

ANALYSIS OF CRITICAL THINKING SKILLS AND LEARNING INDEPENDENCE OF ELEMENTARY SCHOOL STUDENTS

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Abstract: The purpose of this observation is to analyze how students' thinking skills are when viewed from the perspective of students' learning independence. This research was conducted in class 4 of SDN Penggung Utara. The research subjects were 38 students consisting of 12 male students and 26 female students. This observation used a qualitative research type. The instruments used in this study were a learning independence questionnaire, and a written test of conceptual understanding consisting of 7 descriptive questions and interviews with homeroom teachers. Data analysis used includes data presentation and drawing conclusions. The results of this study state that students with critical thinking skills of 81-100% are included in the very good category.

Keywords: Critical thinking, independent learning, mathematics

INTRODUCTION

Education is a strategic vehicle in developing individual potential to achieve the goal of building a whole human being (Muhammad Yusuf, 2021). Education includes the quantitative and objective aspects of the learning process. Thus, education refers to the learning process and the development of knowledge, skills, values, and attitudes through instruction, training, or research of learning systems (Abd Rahman, 2022). Learning can also be interpreted as the result of continuous interaction between development and life experience (Trianto, 2009). Therefore, learning includes two-way communication between educators and students to achieve the targets that have been set (Trianto, 2009).

The content standards in the National Education Regulation state that the ability to solve mathematical problems is one of the main objectives of this subject (Mustaqim, 2008). These abilities include problem understanding, model design, model completion, and interpretation of the solutions obtained. Effective learning must be able to develop problem-solving skills through relevant materials. Thus, students can be actively involved in using

conceptual thinking during the learning process (Tita Mulyani, 2020). Students' inability to solve problems can be minimized by practicing critical thinking skills.

The teaching and learning process in schools today tends to be teacher-centered, so it is less actively involved with students (Maharani, Sukestiyarno, & Waluya, 2017). Teachers should play the role of mediators and facilitators in developing students' thinking skills (Suparno, 1997). *Self-Regulated Learning* (SRL) is an approach to improve student cognition, motivation, and behavior during learning (Meiliana, 2019; Noer, 2014). Through SRL, students are expected to be more active and independent in following the learning process in the classroom. This has a positive impact on students' independence, which is the basis for the development of critical thinking skills.

Learning independence is the ability to be driven by self-awareness to achieve learning goals. This independence helps students recognize their own potential and encourages the development of critical thinking skills that have an impact on mathematical achievement (Brookfield in Ranti, 2017). Some terms are similar to learning independence, such as *self-regulated learning*, *self-regulated thinking*, and *self-directed learning* (Sumarmo, 2006). SRL encourages students to organize and manage their own learning, strengthening their analytical abilities and understanding of mathematical concepts. Independent learning and critical thinking are important elements in SRL-based mathematics learning.

Self-regulated learning includes the planned and continuous arrangement of students' thoughts, feelings, and actions to achieve goals (Fatimah, 2006). Students' critical thinking skills can be improved through the use of specific learning models. Strategies such as critical tasks of books and the use of stories can also be helpful (Zamroni & Mahfudz in Suryani, 2019). One effective model is SRL, which emphasizes student independence during the learning process. Learning independence also affects students' attitudes and perceptions, making learning more fun and meaningful.

Mathematics as a discipline has a unique character because of its abstract and hierarchical nature. Deductive reasoning is the main feature in mathematics learning, so every concept must be taught concretely first (Dienes, 2019). According to Piaget, elementary school-age children are at the concrete operational stage, so they better understand real objects (Muhsetyo, 2008). Therefore, mathematics learning needs to take advantage of real problems so that students can think critically. This emphasis on concrete approaches helps students develop a deep understanding of mathematical concepts.

Students' critical thinking skills can be improved through the application of certain relevant learning models. Models such as *self-regulated learning* allow students to manage their learning process independently (Cahyan & Kusaeri, 2016). This approach not only influences student engagement but also strengthens creative and critical thinking skills. In the context of mathematics, SRL is one of the effective methods to help students understand abstract concepts better (Fardah, 2012; Noer, 2011). An emphasis on learning that actively engages students is key to success.

This study aims to analyze students' critical thinking skills reviewed from the aspect of learning independence. Students' independence in learning mathematics is very closely related to the development of critical thinking. By utilizing *self-regulated learning* methods, students can manage their learning effectively. In addition, this approach encourages

students to understand mathematical concepts in depth through relevant learning experiences. The results of the research are expected to contribute to the development of effective mathematics learning methods at SD Penggung Utara Cirebon.

METHODS

In this observation, the examiner examined the relationship between learning independence and students' critical thinking ability using a quantitative approach. This research involved 4th grade students of SDN Penggung Utara totaling 38 students as the target of the research. Data collection is carried out through a questionnaire filling method that is systematically prepared. This questionnaire aims to measure the level of student learning independence in the learning process. In addition, data collection is also equipped with the measurement of critical thinking skills through analytical tests.

Students' critical thinking skills are measured using questions that ask them to analyze the problem and give the right reasons for the given answer. This test is designed so that students can show logical ability in answering problems. Observation has been carried out according to procedures by obtaining permission from the principal and homeroom teacher. Support from the school ensures that research can run smoothly and in accordance with applicable ethics. Thus, the data obtained is expected to provide a clear picture of the relationship between learning independence and students' critical thinking skills.

RESULT AND DISCUSSION

In this questionnaire, there are 7 questions with 5 different assessment aspects. The first problem measures the ability to *make inferences* related to the circumference of the rectangle. The second problem focuses on *assumptions* related to the area of a rectangle. Furthermore, questions number 3 and 4 test the ability to *deduct* in solving problems related to triangles. These questions are designed to see students' ability to analyze and solve mathematical problems.

In question number 5, the aspect measured is interpretation or the ability to solve problems related to square and rectangular areas. Meanwhile, questions number 6 and 7 assess the *ability to evaluate arguments*, namely the ability to determine problems related to the circumference of a rectangle. The questions in this questionnaire aim to measure students' critical thinking skills systematically. Each aspect of the assessment is adjusted to the mathematics material that the student has learned. Thus, this questionnaire can provide a comprehensive overview of students' critical thinking skills.

Table 1. Description of test questions

Kisi-kisi	Indikator	Nomor soal
Menyelesaikan masalah yang berkaitan dengan keliling persegi panjang	Inference	1
Menentukan luas persegi panjang	Assumption	2
Menyelesaikan masalah yang berkaitan dengan segitiga	Deduction	3 dan 4
Menentukan luas persegi dan persegi panjang	Interpretation	5
Menentukan keliling persegi panjang	Evaluation of arguments	6 dan 7

This questionnaire consists of 7 questions covering 5 aspects of assessment. The first problem measures the ability to *inference* (inference) related to the circumference of the rectangle. The second question tests *assumptions* related to the area of a rectangle. Meanwhile, questions number 3 and 4 focus on *deduction* to solve problems related to triangles. These questions are designed to see students' ability to think logically and systematically.

In question number 5, the aspect that is assessed is *interpretation*, which is related to solving problems about square and rectangular areas. Meanwhile, questions number 6 and 7 measure *the evaluation of arguments*, which is the ability to determine problems related to the circumference of the rectangle. Each question is arranged to test students' critical thinking skills in analyzing and solving mathematical problems. With a variety of assessment aspects, this questionnaire provides a comprehensive overview of students' thinking skills. The preparation of questions is adjusted to the material that has been taught so that it is relevant to the student's ability.

Table 2. Categories Critical thinking skills

Score	Category
81 - 100	Sangat baik
61 - 80	Baik
41 - 60	Cukup
0 - 40	Kurang

The assessment in the study was divided into four categories based on the score range. A score of 81-100 is categorized as "excellent," which indicates that the research is of very high quality and meets expectations. A score of 61-80 is included in the "good" category, meaning that the research is of adequate quality and has met the set standards. This assessment reflects positive results and shows the ability of the research to achieve the expected goals. Thus, these two categories represent good to excellent research quality.

Furthermore, a score of 41-60 is categorized as "adequate," which indicates that the research meets the minimum limits of quality and required standards. Although it meets the basic standards, the quality of research in this category can still be improved. Meanwhile, a score of 0-40 is categorized as "poor," meaning the study did not meet the expected standards. This shows that the research needs significant improvements in various aspects. This category is an important evaluation to improve the quality of future research.

Table 3. Demographic.

Gender	Number	Persen
Male	12	32%
Female	26	68%
Total	38	100%

Table 3. presenting data on the number of students who participated in the observation, with a total of 38 students. Of these, male students amounted to 12 students or about 32% of the total. Meanwhile, female students amounted to 26 students, which is equivalent to 68% of the total students. This data shows that the number of female students is more dominant

than male students. This proportion provides a clear picture of the distribution of sex in the observation participants.

The results of the questionnaire answers that have been filled out by all 4th grade students of SDN Penggung Utara show a varied distribution of data. Based on the results of the analysis, students' answers were grouped into four assessment categories, namely very good, good, adequate, and not good. This category is used to make it easier to understand the quality of the results obtained from student responses. The highest score achieved in the questionnaire was 92.1%, which indicates the excellent performance of some students. Meanwhile, these results reflect that most students are able to provide adequate answers according to expectations.

On the other hand, the lowest score obtained in the questionnaire was 31.6%, which was included in the poor category. This shows that there are some students who still need further attention and guidance to improve their understanding. The presentation of data in this category provides a clearer picture of the overall level of students' abilities. Thus, the results of this questionnaire can be used as a basis for designing more effective improvement steps. The following is an illustration in the form of a picture related to the results that have been obtained.

Figure 5. Frequency

No.	Nama Siswa	Indikator				
		Assumption	Evaluation of arguments	Deduction	Inference	Interpretation
Sangat baik	Annisa M	1	1	1	1	1
Baik	Kyky	1	1	0	0	1
Cukup	Zahara	0	1	1	0	0
Kurang	Nur Rizky	0	0	1	0	0

The frequency and percentage of data obtained during the analysis on grade 4 students of SDN Penggung Utara showed varying results. The category is excellently filled by 4 students, which covers 11% of the total students. These results reflect that a small percentage of students have demonstrated very satisfactory abilities. This category is an indicator that there are students with a very good understanding of the material being tested. Students in this category can be a reference to encourage other students to improve their performance.

Furthermore, the good category includes 18 students with a percentage of 47%. These results show that almost half of the total students have adequate understanding and are in accordance with the expected standards. Students in this category show good potential, but still have room for improvement. This data shows that most students are at a fairly satisfactory level. Advanced efforts are needed to elevate them to a higher category.

On the other hand, the category is enough to include 13 students with a percentage of 34%, showing that there are still a number of students who meet the minimum limit of learning quality. Meanwhile, the poor category includes 3 students with a percentage of 8%.

This data is an important concern because it shows that there are students who need more intensive assistance. Focusing on students in these last two categories can be a strategic step to improve the overall quality of learning. With this analysis, teachers can better understand the distribution of students' abilities and design more effective learning strategies.

CONCLUSION

Based on observations of the critical thinking ability and learning independence of elementary school students, several conclusions can be drawn. Critical thinking skills refer to an individual's ability to analyze, evaluate, and draw conclusions logically, especially in a mathematical context. In the observation of 4th grade students of SDN Penggung Utara, there were 4 students who showed high critical thinking skills. One of the students even got an almost perfect score, which was 92.1%. This shows that a small percentage of students have a very good understanding in applying critical thinking skills in mathematics.

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