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Critical Thinking Ability Based on Student Gender in Biology Learning at SMA Negeri 4 Pekanbaru

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Abstract: One of the goals of 21st Century education is to develop students' thinking skills, one of which is critical thinking skills. The diversity of student problems in schools is one of the topics of discussion and research in the world of education. One of the main learning processes is student differences, especially gender differences. The influence of gender or gender differences on various student abilities has been revealed in previous research. This research was conducted at SMA Negeri 4 Pekanbaru. The population in this study were students of class XI MIPA. The research method used is descriptive method, which is a research method used to describe problems that occur at the present time or are ongoing, aiming to describe what happened as it should have been when the research was conducted. According to the graphic data above, the highest score interpretation is found in female students, namely the range of values 79-65 in the moderate category and the number of female students who get this range of values is 10 out of 19 people. Meanwhile, only 8 out of 17 male students obtained a score range of 65-79. Based on the results of the research that has been carried out and the discussion that has been presented, it can be concluded that there are gender differences, female students get a percentage of 26.7% with 3 indicators of critical thinking skills while male students get a percentage of 14.5% with 2 indicators of critical thinking skills. The percentage of female students has a higher critical thinking ability than male students.

Keywords: critical thinking ability, gender, learners

INTRODUCTION

Education in general is a conscious and planned effort to realize learning atmosphere and learning process for students to be active develop his potential to have religious spiritual strength, self-control, personality, intelligence, noble character, and good skills necessary for himself, the community, the nation and the State (Law No. 20 year 2003) in (Mirnawati, 2017) .

One of the goals of 21st Century education is to develop students' thinking skills, one of which is critical thinking skills. Strengthening character education in schools must be able to foster students' character to be able to think critically, creatively, be able to communicate, and collaborate, which is able to compete in the 21st century. This is in accordance with the four competencies that students must possess in the 21st century, called 4C, namely critical thinking. and solving problems (*Critical Thinking and Problem Solving*), creativity (*Creativity*), communication skills (*Communication Skills*), and the ability to work together (*Ability to Work Collaboratively*) (Fridanianti , et al ., 2018).

The ability to think critically reflects a reflective, logos, rational thought process, interpreting, and gathering information in making a decision according to (Daryanes & Putra, 2021). Students must have critical thinking skills as the main provision in preparing for changes in an increasingly modern and developing era (Reichenbach, et al., 2019) . Every human being has the potential to grow and develop into a critical thinker because actually thinking activities have a relationship with self-management patterns (*self-organization*) that exist in every creature in nature including humans themselves (Siti, 2010: 9).

The diversity of student problems in schools is one of the topics of discussion and research in the world of education. One of the main learning processes is student differences, especially gender differences. The influence of gender or gender differences on various student abilities has been revealed in previous studies. According to Crawford, et al, in (Mahanal, et al., 2018) found female students have the ability to ask more precise and credible questions than male students, which means female students have higher critical thinking skills than male students. In other words , gender influences critical thinking skills. The thinking process between men and women is also thought to have differences. According to Crawford in (Indah, et al, 2017: 467) female students have the ability to ask questions that are more precise than male students, which means that female students have higher critical thinking skills than male students. Research conducted by Mahanal (2011) states that gender influences students' critical thinking skills.

Based on the description of the background above, in which researchers have the desire to know students' critical thinking skills based on gender as one of students' understanding in supporting students' activeness in learning. So the researcher is interested in conducting research entitled "Gender-Based Critical Thinking Skills in Students in Biology Learning at SMA Negeri 4 Pekanbaru".

METHOD

This research was conducted at SMA Negeri 4 Pekanbaru. The population in this study were students of class XI MIPA $_4$ for a total of 36 students with 17 male students and 19 female students.

The research method used is descriptive method, which is a research method used to describe problems that occur at the present time or are ongoing, aiming to describe what happened as it should have been when **the research** was conducted. According to Nazir (in Tizar, 2023; 5) descriptive research examines the status of human groups, objects, conditions, systems of thought or current events with the aim of making systematic, factual and accurate descriptive of the facts studied.

Data processing

Interviews are one of the most commonly used data gathering methods in social research. Interviews are used to obtain information to fulfill research objectives and then identify existing problems. Interviews were conducted with Biology subject teachers and class XI MIPA students at SMA Negeri 4 Pekanabaru so that the objectives and data obtained were good and accurate.

The test is a procedural measuring tool that is used to find out or measure something in an atmosphere, in ways and rules that have been determined. Tests can also be used to measure the amount of knowledge an individual acquires from a subject matter which is limited to a certain level according to (Magdalena, et al., 2020) .

RESULTS AND DISCUSSION

This descriptive research was conducted at SMA Negeri 4 Pekanbaru. The research is aimed at describing and describing existing phenomena and paying more attention to the characteristics, quality, interrelationships between learning activities. The object of this research is the ability to think critically towards students based on gender in Biology learning at SMA Negeri 4 Pekanbaru.

The data that has been obtained in this study are the answers from the respondents to the distributed test instruments. The results of the instrument test conducted at Pekanbaru 4 Public High School with students obtained the following results.

Table 1. Criteria for interpreting students' critical thinking skills

No	Interpretation	Category
1	90-100	Very high
2	80-89	Tall
3	65-79	Currently
4	50-64	Low
	0-54	Very low

Table 2. The range of values and criteria for the values of male students.

Value Range	Criteria	Number of Students	Percentage
0-54	Very low	2	12%
55-64	Low	7	41%
65-79	Currently	8	47%
80-89	Tall	0	0%
90-100	Very high	0	0%
The number of students		**17**	**100%**

Table 3. Answer indicators for male students' test instruments

Question Indicator	Number of Students	Percentage
1	5	30%
2	3	18%
3	2	11%
4	4	23%
5	3	18%
Amount	**17**	**100%**

Table 4. The range of values and criteria for the values of female students

Value Range	Criteria	Number of Students	Percentage
0-54	Very low	2	10%
55-64	Low	7	37%
65-79	Currently	10	53%
80-89	Tall	0	0%
90-100	Very high	0	0%
The number of students		**19**	**100%**

Table 5. Answer indicators for female students' test instruments

Question Indicator	Number of Students	Percentage
1	6	32%
2	3	15%
3	1	5%
4	5	27%
5	4	21%
Amount	**19**	**100%**

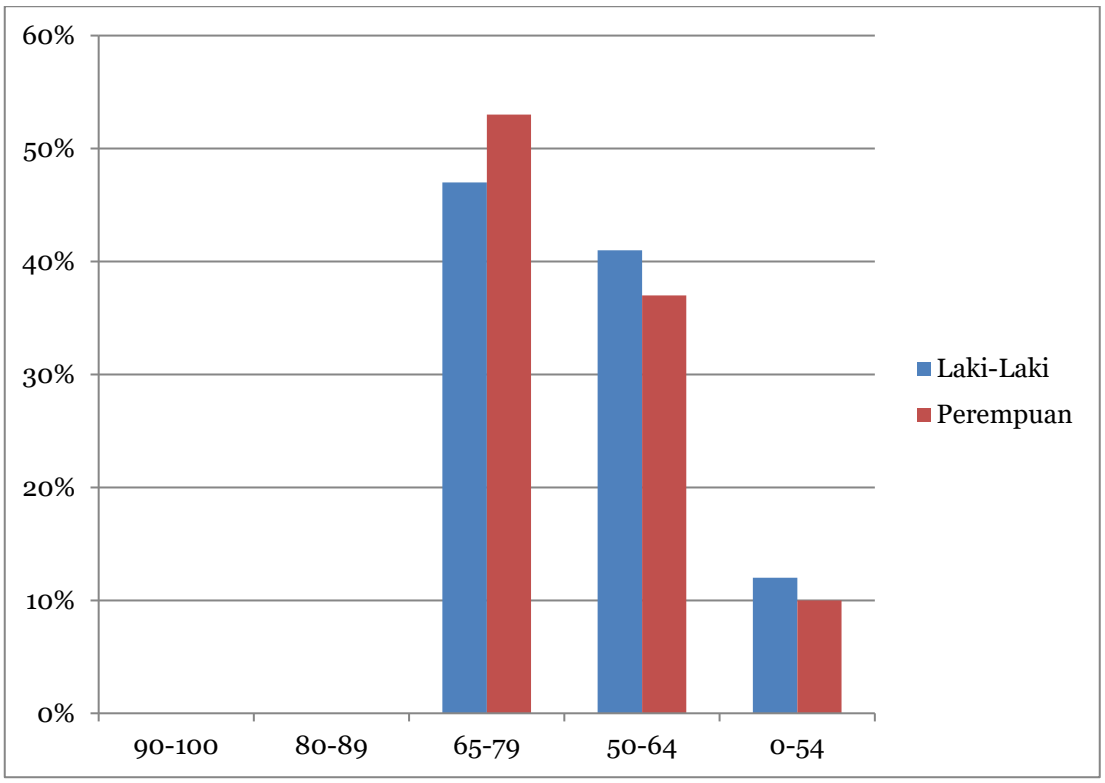

Figure 1. Graph of Interpretation of Student Question Test Instrument Response Value Results at SMA Negeri 4 Pekanbaru

According to the graphic data above, the highest score interpretation is found in female students, namely the range of values 79-65 in the moderate category and the number of female students who get this range of values is 10 out of 19 people. Meanwhile, only 8 out of 17 male students obtained a score range of 65-79. Female students were found to do well in class than male students. According to Unity, female students are claimed to have better learning skills compared to boys; O'Dea in (Muspiroh, 2020). Female students (regardless of educational background) were found to be more active in the academic field than male students according to Economists in (Muspiroh, 2020). It is a fact that male students have a lot of knowledge about the technical world and their level of intelligence is completely different from that of girls but still, the difference between the values is the same and still in position. Values in the academic field (whether students come from an educational institution or several other educational stages) have created a distinctive pattern that female students are better than male students according to Coskun in (Muspiroh, 2020(Muspiroh, 2020).

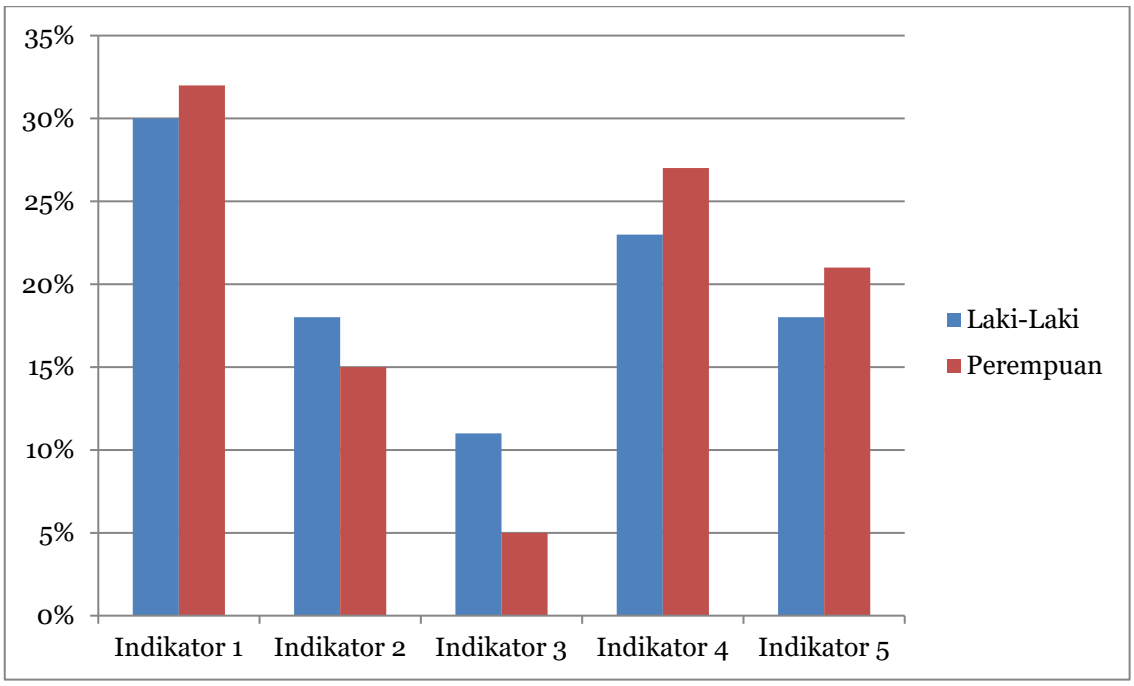

Figure 2. Graph of the Percentage of All Student Question Test Instrument Response Indicators at SMA Negeri 4 Pekanbaru

Then in the graphical data the highest percentage of indicators was obtained by female students, namely indicator 1 providing a simple explanation (*Elementary Clarification*) with a percentage of 32%, indicator 4 making advanced explanations *(Advanced Clarification)* with a percentage of 27%, and indicator 5 strategies and tactics (*Strategies and Tactics*) with a percentage of 21%. Whereas male students only outperformed two indicators, namely the Basic Support Skills indicator *with* a percentage of 18%, and indicator 3 concluded 11% *(Inference)*. Gender differences can be seen that female students have higher critical thinking than male students. This can be seen from the achievement of the average per-indicator score achieved in answering the questions. This is because female students are more detailed and thorough in answering questions, because women's thinking patterns are different from men according to (Erna, 2019: 70). According to Ennis in A'yun, Hasasiyah, Subali, & Marwoto (2020); students' critical thinking skills regarding indicators for managing strategies and tactics, there are two sub-indicators that determine actions and interactions with other people. These differences in ability are related to differences in the structure of the language processing part of the brain between men and women. According to Zaidi (in Yanti, et al., 2019) men and women are different in terms of the learning process and language development. Several studies show that female students have better verbal abilities. The same thing was also stated by Shaywitz (in Yanti, et al., 2019) that during phonological tasks, brain activation in men focuses on the frontal gyrus area, while in women shows an activation pattern that shows a greater distribution of nerves in both left inferior frontal gyrus. and right. This information provides evidence of differences in the level of language processing in men and women.

To be able to improve students' critical thinking. The Discovery Learning learning model can improve thinking skills students' criticism if each syntax is implemented well (Wulandari et al., 2020).

According to the teacher, when students are asked questions, only 2 to 3 people answer. Then when the teacher gives students the opportunity to ask questions about things they don't understand, it is also very rare for students to ask, even in every lesson students often don't ask (Jannah et al., 2023).

The results of the study showed that there was a significant correlation between critical thinking and creativity when Digital Mind Maps were integrated into Problem-based Learning. In addition, it was also found that both variables could be empowered simultaneously in the classroom and thus concurrent evaluation could be performed to both critical thinking and creativity. It is highly recommended for future researchers to consider other variables that may also affect the development of students' critical thinking and creativity (Hidayati et al., 2019).

CONCLUSION

Based on the results of the Research on Critical Thinking Ability Based on the Gender of Students in Biology Learning at SMA Negeri 4 Pekanbaru which has been carried out and the discussion that has been presented, it can be concluded that there is a gender difference, in female students obtaining a percentage of 26.7% with 3 indicators of thinking ability critical while male students get a percentage of 14.5% with 2 indicators of critical thinking skills. So, judging from the percentage results, it was found that female students had higher critical thinking skills than male students.

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