BIO-INOVED : Jurnal Biologi-Inovasi Pendidikan
Volume 3, Issue 3, October 2021 page. 179-182
https://ppjp.ulm.ac.id/journal/index.php/bino

OPEN ACCESS JOURNAL
P-ISSN : 2684-9062| E-ISSN : 2714-9803
DOI: 10.20527/bino.v3i3.10964

Gender Differences Regarding the Ability to Think Critically in High School Biology Subjects during the Covid-19 Pandemic

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Article Information

Keyword:
Critical Thinking Skills
Biology Subject
GenderDifference

Kata Kunci:
Kemampuan Berpikir Kritis
Mata Pelajaran Biologi
Perbedaan Gender

History:
Received : 26/06/2021
Accepted : 19/10/2021
Published : 27/10/2021

Abstract

The ability of critical thinking is very important to have. If the students have an ability of critical thinking, they students can solve the problems that facing them on the lesson study especially biology. This study aims to determine students critical thinking skills based on the gender of high school biology subjects during the Covid-19 pandemic. The data were analyzed descriptively with a quantitative approach. The population in this study was all students of class XII science high school. The sample of this research was taken by simple random sampling by means of lottery as many as 35 students. The results showed that the average value of women's critical thinking skills was 77 and was in the medium criteria. While the average value of male critical thinking skills is 64 and is in the low criteria. It can be concluded that the ability to think critically based on gender is higher for female students than male students. From the test result show the value of sig. (2-tailed) obtained t count of 2.118 sig at 0.042 which means that there is a significant difference in critical thinking ability of male and female students.

Abstract

Kemampuan berpikir kritis sangat penting dimiliki. Jika siswa sudah memiliki kemampuan berpikir kritis, siswa dapat memecahkan persoalan-persoalan yang dihadapi dalam pelajaran terutama dalam pelajaran Biologi. Penelitian ini bertujuan untuk mengetahui kemampuan berpikir kritis siswa berdasarkan gender mata pelajaran biologi SMApada masa pandemi covid 19. Data dianalisis secara deskriptif dengan pendekatan kuantitatif. Populasi dalam penelitian ini adalah seluruh siswa kelas XII IPA SMA. Sampel penelitian ini diambil secara *simple random sampling* dengan cara undian sebanyak 35 siswa.Hasil penelitian menunjukkan bahwa rata-rata nilai kemampuan berpikir kritis perempuan 77 dan berada pada kriteria sedang. Sementara rata-rata nilai kemampuan berpikir kritis laki-laki 64 dan berada pada kriteria rendah. Maka dapat disimpulkan bahwa kemampuan berpikir kritis berdasarkan gender lebih tinggi siswa perempuan daripada siswa laki-laki. Dari hasil pengujian menunjukkan nilai sig. (2-tailed) diperoleh t hitung sebesar 2,118 sig pada 0,042 yang artinya terdapat perbedaan yang signifikan kemampuan berpikir kritis pada siswa laki-laki dan perempuan.

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How to cite: Harun, S. C., & Hasruddin, H. (2021). Gender Differences Regarding the Ability to Think Critically in High School Biology Subjects during the Covid-19 Pandemic. *BIO-INOVED : Jurnal Biologi-Inovasi Pendidikan*, *3*(3), 179-182.

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A. Introduction

According to Rini (2017) that gender factors make the main discussion interesting to study in improving the quality of the science-biology learning process. Differences in treatment between men and women at home and at school have a major influence on the identity and academic development of students (Cahyono, 2017). In the learning process, the main thing is that differences in students must be recognized in the world of education, gender differences are quite present, especially in public schools.

Boys are usually superior in skills than girls. However, girls are said to be superior in terms of verbal ability, because boys often experience language problems. Biologically, the differences in abilities involved in language processing can be attributed to the difference in the female and male brain is gender. In the world of education in schools there is a relationship between gender and critical thinking skills. That boys show more problems than girls while girls are better at doing oral tasks in the early years and can be maintained (Yanti et al, 2019).

Observation using 16 essay questions based on critical thinking indicators according to Fascione based on critical thinking ability indicators, where from the results of the average score obtained from class (XI MIPA) that the female student group had 57.69% higher results than the male students that is the result of the value of 46.54% (Ricketts & Rudd, 2004). From the results obtained, it can be seen that all critical thinking indicators have not been maximally achieved. These results indicate that there are different abilities between male and female students from the aspect of critical thinking.

According to Muhlisin (2016), students' thinking is not critical because there are still students' arguments that are not appropriate; provide fewer logical assumptions and unconditional evaluations based on facts. In fact, in school, biology learning has not increased critical thinking skills and abilities. So that student learning outcomes are still relatively low. Learning that expects students to absorb information passively and then remember it when taking tests. This kind of learning causes students not to gain experience to develop critical thinking skills. This condition causes low critical thinking skills (Yanti et al, 2019).

Based on the results of interviews with biology teachers at SMAN 2 Tanjungbalai, it was found that there are still problems, one of which states that students' ability in problem solving and critical thinking is still low, this is obtained from qualitative information about critical thinking skills, metacognitive abilities, and student learning outcomes. still relatively low. Almost on average students have difficulty learning Biology, namely in growth and development material, even though the material is one of the materials that discusses problems that often occur in everyday life, but in fact in studying growth and development material the daily test scores obtained relatively lower students. In addition, there has never been a study to measure critical thinking in the school. The purpose of this study was to determine the students' critical thinking skills based on gender during the covid 19 period at SMA Negeri 2 Tanjungbalai.

B. Method

This research is descriptive research, that is, research is directed to dig up data from actual conditions. The data in question is students' critical thinking skills in learning growth and development. As for the type of research, descriptive research is exploratory or develop-mental (Arikunto, 2018).

Research Time and Place

The time of the research was carried out in July-December 2020. The research was carried out in class XII science at SMA Negeri 2 Tanjungbalai. The population in this study was all students of class XII IPA SMA Negeri 2 with a total of 35 students, consisting of 16 male students and 19 female students.

Data Collection Instruments and Techniques

The instrument used in this research is a test instrument that aims to observe the process of the stages carried out by students in solving questions about biology lessons.

Data collection techniques using Google forms. Google forms will automatically save the results of student work and students can download in the form of an excel document complete with the scores obtained and the answers chosen by the students.

Data Analysis Technique

According to Arifin quoted in Sianipar (2015) that the category of students' critical thinking abilities can be seen in Table 1.

Table 1 Criterion for Students' Critical Thinking Ability Level

Score	Criteria
90 – 100	Very High
80 – 89	High
65 – 79	Medium
≤ 64	Low

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The research data were grouped by gender and then averaged and then compared 1. Then a statistical test in the form of a t-test (Independent Sample t-test) was carried out to see whether there was a significant difference in students' critical thinking skills based on gender.

C. Results and Discussion

Based on Table 2, it is found that the critical thinking ability of female students is higher than male students with an average score of 77 and is in the medium criteria. . This is because female students are more detailed and thorough in answering questions, because women's thinking patterns are different from men's. In the brain, the brain regions associated with language function work harder which results in higher language skills for women than men. Language is a tool used to convey thoughts. The ability to use language with good grammar is an indicator of high thinking ability. Women are more detailed in answering each question, so that the value obtained for each question is higher than men.

Table 2 Differences in Critical Thinking Ability Based on Gender

No	Gender	Average	Criteria
1	Man	64	Low
2	Woman	77	Medium

These findings are in line with previous research conducted by Ricketts & Rudd (2004) which stated that women's scores were higher than men's in terms of analytical critical thinking skills. Women were also rated higher than men in the ability to make conclusions, which means women better able to identify the elements needed to draw conclusions, to develop hypotheses, to consider relevant information.

Halpern (2000) and Halpren (2004), find that men are better at manipulating visual images and numerical abilities, while women generally do better on verbal skills tests. Women consistently show superior verbal skills, are more expressive and richer vocabulary. The results of research by Leach & Good (2011) shows gender and major college significantly affect the average critical thinking ability.

The results of the relevant research above are in line with the research that has been carried out, the researchers used a research instrument in the form of a critical thinking ability test that contained information in order to draw conclusions. The results showed that the critical thinking ability of female students was superior to that of male students. girls are better able to identify the elements needed to draw conclusions, to formulate hypotheses, to consider relevant information, and generally do better on tests of verbal ability. While male students are better at manipulating visual images and numerical abilities such as counting.

Table 3 Independent Samples Test

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Nilai	Equal variances assumed	7.816	.009	-2.118	33	.042	-13.30263	6.28049	-26.08039	-.52487
	Equal variances not assumed			-1.960	16.665	.067	-13.30263	6.78826	-27.64659	1.04132

This is evidenced by the statistical test in the form of a t test that has been carried out. The test results show the value of sig. (2 – tailed) obtained t count of 2.118 sig at 0.042, which means that there is a significant difference in critical thinking skills in male and female students can be seen in Table 2.

The results of this study are in line with the research conducted by Hasruddin & Lestari (2020) which found that female students were higher than male students, namely female students obtained 78.67% and male students obtained 47.07%. Based on the Independent Sample t-test between gender and scientific ability, the t-count is 11.410 and the t-table value is 1.98 with a df of 98 and a significance level of 0.140. This proves that t count > t table (11.410 > 1.98) at a significance level of 5%. Thus there is a difference between male students and female students where female students are higher than male students.

The results of this study are in line with the research conducted by Yanti et al (2019) which showed that there were gender differences in female students obtaining an average of 14.05 while male students obtained an average of 13.15. From the explanation that there is a gender difference, it can be seen that female students think critically more than male students. This can be seen from the achievement of the average score because female students are more detailed and thorough in answering questions and because the mindset of women is different from that of men. male. The ability to use language with good grammar is an indicator of high thinking ability.

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According to Hoang (2008), gender indirectly affects learning motivation and learning outcomes, where female students have more active participation and learning methods so that they are able to have higher learning outcomes than male students who are passive in the learning process. According to Wahyudi (2014) this is due to the monotonous learning process in the classroom and the existence of different psychological and physiological differences between genders that can affect the learning process and learning outcomes.

So from the explanation that there is a gender difference, it can be seen that female students think critically more than male students. This can be seen from the achievement of the average score because female students are more detailed and thorough in answering questions and because the mindset of women is different from that of men. male. The ability to use language with good grammar is an indicator of high thinking ability.

D. Conclusion

The critical thinking ability of female students is higher than male students with an average score of 77 and is in the medium criteria. Meanwhile, the average value of critical thinking ability of male students is only 64 and is in the low criteria. So it can be concluded that the ability to think critically based on gender is higher for female students than male students. From the test results show the value of sig. (2 – tailed) obtained t count of 2.118 sig at 0.042 which means that there is a significant difference in critical thinking abilities of male and female students. It is hoped that by knowing the condition of critical thinking skills of SMA Negeri 2 Tanjungbalai students can design and develop learning that facilitates students to practice critical thinking thus students will get used to critical thinking.

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