

## Analysis of Affective Assessment in Measuring Elementary School Students' Critical Reasoning Ability in View of Gender

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### ABSTRACT

Affective assessment in looking at elementary school students' critical reasoning abilities is considered to need to be analyzed as a complex process of changing students' attitudes in implementing the Pancasila student profile. Analysis involves receiving and mastering data, data analysis, and data evaluation, which must be taught to students because these skills are very necessary in life. The aim of the research was to analyze the affective assessment of elementary school students' critical reasoning abilities in terms of gender. The research method used is quantitative research. The research subjects were 32 students in Class 5 of Keraton 1 State Elementary School for the 2024/2025 academic year, divided into 12 male students and 20 female students. Data analysis used the independent t test. The results of the research show that there is no significant difference in the form of affective assessment of critical reasoning ability, in terms of the gender of class V students. The results of the independent t test obtained a significance value of  $0.204 > 0.05$ , meaning that the average critical reasoning ability of women (3.205) is higher than men (3.085) with a difference of 1.120 which is considered not significant. The results of critical reasoning indicators (seeking information, assessing information, making conclusions, and making decisions) show that there are no significant differences based on student gender. The implication of the research is that teachers are able to improve critical reasoning skills, researchers can then analyze other factors or develop other research objects.

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## 1. INTRODUCTION

The emergence of the idea of the importance of cultivating character education in the world of education in Indonesia is one of the ideas for improving the quality of education today. The word improve is not a claim that current education is bad, but refers to the idea of improving the quality of education itself. Asnani, et, al (2020) said, character education is an effort to educate children so they can make wise decisions and practice them in their daily lives, so they can have a positive influence on their environment. This proclamation is considered to be less successful in delivering the nation's generation into dignified individuals. The world of Indonesian education is only capable of producing human graduates with an adequate intellectual level. Many school

graduates have high grades, are intelligent, brilliant, and are able to solve subject questions very quickly, but unfortunately quite a few of them do not have intelligent behavior and lack a good mental personality.

The Ministry of Education and Culture (2017) stated that the outline of education makes people have character, noble people and humane people. Furthermore, Dahliyana (2017) also stated that the world of education philosophically viewed and expected as a tool or container to educate and shape human character to be more good (humanization). This situation is caused by the imperfect implementation of character education in schools. As understood by experts, it is explained in Dahliyana (2017), that at a micro level, character development is divided into four pillars, namely teaching and learning activities in the classroom, daily activities in the form of cultural development in formal and non-formal education units, co-curricular, extra-curricular activities, and activities at home. and society. Ismail et al, (2021) explained that strengthening student character education can be realized through various Ministry of Education and Culture policies which are centered on efforts to realize Pancasila Students. Starting from basic education to higher education. Diputera et al, (2022) and the Ministry of Education and Culture (2020) explain the six dimensions of Pancasila Students, namely: 1) critical reasoning; 2) creative, 3) independent; 4) believe; have faith in God Almighty, have noble character; 5) work together; and 6) global diversity.

A quality learning process can certainly produce good quality education. The quality of learning is currently still a relatively prominent problem in efforts to improve the quality of the national education system. The government has made various efforts to improve the quality of education in Indonesia. Wijayanti, et al (2022) said, one of the efforts is to carry out reforms in terms of the curriculum. Widodo, (2019) explained that education today needs to teach many skills needed to fulfill functions in various aspects of life today. These skills, according to Nata & Sofyan (2014), include basic skills, reading, writing, computers as well as various professional skills such as communication, creative thinking, critical reasoning, and understanding yourself well. Furthermore, according to Ardiyanti (2016), critical reasoning is a skill that must be developed in students. In fact, Usman, et al (2021) explained that there are still teachers who use conventional lecture methods in learning. Furthermore, Pujiasih (2020) continued, this is a challenge for implementing critical reasoning learning for students. Naziah, et al (2020) explained that during learning using the lecture method, the learning activity of student participants could not be fully optimized. Lie (2007) explains that this happens because teachers only transfer knowledge from teachers to students.

Hasmi, et. al. (2023) explained, in schools, critical reasoning skills are something that is important to be taught, instilled and developed so that students can face various problems that occur around them well, skillfully and critically. This means that learning is not just a process of transferring theory, but a transfer process accompanied by skills that can connect theory with real problems that occur every day. So, an atmosphere can be built and meaningful learning can be created. Faizi (2023) said, the Pancasila student profile is an effort to improve the level of education in Indonesia, which currently places character on a high priority in developing character that is in line with Pancasila values.

Fidia, et al (2022) explained that in the assessment process teachers often experience difficulties in determining measurement aspects and the level of difficulty of questions, so that the test question instruments created are only in cognitive domains C1 to C3. Meanwhile, the ability to solve problems through a critical reasoning process that students must have in solving a problem is not only cognitive ability, memorization and understanding, but also analysis, synthesis, evaluation and application skills. Therefore, instruments are needed that can train and familiarize students in honing critical reasoning skills, so that students are expected to get used to practicing critical reasoning in solving problems in learning at school and in everyday life at home.

Khasanah & Muthali'in (2023) said, to face the challenges of changing times, critical reasoning skills are needed. A person's intellectual maturity is demonstrated by critical reasoning, and this is really needed by elementary school students. Several opinions regarding critical reasoning indicators are expressed as follows. According to Minister of Education and Culture Regulation No. 22 (2016), measuring the value of critical reasoning uses indicators: 1) Seeking Information; 2) Assess Information; 3) Make Conclusions; and 4) Making decisions based on gender. Therefore, researchers use critical reasoning value measurement instruments as a tool to collect student data regarding their critical reasoning. Shamini & Rosyidi, (2021) confirmed that the use of instruments to measure critical reasoning abilities can contribute to the development of students' character based on gender.

Nurrahman (2015) said, according to brain literacy theory, girls excel in the abilities of the left hemisphere of the brain. Women tend to perform better than men on verbal tasks, including verbal fluency, and tasks of memory and conceptual speed. Meanwhile, men tend to score higher on numerical tasks and a number of other perceptual tasks, including orientation and spatial visualization, because men's brains develop specifically in the right hemisphere. Critical reasoning abilities are also influenced by gender. According to Ekawati & Wulandari et al (2011), in their research, men and women are biologically different. This difference is clearly visible in the reproductive organs. The biological differences between men and women are caused by the presence of different hormones. This difference results in different behavior. Apart from biological factors, other factors

also influence student learning achievement, namely psychological factors. Psychologically, men and women are different. Psychological factors are related to intelligence, attention, interest, talent, discipline, maturity and readiness.

So based on the conditions above, research needs to be carried out to analyze the form of affective assessment of critical reasoning abilities in terms of students' gender. The analysis will also look at the following indicators: a) seeking information; b) assess information; c) make conclusions, and d) make conclusions that make up the critical reasoning ability instrument.

## 2. METHOD

The research method used was quantitative research, which was carried out on the students of Perbutulan State Elementary School 1, Cirebon Regency, in the Even Semester of 2023/2024. The data collection technique was carried out by distributing questionnaires to students. The research instrument focuses on the use of questionnaires, which contain 4 indicators with 20 statement items. Next, a normality test and independent t test were carried out. Based on the research objective, namely analyzing students' critical reasoning abilities in terms of type. Students are given a questionnaire consisting of 20 critical reasoning statements with 4 indicators: seeking information, assessing information, making conclusions, and making decisions. The results of filling out the student questionnaire are then grouped into male and female groups. Based on the data obtained from each group of each gender, the critical reasoning abilities of the male and female groups were then analyzed.

## 3. RESULT AND DISCUSSION

### Instrument Indicator

Indonesian students who reason critically are able to process information, both qualitative and quantitative, objectively, build relationships between various pieces of information, analyze information, evaluate and conclude. Critical reasoning is divided into four indicators, namely seeking information, assessing information, making conclusions, and making decisions, which consists of 20 statement questions. Critical reasoning ability in the form of a questionnaire containing 4 indicators of critical reasoning ability, the number of items for two indicators is 20 items. Critical reasoning is divided into four indicators, namely seeking information (1,2,3,4,5), assessing information (6,7,8,9,10), making conclusions (11,12,13,14,15), and make decisions (16,17,18,19,20). The results of the Aikens test were calculated with a minimum score of 0.667 on number 13 to a maximum score of 1.000 on numbers 1, 7 and 18. So it can be concluded that all critical reasoning items totaling 20 statements are declared valid.

### Validity Test

Testing with construct validity was carried out to determine the value of the Kaiser-Meyer-Olkin number (KMO) Measure of Sampling Adequacy and Bartlett's Test of Sphericity, as well as the factor loadings of each item. Factor analysis of the data is a variable feasibility test, namely by looking at the resulting values in the KMO table and Bartlett's Test of Sphericity. If the KMO value obtained is more than 0.50 then the variable is declared feasible and can be analyzed at the next stage. The results obtained from the output of KMO and Bartlett's Test of Analysis of Affective Assessment of Critical Reasoning Ability in View of Students' Gender at SMAN 5 Yogyakarta Rumtini, Kasimin, Ease Arent, Abdul Jalil 118 Academic Discourse: Educational Scientific Magazine, 6(2), 2022, pp. 115 – 120 Sphericity is 0.886 with a significance of 0.000 with a Chi-Square of 147.48 for 20 appropriate statement items.

### Reliability Test

To determine the reliability of the question items, this reliability test uses 20 valid statements and invalid statements are not included in the calculation. In calculating the reliability value, researchers used the Cronbach's Alpha formula with the SPSS 24.0 For Windows program. The results of the reliability test calculation for the 20 statement items show a Cronbach Alpha coefficient value of 0.929. An instrument is declared reliable if it has a Cronbach's Alpha value of more than 0.700. The measurement instruments that have been created and have been tested can be declared reliable.

### Normality Test

Normality testing on the distribution of affective assessment data on critical reasoning abilities was carried out to determine the normality of the data, carried out using the Kolmogorov Smirnov Test which was analyzed with the help of SPSS 24.0 software. Statistical rules stipulate that data is normally distributed if the significance value of p is above 0.05 ( $p > 0.05$ ), if it is below 0.05 then the data is not normally distributed. The normality test results are shown in the table 1.

Table 1. Kolmogorov Smirnov normality test results

Indicator/variable	N	P Sig	Information
Searching for information	132	0,132	Normal
Assess information	132	0,101	Normal

Indicator/variable	N	P Sig	Information
Make conclusions	132	0,186	Normal
Make decision	132	0,193	Normal
Critical reasoning	132	0,123	Normal

The results of the normality test using the Kolmogorov Smirnov test is because  $N > 50$  in the table 1 above shows a significance value of  $p > 0.05$ . This means that the data on the affective assessment of critical reasoning ability and its indicators are normally distributed, then the second prerequisite test is carried out, namely the homogeneity test on the critical reasoning ability data based on the gender of the male and female groups.

### Homogeneity Test

The homogeneity test of affective assessment data on critical reasoning abilities based on gender of male and female groups was tested using Levene's statistics. Table 2 below shows the results of the homogeneity test as follows.

Table 2. Levene's statistical homogeneity test results

Indicator/variable	N	P Sig	Information
Searching for information	132	0,604	Homogeneous
Assess information	132	0,061	Homogeneous
Make conclusions	132	0,072	Homogeneous
Make decision	132	0,302	Homogeneous
Critical reasoning	132	0,081	Homogeneous

The results of the homogeneity test with Levene's statistics are in table 2 above, with the number sig  $0 > 0.05$ . This means that the data on the affective assessment of critical reasoning abilities based on the gender of the male and female groups is homogeneous.

The results of the normality test and homogeneity test of data on the affective assessment of critical reasoning abilities based on the gender of the male and female groups, show that the data is normally and homogeneously distributed. The next step is to carry out a parametric hypothesis test for unpaired samples using the Independent t test, to find out whether there are differences in the affective assessment of critical reasoning abilities based on the gender of the male and female groups.

### Hypothesis Testing

The results of parametric statistical hypothesis testing for unpaired samples using the Independent t test, aims to determine whether there are differences in affective assessments of critical reasoning abilities based on gender in male and female groups. The statistical rule for reading the results of the analysis is, if the results of the Independent t test show a significance value below 0.05 ( $p < 0.05$ ), it means that there are differences in the affective assessment of critical reasoning ability based on type male and female groups. The results of the explanation of the Independent t test presented in table 3.

Tabel 3. Independent t test results

Indicator/variable	Male (average)	Female (average)	Difference average	P Sig	Information
Searching for information	3,076	3,232	1,477	0,117	there is no difference
Assess information	3,024	3,090	0,067	0,577	
Make conclusions	3,070	3,122	0,068	0,503	
Make decision	3,165	3,367	0,061	0,058	
Critical reasoning	3,089	3,207	0,118	0,204	

Based on the results of the Independent t test on the affective assessment of critical reasoning abilities, along with the indicators based on the gender of the male and female groups. It is known that the significance value of  $p$  is 0.206 above 0.05 ( $p > 0.05$ ). These results show that there is no significant difference in the affective assessment of critical reasoning abilities based on gender in the male and female groups. If we look at the median value, the average critical reasoning ability of men is 3.085, which is smaller than the critical reasoning ability of the female group of 3.205 with a mean difference of 0.119. This means that there is no significant difference in the affective assessment of critical reasoning abilities based on gender in the male and female groups.

The results of this study are in line with the results of previous research, conducted by Rubin (1993). This research shows that there are no significant differences between men and women in general aspects of intelligence, although in certain aspects differences can be found between boys and girls. Likewise, Myers' (2006)

findings show that there is no significant difference in critical thinking abilities between male and female students. According to Cahyono (2007), gender differences were not found to be a significant predictor of posttest scores for critical reasoning abilities. In contrast to the results of research conducted by Mahanal (2012) which shows that there is a significant influence of gender differences on the critical thinking abilities of high school students in Malang. The group of female students showed higher critical thinking skills than male students.

#### 4. CONCLUSION

Research conclusions in analyzing the form of affective assessment of critical reasoning abilities in terms of the gender of elementary school students, along with the indicators that make up the critical reasoning ability instrument for the 2021/2022 Academic Year. It can be concluded as follows: First, there are no significant differences in the form of affective assessment of critical reasoning abilities based on gender in the male and female groups, with indicators of critical reasoning abilities such as: a) seeking information; b) assess information; c) make conclusions; and d) make conclusions. Second, the results of the Independent t test showed that there were no significant differences in all indicators of affective assessment of critical reasoning abilities based on gender (male and female).

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