PISA READING LITERACY: ENCOUNTERING FEMALE AND MALE' READING LITERACY ABILITY

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Abstract: Much research sounds that male students' reading competency is lower than females'. This article, then, uncovers the cognitive processes of male and female students seen from the sample questions in the 2018 PISA. This descriptive research involved fifteen male and sixteen female students. They were tested to answer PISA sample test consisting 21 items. It was found that the students score in reading literacy is poor. The highest score was 76; the lowest score was 10; the average score was 31. The result proved that female students are better in reading literacy than males are. Among eight cognitive process, female students are good at accessing and retrieving information, integrating and generating inferences across multiple sources, assessing quality and credibility, reflecting on content and form, and detecting and handling conflict. While, male students are better in integrating and generating inferences. The implication of the research is the teachers should provide HOTS instructional methods.
Keywords: *reading literacy; PISA sample test; PISA framework.*

INTRODUCTION

Not for the sake of ranking, the Program for International Student Assessment (PISA) is a diagnostic evaluation tool used to provide useful information for improving the education system. From the results of PISA 2018, Indonesia, which has participated in PISA since 2000, has reflected on the education system in Indonesia. Reporting from the Ministry of Education and Culture's Research and Development website (2021), there are several positive and negative findings from the PISA results. First, Indonesia is one of the countries with the fastest progress in expanding access to education. When Indonesia first participated in PISA in 2000, only 39% of the population aged 15 years were in school. This percentage increased to 85% in 2018. Second, the reading competence of students in Indonesia still needs to be improved. 7

out of 10 students aged 15 years reading literacy level is still below the minimum competency. They are only able to identify routine information from short readings and simple procedures. Third, there is a disparity in the quality of education in Indonesia. When the 2018 PISA oversample was carried out in DKI and Yogyakarta provinces, the average score of the two provinces was 35 points higher than the national results and in line with other ASEAN countries. This identifies the occurrence of quality gaps. Fourth, students who claimed to be frequently involved by the teacher in reading lessons scored 30 points higher than students who were never or rarely involved. Strategies that can be used to involve students include: inviting students to think, making a list of characters, retelling the contents of the reading, linking the content of reading with events around, comparing the content of reading with other readings on the same topic, determining the content of reading that is liked or not liked, as well as giving pedagogical questions to encourage students to understand the reading.

Globally, PISA results show that the strategy of reading aloud a passage to other students is not effective in improving reading comprehension for 15-year-old students. Concentrating on the content of the reading, marking or summarizing in their own words proved to be more effective in understanding the content of the reading. When the teacher gives the task of summarizing (not copying), it is necessary to ensure that students really summarize in their own words, not just copy the contents of the reading. Summarizing activities that are effective in growing reading skills are those that are able to capture important things and rewrite them with their own creativity (Ministry of Education and Culture Research and Development, 2021).

Factors that allow lower reading literacy can be caused by low social and economic status, lack of time for students to get education in childhood and low metacognitive abilities of students (Kogar, 2021; Koyuncu & Firat, 2020). Other factors that allow low literacy in a country are such as differences in the education system, lack of attention from parents, different cultures, and demographic differences of a country (Jerrim & Wyness, 2016). Ömür (2020) reassured that pupils can efficiently encounter problems at school if they are close and on good terms with their parents.

Ertem (2021) also explained that reading literacy can be low due to lack of learning materials and understanding of different subjects also concerns the capability of the PISA test (Pulkkinen & Rautopuro, 2022).

One current factor that needs to be taken into account is gender differences: it affects reading literacy (Kogar, 2021). Based on the results of research conducted by Erasmus University, boys are smarter than girls. However, Erasmus University research is refuted with current studies. PIRLS in 2016 found that girls' reading literacy skills got better grades than boys. Bijou & Mariem (2018) also revealed that boys are no better than girls when it comes to reading. Investigated by Yalcin & Bayraktar (2021), girls are better on PISA rather than boys. Syamsuri & Bancong (2022) stated that due to good motivation and focus, female students have better reading skills than male students. Meanwhile, Khorramdel, Pokropek, Joo, Kirsch, & Halderman (2022) detected that there is no difference between male and female students in reading PISA literacy. However, the reading ability of male students can be improved by enjoying the reading itself (Di Castro & Ferri (2022) and understanding of different subjects also concerns the capability of the PISA test (Pulkkinen & Rautopuro, 2022).

Seen from three contradicting previous findings, it is necessary to conduct the research whether there are differences between male and female students. Rarely do science experiments directly and rarely do the same queries are factors that cause students' inferior reading capability (Ramli, Susanti, Yohana, & Rozak, 2021)

To improve PISA results, in 2021 the Indonesian government has launched the implementation of a minimum ability assessment (AKM), which is an assessment that includes reading literacy, an assessment that uses language reasoning skills, and numeracy, an assessment that uses mathematical reasoning abilities. AKM prepares students to have future 21st century skills. The ability to be literate is not just reading what is written in the text, but rather knowing and understanding the concept of a reading. Likewise, with numeracy or numeracy skills, which are not only required to be able to count, but also to be able to apply the concept of counting to other contexts and different situations. The current government-driven AKM refers to the Program for International Student Assessment

(PISA).

Observing the two factors that influence students' reading literacy outcomes, namely gender, and school level, the researcher is interested in further exploring the gender factor of students from moderately accredited schools (B) and students' ability to answer PISA-based AKM questions. The researcher focuses more on these two factors because based on the researcher's observations during 8 meetings at a SMP 6 Bukittinggi, that there are male and female students who are equally serious, and there are also male and female students who do not pay attention to the teacher and respond to the teacher. The researcher was provoked to explore whether all cognitive processes in reading literacy were dominated by female students and the extent to which the cognitive processes of male and female students were.

Therefore, the purpose of this study was to analyze the cognitive processes of male and female students seen from the sample questions in the 2018 PISA.

The minimum ability assessment (AKM) in 2021 is an assessment that includes reading literacy, namely an assessment that uses language reasoning and numeracy skills, namely an assessment that uses mathematical reasoning abilities. The Minimum Ability Assessment (AKM) is prepared by the government with the aim of preparing students to have future 21st century skills. The ability in literacy is not just reading but how we can know and understand the concept of a reading. Likewise, with numeracy or numeracy skills, we are not only asked to be able to count, but also to be able to apply the concept of counting to another context with different situations.

Minimum ability assessment (AKM) refers to the Program for International Student Assessment (PISA). PISA is an activity that is carried out once every 3 years with the aim of improving the education system. Students taking the test are 15 years old and randomly selected from school and take tests that cover reading, math and science. PISA has gone through 7 cycles, namely in 2000, 2003, 2006, 2009, 2012, 2015, and 2018. Every year the number of participating countries that join continues to grow until 2018 there are 78 countries that have joined including Indonesia which has joined since 2000. However, after 7 cycles that have been passed, the highest PISA score of Indonesian students is only 391, namely in 2006 with a minimum international average score of 489 in 2018.

According to the OECD 2009 in Harju-Luukkainen, Vettenranta, Ouakrim-Soivio, & Bernelius (2016), reading literacy is understanding, using, reflecting and involving written texts, to achieve student goals, develop students' knowledge and potential, and participate in society. Reading literacy is defined as the ability of students to understand, use, evaluate, reflect on and engage with texts to achieve their goals. Reading literacy is the ability to understand and use the forms of written language needed by society. Students can construct meaning from text in various forms.

In addition, the OECD (2006) stated that reading literacy is the understanding, use, and reflection of written texts for the purpose of acquiring knowledge, developing potential, and participating in public. Reading literacy covers a wider range of cognitive abilities than basic coding through knowledge of word for word, grammar, linguistics, and text structure. Reading literacy is a metacognitive ability that contains awareness and the ability to use various appropriate strategies when processing text.

Furthermore, Alderson (2003) stated that reading literacy includes processes and products. Reading as a mechanistic process is classified as low-level reading. Reading is not just reading information literally, but reading interactively to gain critical-creative understanding. Then, according to OECD (2017), reading literacy is defined as the ability of individuals to understand, use, reflect on and engage with written texts to achieve their goals, develop their knowledge and potential, and participate in society.

Reading literacy can shape student behavior that can be used for various purposes. Students can read various text situations. Reading literacy can predict students' academic achievement. According to Malawi, Tryanasari, & Kartikasari (2017), reading literacy for character building through a reading literacy culture can create a literacy culture in the school environment as an effort to realize lifelong education. Then, according to the OECD (2009), reading literacy is to achieve student goals, develop students' knowledge and potential, and participate in society.

In addition, Harsiati & Priyatni (2018) stated that the purpose of reading literacy is first, to improve life skills in accessing and utilizing

information in the form of discourse to live life in the context of education, work, safety and personal safety. Second, improving live access skills and utilizing information in the form of plans, maps, tables, forms and graphs to live life in the context of education, work, safety and personal safety.

So, it can be concluded that reading literacy can improve students' understanding in drawing conclusions from the information received for the better, help students think critically, help increase students' knowledge by reading, help grow and develop good character values. Then, reading literacy aims to measure students in terms of understanding, using, and reflecting reading results in written form.

Reading literacy refers to understanding, evaluating, using, and engaging in reading to achieve students' goals, knowledge, and potential. In this context, it can be said that reading is a difficult and complex process that requires a lot of cognitive skills.

According to Koyuncu and Fırat (2020), achievement in reading comprehension is influenced by various factors such as reading fluency, text structure information, knowledge of cognitive and metacognitive strategies, vocabulary, motivation and prior knowledge. Achievement factors such as difficult and multidimensional processes also involve socioeconomic and family conditions, type of school, reading habits, learning strategies, and participation in preschool education. PIRLS in 2016 ensures that students have good reading literacy skills such as the number of reading sources at home, parents who have a hobby of reading, adequate digital tools, parents who are aware and teach reading to their children early, enter good, safe, comfortable schools, and make reading important, attend school in a fresh state, have good motivation and have technological skills. Reading literacy is also influenced by the ability of students who master more than one language with students who only master one language (Isci, 2021). Isci further stated that a person's ability in reading literacy is also influenced by their proficiency in their mother tongue. Not only that, students' reading literacy skills are influenced by support from parents, technological abilities, discipline, and hobbies. Reading is an activity that prioritizes individual activities rather than group activities (Ertem, 2021).

The PISA Reading Literacy Assessment deals with cognitive processes i.e. mental strategies, approaches or goals that readers use to negotiate their way into, around and between texts. According to the OECD (2016), there are five processes in reading literacy and can be defined as retrieving information, forming broad understandings, developing interpretations, contemplating and evaluating text content and contemplating and evaluating text forms. text and literal comprehension.

Furthermore, the OECD (2017) stated that there are several processes in the assessment of reading literacy, namely taking information, forming a broad understanding, developing interpretations, reflecting on and evaluating the content of the text and reflecting and evaluating the form of the text and understanding. literal information. For reading literacy reporting, these six processes are organized into three broad process categories.

First, access and grab. Accessing and retrieving involves going to the provided information space and navigating in that space to find and retrieve one or more different pieces of information. Accessing and retrieving tasks can range from finding individual pieces of information, such as details an employer requires from a job advertisement, to finding a phone number with multiple prefixes, to finding certain facts to support or refute a claim someone has made. While retrieval describes the process of selecting the required information, accessing describes the process of getting to the place, the information space, where the required information is located. Both processes are involved in most access and retrieval tasks in PISA.

Second, integrate and interpret. Integrating and interpreting involves processing what is read to build an internal representation of the meaning of the text. Integrating focuses on demonstrating an understanding of the coherence of the text and involves the process of understanding the internals of the text. Integrating involves connecting various pieces of information to make meaning, whether that is identifying similarities and differences, making degree comparisons, or understanding cause and effect relationships.

Third, Reflection and evaluation. Reflecting and evaluating involves taking knowledge, ideas or attitudes outside the text to relate the information given in the text to one's own conceptual frame of reference and experience. Reflecting items can be considered as items that require readers to consult

their own experience or knowledge to compare, contrast or hypothesize. An evaluation item is an item that asks the reader to make a judgment based on an out-of-text standard. Reflecting and evaluating the content of the text requires the reader to relate the information in the text with knowledge from outside sources.

Then, according to the OECD (2018), the reading literacy framework defines several cognitive processes which include seeking information, understanding, and evaluating and reflecting. First, search for information, which consists of accessing and retrieving information in the text, searching for and selecting relevant texts. Second, understand, it consists of literal information, integrating and generating conclusions and integrating and generating conclusions across multiple sources. Third, evaluation and reflection, namely assessing quality and credibility, reflecting on content and form and detecting and dealing with conflicts.

Besides Rachel (2011), another aspect is the cognitive skills used by the reader in processing the text. There are five aspects that guide the development of reading literacy assessment tasks, namely retrieving information, forming broad understanding, developing interpretations, planning and evaluating text content, and reflecting and evaluating text form.

In reading activities the process of cognition is experienced by students. The cognitive process itself is divided into three first, namely receiving information such as reading and retrieving the information contained in the text, and looking for the same text as the text being discussed. Second, understanding information such as explaining the literal meaning of the text, and drawing conclusions from one source or from various other sources. Third, evaluate and reflect on things such as assessing quality and credibility, reflecting on content and form, and calculating and solving a problem.

Cognitive theory by Piaget in Thahir (2018) stated that cognitive theory is how a child gives views and gets used to things that are in their environment. Piaget also explained that the combination of brain development and experiences that have been passed by a child in adapting to his environment produces this cognitive. Piaget divided the stages of cognitive development into four parts, starting from an individual's birth to adulthood. The

first stage is the sensori-motor stage which starts from the individual born until he is two years old. This stage is the stage where the individual realizes that something exists. The second stage is the preoperational stage which starts from the individual aged about two years to the age of seven. This stage is the stage where an individual is able to describe the things that exist in his environment using the abilities or symbols he already knows. The third stage is the operational stage which starts from the age of seven years until the age of eleven. This stage is the stage where the individual is able to use his logic to think. The last stage is from the age of eleven until the person grows up. This stage gives them the ability to be able to solve problems and think better in making decisions. According to Piaget, the change in thinking from formal to operational is a very significant change that occurs during adolescence.

According to Sujiono (2015), the ability of an individual to know, study, and solve a problem is cognition and intelligence is closely related to one's intelligence. The factors that affect the cognitive of an individual is the first influenced by heredity. Hereditary factors greatly affect individual cognitive abilities that are equal to 75-80%. The second is environmental factors. Third, the maturity factor which is closely related to the age of an individual. Fourth, namely the factors that shape the child outside of himself such as formation through school and natural formation. The fifth is the interest and talent factor. Interest can be interpreted as an impulse that exists in a person's soul and talent is an innate that has existed since a person was born. The last factor is freedom. Freedom means how a person can be free in thinking and acting.

Often there is a visible difference between intelligence between female and male students. Widadah (2015) found that girls only felt calm in planning, but for the next process they experienced cognitive problems, and boys experienced cognitive problems at every stage of problem solving he went through. Primi, Donati, Chiesi, & Morsanyi (2018), after examining other factors, they found that gender is not a determinant of an individual's intelligence. On the one hand, it can be found that girls are more intelligent than boys. Rosa (2017) found that cognitive intelligence such as estimating, analyzing and interpreting was more controlled by girls.

scores with female students' scores is as follows:

METHOD

The research method used is a descriptive research method with a quantitative approach because it uses numbers, starting from data collection, interpretation of the data, and the appearance of the results. In this study, the writer wanted to know whether it was true that the ability of female students was higher than that of male students and to what extent the cognitive abilities of female students were compared to male students. This approach is also associated with research variables that focus on current problems and phenomena that are happening at the present time in the form of research results in the form of numbers that have meaning.

The population used in this study were 150 8th grade students of SMP 6 Bukittinggi accredited B. The samples used were 30; consisting of 15 male students and 15 female students, using cluster random sampling technique. The instrument used in this study uses a standardized test, namely the 2018 PISA sample which was adopted from the OECD PISA website. Sample Question consists of 3 scenarios. Each scenario consists of 7 questions in the form of simple multiple choice, yes and no, and open response.

RESULTS AND DISCUSSION

From the questions given, male students got the highest score of 76 and female students also got 76. The lowest score of male students was 10; the lowest score for female students is also 10. However, the average of female students is higher than that of male students. As shown in the following diagram:
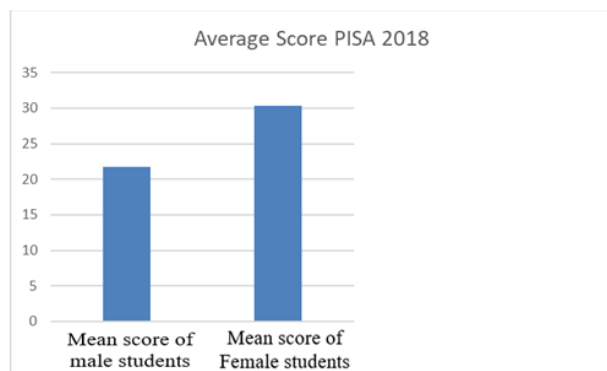

Diagram 1. *Average score PISA 2018*

From the data shown in the table above, it can be explained that the comparison of male students'

Average value

The average score of male students was 25.47 and the number of male students who scored the same and above the average was 4 out of 15 students or 26.27%. Meanwhile, the average score of female students was 37.19 and the number of female students who scored the same and above the average was 10 out of 16 people or 62.50%.

From these data it can be concluded that the average value of female students is higher than the average value of male students. Even the average value of female students is also above the class average, which is 31.52. When compared with individual scores, the number of female students who scored above the class average was 10 people (32.26%) while the number of male students who scored above the class average was only 2 people (6.45%). This finding is in line with PIRLS in 2016, Bijou & Mariem (2018), Yalcin & Bayraktar (2021), girls are better on PISA rather than boys. Syamsuri & Bancong (2022) who stated female students have better ready literacy in PISA than male students do.

Highest value and lowest score

The highest score obtained by male students was 76 as well as the highest score obtained by female students was 76. And it can be concluded that the highest grade in the class was also 76. The number of students who were able to obtain these scores were 1 out of 15 each. male students (6.67%) and 1 in 16 female students (6.26%).

The lowest score obtained by both male and female students is also the same, namely 10, so it can also be seen that the lowest score in the class is also 10. The number of male students who got the lowest score was 1 out of 15 people (6.67%) and the number of female students who got the lowest score were 2 out of 16 people (12.5%). It can be seen clearly that the ability of male students and female students in obtaining the highest and lowest grades is the same. By looking at that case, what has been revealed by Khorramdel, et al. (2022) is true. There is no difference between male and female students in general. The highest scores gotten by male and female students are not only good at reading literacy, but they are smart in all subjects. Therefore, this finding supports the result finding of Pulkkinen & Rautopuro (2022) that understanding

of different subjects also concerns the capability of the PISA test.

Frequency value
The table also presents information on the grades most often obtained by male and female students. A total of 4 out of 16 female students (25%) got a score of 38. A score of 24 was obtained by 3 out of 16 female students (18.75%), 2 out of 16 female students (12.5%) got a score of 10. As for the score of 42, 43, 52, 76, 62, 19, 57 respectively obtained 1 of 16 female students (6.25%)

Meanwhile, 5 out of 15 male students (33.33%) got a score of 24, 4 out of 15 male students (26.67%) got a score of 14, and 2 of 15 male students (13.33%) got a score of 29 and a score of 19, 43, 10,76 respectively obtained 1 of 15 male students (6.67%)

Description of student answers
Based on the results of student answers, the researcher will describe the results of students' answers in answering the PISA 2018 sample test questions. The following is a description of the results of student answers based on question indicators.

Access and retrieve information
Tested on item number 1 and item number 4. In this question, male students and female students have the same ability in answering questions, as evidenced by the fact that there are 2 female students and 2 male students who are able to answer the question correctly. It highlights that both male and female students have the same level in accessing and retrieving information. They have the same ability in accessing and retrieving involves going to the provided information space and navigating in that space to find and retrieve one or more different pieces of information.

Represent literal information
It was tested on items number 2, 8, 11, 15, and 18. In some questions it was seen that female students had the ability to answer questions more than male students. Question number 2 was answered correctly by 3 female students and 1 male student; question number 8 was answered correctly by 7 female students and 2 male students; question number 11 was answered correctly by 10 female students and 5 male students. For boys, question

number 18 was answered correctly by 3 female students and 1 male student, while for question number 15 the number of students who answered correctly was the same, namely 6 female students and 6 male students.

In this cognitive process, female students are superior to male students. It indicates that female students are able to understand the literal meaning of sentences or short sentences, usually a direct or close paraphrase of the information in question with information in a section.

Integrate and generate inferences
Tested on items number 9 and 12. In question number 9 it can be seen that the ability of male students exceeds the ability of female students, as evidenced by 5 male students being able to answer the question correctly and there are only 2 female students whose answers are also correct. This proves that male students have more abilities in integrating and generating conclusions when compared to the 2 indicators at the beginning which were mastered by female students. As for question number 12, both male students and female students who were able to answer correctly amounted to 8 people.

Integrate and generate inferences across multiple sources
It was tested on items number 6, 14, and 19. On the three items it was seen that the ability of female students in answering questions still exceeded male students. Question number 6 was answered correctly by 9 female students and 5 male students, question number 14 was answered correctly by 11 female students and 4 male students, while question 19 was answered correctly by 4 female students and 4 male students. These questions include questions that can be answered by many students, although the ratio of correct answers is still dominated by female students.

Assess quality and credibility
Tested on item number 13, and in this question both female students and male students have the same ability. The number of female students and male students who answered the questions correctly was the same, namely 1 person. This is an interesting finding. Among 15 male and female students, only 1 from each could answer the question. The question is about measuring students' ability in

assessing whether the information in the text is valid, reliable, correct, and unbiased. It shows that most of the students are not able to reflect critically on the content and the form of the text. It indicates some students are able to generate main ideas or make a summary.

Reflect on content and form
Tested on items number 3, 10, 16 and 17. In 3 questions, it can be seen that the ability of female students exceeds the ability of male students. Question number 3 was answered correctly by 3 female students and 4 male students. Question number 16 was answered correctly by 8 female students and 2 male students. While in question number 10, the ability of female students and male students proved to be the same as the number of students who answered correctly 10 female students and 10 male students. Although for other items in this indicator male students do not excel, male students on question number 17 showed abilities above female students with the number of male students who answered correctly as many as 11 people while female students only 9 people.

Detect and handle conflict
It was tested on items number 5, 7, 20 and 21. In the four items, the ability of female students was seen above that of male students. Question number 5 was answered correctly by 5 female students and 1 male student, question number 7 was answered correctly by 3 female students and 1 male student, question number 20 was answered correctly by 10 female students and 6 male students. While question number 21 was answered correctly by 3 female students and 1 male student. It denotes that female students are better in detecting and handling conflict.

In conclusion, it can be noticed that female students dominate in answering PISA questions accurately and they have more appropriate reading skills than male students as an entirety, as seen from all the indicators of questions in PISA. In total, there are 7 indicators in the PISA question. For the first indicator, namely access and retrieve information, the capability of female and male students is the same. For the represent literal information, integrate and generate inferences across multiple sources, assess quality and credibility, reflect on content and form, and detect and handle conflict, dominated by female students.

Only on the integration and generating inferences, male students can answer accurately more than female students.

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