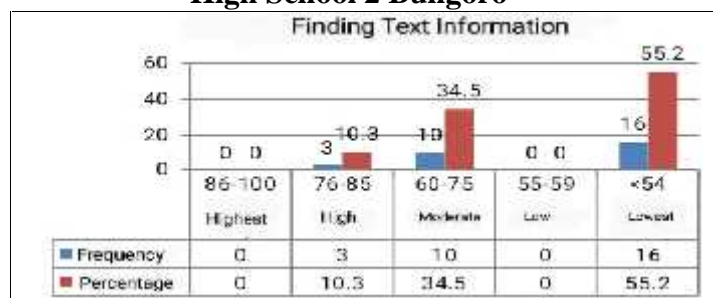
The table above explains that 18 students (60%) who have <54 scores are in the very low category, seven students (23.3%) who have 60-75 range scores (23.3%) are in the medium category, and students who have 76-85 scores are five people (16.7%) in the high category. Based on these data, the highest percentage is in the very low category, while the lowest is in the high category. The data from the statistical analysis results are described in the following table.

Table 7.1. Statistical Reading Literacy Class VIII Junior High School 8 Satap Liukang

Statistics		
Reading Literacy		
N	Valid	30
	Missing	0
Mean		42.00
Median		40.00
Minimum		0
Maximum		80
Sum		1260

It can be seen that the average score (*mean*) obtained is 4, the median is 40, and the total score is 1260. The results of the statistical analysis indicate that the competence of finding student text information is in a very low category.

Table 8. The Student's Competence in Finding Text Information for Class VIII Junior High School 2 Bungoro



It is known that 16 students (55.2%) who have <54 scores (55.2%) are in the very low category, ten students (34.5%) who have 60-75 range scores are in the medium category, and students who have 76-85 scores are three people (10.3%) in the high category. Based on these data, the highest percentage is in the very low category, while the lowest is in the high category. The data from the statistical analysis results are described in the following table:

Table 8.1. Statistical Reading Literacy Class VIII Junior High School 2 Bungoro

Statistics		
Reading Literacy		
N	Valid	29
	Missing	0
Mean		43.45
Median		40.00
Minimum		0
Maximum		80
Sum		1260

It can be seen that the average value (mean) obtained is 43.45, the median is 40, and the total score is 1260. The results of the statistical analysis indicate that the competence of finding student text information is in a very low category.

Understanding Text

PISA defines *reading literacy* as the ability to understand, use, evaluate, and reflect on texts to achieve goals, develop knowledge and potential, and participate fully in society (OECD, 2019). Understanding the meaning of reading literacy is a metacognitive skill that includes awareness and the ability to use various appropriate strategies when processing a text (Tiarina et al., 2022). A good student's reading ability will help the growth of their cognitive abilities (Puteh et al., 2016). Understanding reading texts is crucial to improving abilities in other academic fields, such as mathematics and economics. The low ability to read and understand texts will greatly complicate students' understanding of other science fields (Koyuncu & Firat, 2020). The following tables show the students' understanding of class VIII's text in Pangkajene Regency based on the PISA assessment.

Table 9. The Understanding Text Competence for Students Class VIII Junior High School 2 Pangkajene

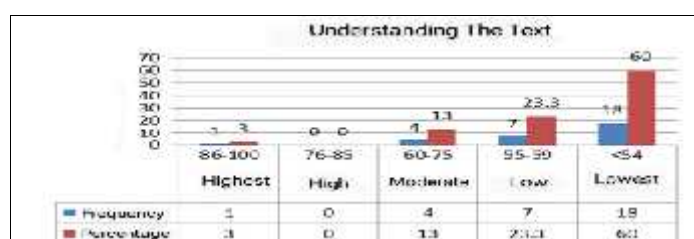


Table 9

shows that 18

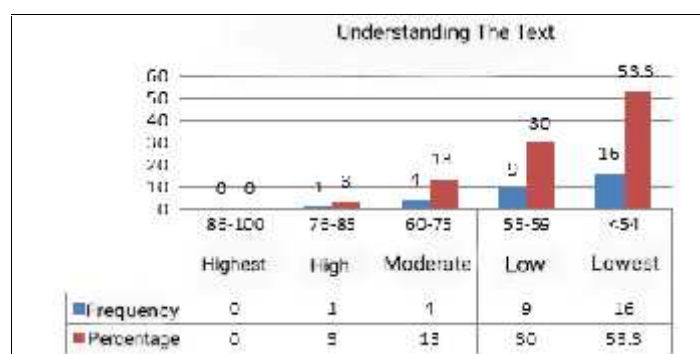
students (60%) have <54 scores, they are in the very low category; seven students (23.3%) have 55-59 score; four students (13%) have a 60-75 score who are in the medium category, and students who have scores ranging from 76-85 as many as one person (3%) are in the very high category. Based on these data, the highest percentage is in the very low category, while the lowest is in the very high category. The data from the statistical analysis results are described in the following table:

Table 9.1. The Results of Data Statistical Analysis in Understanding Text for Students Class VIII Junior High School 2 Pangkajene

Statistics		
Reading Literacy		
N	Valid	30
	Missing	0
Mean		45.87
Median		44.00
Minimum		11
Maximum		89
Sum		1376

The data in the table shows that the average score of mean is 45.87, the median is 44, and the total value is 1376. The statistical analysis results show that the competency in understanding students' texts is in a very low category.

Table 10. The Understanding Text Competence for Students Class VIII Junior High School 8 Satap Liukang



Based on Table 10 explains that 16 students (53.3%) who have <54 scores (53.3%) are in the very low category, nine students (30%) have 55-59 range values, four students (13%) are in the medium category, and students who have scores ranging from 76-85 as many as one person (3%) are in the high category. Based on these data, the highest percentage is in the very low category, while the lowest is in the high category. The data from the statistical analysis results are described in the following table:

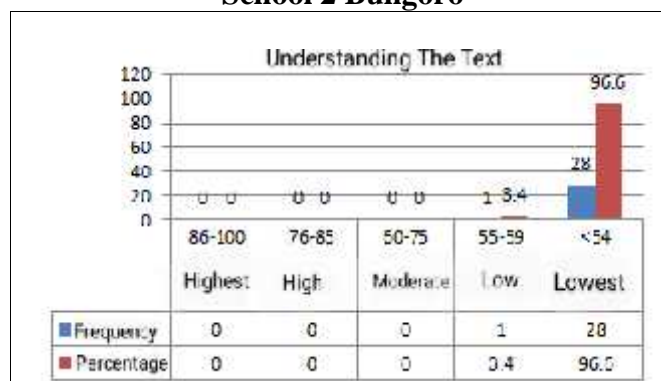
Table 10.1. The Results of Data Statistical Analysis in Understanding Text for Students Class VIII Junior High School 8 Satap Liukang

Statistics		
Reading Literacy		
N	Valid	30
	Missing	0
Mean		46.30
Median		44.00
Minimum		0
Maximum		78

Sum	1389
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It can be seen that the average score (*mean*) obtained is 46.30, the median is 44, and the total value is 1389. The statistical analysis results indicate that the competency in understanding students' texts is in the very low category.

Table 11. The Understanding Text Competence for Students Class VIII Junior High School 2 Bungoro



It is known that 28 students (96.6%) who have a value <54 are in the very low category and one student (3.4%) has a value range of 55-59. Based on these data, the highest percentage is in the very low category, while the lowest is in a low category. The data from the statistical analysis results are described in the following table:

Table 11.1. The Results of Data Statistical Analysis in Understanding Text for Students Class VIII Junior High 2 Bungoro

Statistics		
Reading Literacy		
N	Valid	29
	Missing	0
Mean		33.03
Median		33.00
Minimum		11
Maximum		56
Sum		958

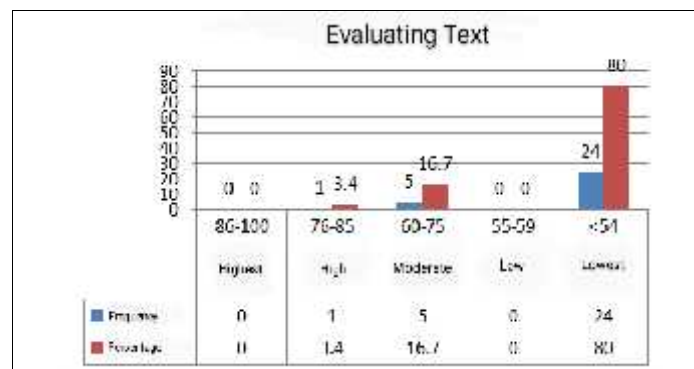
The average value (*mean*) obtained is 33.03, the median is 33.00, and the total score is 958. The statistical analysis results indicate that the competency in understanding students' texts is in the very low category.

Evaluating Text

PISA defines *reading literacy* as the ability to understand, use, evaluate, and reflect on texts to achieve goals, develop knowledge and potential, and participate fully in society. PISA reading literacy involves a high-level reading comprehension process that requires readers to provide critical, creative responses to reading in discovering the meaning, value, function, and relationship of reading content to a more significant real-life problem and the impact of that problem.

PISA sees students' competence based on the knowledge and skills which consist of three cognitive domains, namely mathematics, science, and mathematics (Program for International Student Assessment (PISA), 2021). Several tests are used to obtain this data, including multiple-choice, complex multiple-choice, short answer, closed essay, and open essay (OECD, 2018). The following tables explain the analysis results of students' abilities in evaluating texts:

Table 12. The Evaluating Text Competence for Students Class VIII Junior High School 2 Pangkajene



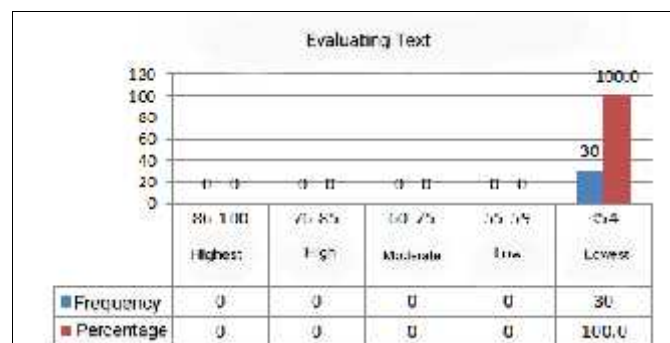
Based on the chart above, 24 students (80%) have <54 scores. They are in the very low category. Five students have a score range of 60-75 (16.7%) in the medium category, and then students with a score range of 76-85, only one person (3.4%) in the high category. The data from the statistical analysis results are described in the following table.

Table 12.1. The Results of Data Statistical Analysis in Evaluating Text for Students Class VIII Junior High School 2 Pangkajene

Statistics		
Reading Literacy		
N	Valid	30
	Missing	0
Mean		49.43
Median		50.00
Minimum		17
Maximum		83
Sum		1483

It can be seen that the average score (mean) obtained is 49.43, the median is 50, and the total score is 1483. The results of the statistical analysis indicate that the competency in evaluating students' texts is in a very low category

Table 13. The Evaluating Text Competence for Students Class VIII Junior High School 8 Satap Liukang



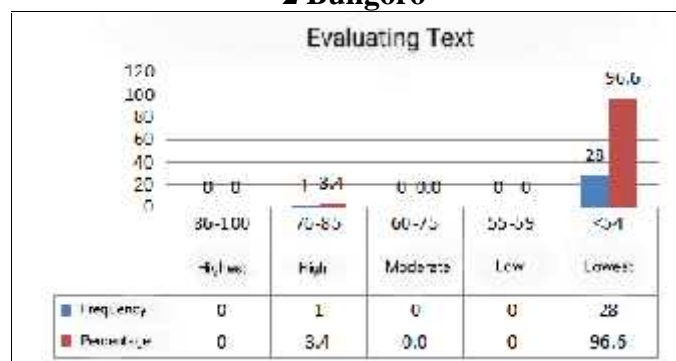
It is known that 30 (100%) students have a score of <54, which means they are in the very low category. The data from statistical analysis results are described in the following table:

Table 13.1. The Results of Data Statistical Analysis in Evaluating Text for Students Class VIII Junior High School 8 Satap Liukang

Statistics		
Reading Literacy		
N	Valid	30
	Missing	0
Mean		33.77
Median		33.00
Minimum		0
Maximum		50
Sum		1013

It can be seen that the average score (*mean*) obtained is 33.77, the median is 33, and the total value is 1013. The statistical analysis results indicate that the competency in evaluating students' texts is in the very low category.

Table 14. The Evaluating Text Competence for Students Class VIII Junior High School 2 Bungoro



It is known that 28 students (96.6%) who have <54 scores are in the very low category, and one student (3.4%) who has a range of 76-85 scores (3.4%) is in the high category. Based on these data, the highest percentage is in the very low category, while the lowest is in the highest category. The data from the statistical analysis results are described in the following table:

Table 14.1. The Results of Data Statistical Analysis in Evaluating Text for Students Class VIII Junior High School 2 Bungoro

Statistics		
Reading Literacy		
N	Valid	29
	Missing	0
Mean		50.03
Median		50.00
Minimum		17
Maximum		83
Sum		1451

It can be seen that the average score (*mean*) obtained is 50.03, the median is 50, and the total score is 1451. The statistical analysis results indicate that the competency in evaluating students' texts is very low.

Discussion

This research provides an overview and evaluation of students' reading literacy skills for students, teachers, the government of the Indonesian Ministry of Education and Culture,

and parents, particularly in Pangkajene and Islands Regency, where the reading comprehension level of students according to the PISA test is still very low. It is evidenced by the PISA test results showing that 26.7-60% of Class VIII students from the three schools in Pangkajene and Islands Regencies had very low competence in finding information, with a score of <54. Then in understanding the reading text, they could only obtain an average score of 33.03. Aside from the capacity to assess text, 96.6% of students fall into the low category, with only 3.4% falling into the high category. The PISA test results are valid and must be considered in improving students' reading skills (Rosana et al., 2020).

The results of the PISA assessment in districts, islands, and mountainous areas show that demography influences the level of students' reading ability (Cosgrove & Cartwright, 2014). It could be due to limited access to reading information, a lack of international-based reading books, and limited information about the positive benefits of PISA assessment on student achievement (Zhang & Liu, 2016). In addition, teacher, family, and government support students receive significantly contributes to their reading achievement. From a school perspective, the quality of school facilities, such as opportunities for reading activities, school administration and teacher support, and cooperation with families and the government, are essential indicators for improving students' reading skills (Koyuncu & Firat, 2020).

Conclusion

The results showed that 26.7- 60% of students in Class VIII from the three schools in Pangkajene and Islands Regencies had very low competence in finding information, with a <54. Then in understanding the reading text, they could only obtain an average score of 33.03. As for the ability to evaluate text, 96.6% of students were in the low category, and only 3.4% were in the high category. Based on the PISA assessment, seeing the results of students' reading competence in urban, mountain and island areas is very far from expectations, so the method of teaching, learning and PISA assessment is recommended to improve, measure, and evaluate students' reading competence regularly to equalize the quality of education in urban and rural areas.

Recommendation

Recommendations for future researchers are needed to examine the use of PISA for competency equality of students in villages and cities. The Ministry of Education, Culture, Research and Technology of the Republic of Indonesia is advised to include the PISA test stages in the learning curriculum; therefore, international standard text comprehension and reading information processing becomes a comprehensive graduation standard for all students in Indonesia. Additionally, PISA is the answer to filling the gap between the reading competence of students in rural areas and students in urban areas because PISA focuses on students' ability level so that it is more flexible and competency oriented. It is recommended for school principals and junior high school teachers to motivate students according to their respective competencies, reviewing the PISA learning method that focuses on competence, learning segmentation and regular assessments to find out students' progress in reading literacy. This method can improve the reading literacy skills of students with different abilities. Before teaching students, teachers must carry out trial questions with formats such as PISA test questions. Then it is also recommended that school principals invite teachers to improve competence in developing learning, which leads to PISA through Micro-Learning workshops. Teachers need to realize that the PISA method organizes learning that trains students to think at a higher level and creates a literacy culture.

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