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Profile of Critical Thinking Ability of Class VIII MTs Students in Hulu Sungai Utara Regency on Respiratory System Material

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ABSTRACT

This study aims to categorize the critical thinking skills of grade VIII junior high school students in Hulu Sungai Utara (HSU) Regency based on five critical thinking indicators according to Facione, namely interpretation, analysis, evaluation, inference, and explanation. The research method used was descriptive quantitative involving 78 students from three schools, namely MTsN 1, MTsN 2, and MTsN 5 HSU. The research instrument was in the form of multiple choice questions on respiratory system material based on critical thinking indicators that had been tested for validity and reliability. The results showed that students' critical thinking skills were generally in the very good category, with an average achievement value of 83.2%. Each critical thinking indicator showed variations in the level of achievement, but all were in the good to very good category. This categorization shows that students tend to excel more in certain indicators such as evaluation and explanation. Therefore, it is important for teachers to develop learning strategies that support the strengthening of critical thinking skills gradually and evenly across all indicators.

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1. INTRODUCTION

Critical thinking can be defined as an individual thinking process that can solve a problem or answer a question by selecting different options and choosing the most suitable and logical one (Alsaleh, 2020). According to Facione (2020) critical thinking is a form of self-control in making decisions that involve the process of interpretation, analysis, evaluation and inference as well as the delivery of ideas by referring to the evidence, concepts, methods, criteria or contextual considerations underlying the decision. Critical thinking skills enable students to objectively process, analyze and assess information and establish relevant relationships between information (Fajri et al., 2024).

Students who have critical thinking skills will not easily believe information, not easily offended and more consider the good and bad of something first before making a decision (Rahmawati et al., 2023). Learning in schools should be designed to support the development of these skills. This is not only important to prepare students for future challenges, but also to help them move from low-level thinking skills to higher-level thinking skills, and encourage the ability to learn and innovate (Arif billah, 2021).

Critical thinking skills are important to develop in students because they can strengthen reasoning skills, help solve problems, encourage creativity, improve communication skills, and improve the ability to manage time effectively (Okyranida, 2024). Critical thinking skills enable students to solve problems logically, reflectively, and effectively in decision making. The development of these skills can be done through a learning process that involves real problems in everyday life, as is often found in science learning (Faradisa, 2024).

Based on research conducted by Suryani (2022), it is known that the level of critical thinking skills of students at MTs Assalam Pontianak is still relatively low. This is due to the teaching methods applied in the classroom, which have not accustomed students to dealing with questions that test higher-order thinking skills,

resulting in students being less accustomed to developing their critical thinking skills. This is also supported by research conducted by Maharani et al (2024), which states that learning that applies methods limited to memorization and information retention will make students less able to think critically and systematically, resulting in their critical thinking skills remaining relatively low.

In addition to being a very important 21st century skill, critical thinking is also a key indicator in assessing student competence in various international assessments such as PISA and TIMSS. This indicates that critical thinking skills are not only needed in daily learning, but also a measure of the success of the education system globally. Therefore, education in Indonesia needs to respond to this challenge by instilling critical thinking skills from an early age, especially through science subjects that are loaded with the application of logic and analysis (Putri & Yuliati, 2023). Science learning needs to develop critical thinking skills because it can improve the ability to think critically, reason, understand students and solve an existing problem. The science learning process is expected to be able to encourage the development of critical thinking skills optimally. Students can be trained in critical thinking skills so that they are trained and skilled in using their thinking skills (Purwanto, 2019). To optimally develop students' critical thinking skills, an interactive classroom atmosphere is needed, where students are positioned as active thinkers, not just recipients of material, while the teacher acts as a mediator, facilitator, and motivator who assists the learning process, not just teaching. critical thinking skills can be developed through problem-based approaches, scientific inquiry, and contextual learning that connects material with real phenomena in the environment around students.

Research by Septianingrum & Mustaji (2022) shows that the problem-based learning (PBL) model can significantly improve the critical thinking skills of junior high school students on respiratory system material. This is because PBL encourages students to actively seek information, analyze data, and draw conclusions independently. Furthermore, the results of a study by Fadillah et al. (2024) stated that the application of project-based learning models in science materials has a positive impact on students' ability to evaluate and explain scientific concepts. The collaborative and investigative activities in the learning are able to stimulate the evaluation and explanation aspects of critical thinking. Such models need to be systematically integrated in the curriculum and lesson plans used by teachers.

However, the reality in the field shows that there are still many teachers who have not integrated the strengthening of critical thinking skills in learning consistently. This is due to various factors such as time constraints, the dominance of the lecture method, and the lack of professional training that supports the development of critical thinking pedagogics (Wahyuni & Hartono, 2023). This is supported by findings from PISA 2018, where Indonesian students ranked low in science literacy, reflecting challenges in interpreting data and reasoning scientifically. Furthermore, studies have found that students in MTs still show limited critical thinking ability, particularly in topics such as the respiratory system (Mulyana et al., 2022), due to factors such as time constraints, dominance of lecture-based teaching, and lack of professional training in critical thinking pedagogies.

Therefore, intervention is needed from schools and policy makers to increase teachers' capacity in designing and implementing learning based on critical thinking skills. This condition is also reinforced by Nurhasanah & Suwono's (2021) findings which show that most students only show low to medium level thinking skills if learning is not designed with a challenging cognitive approach. As a result, although students understand concepts theoretically, they have difficulty in applying these concepts to complex real situations. Therefore, it is very important to evaluate the quality of questions and learning methods regularly. This study aims to analyze students' critical thinking skills, the results of which are important as input for teachers in designing appropriate learning strategies to improve students' critical thinking skills, especially on the material of the respiratory system.

2. RESEARCH METHOD

The type of research used is descriptive quantitative research. Quantitative descriptive research is a type of research that utilizes quantitative methods with descriptive analysis techniques to understand and interpret the meaning of data scientifically (Alfatih, 2016: 2). According to Sugiyono (2012: 13) explains that descriptive research is research conducted to determine independent variables, either one or more (independent) variables without making comparisons or connecting with other variables. The approach in this study uses a quantitative approach because it uses numbers, starting from data collection, interpretation of the data and the appearance of the results. This approach is then related to the research variable, namely the critical thinking skills of students, especially in respiratory system material.

The research was conducted in three schools in Hulu Sungai Utara (HSU) Regency, namely MTsN 1 HSU, MTsN 2 HSU and MTsN 5 HSU with a research sample involving 78 students from three schools. The population in this study were all MTs schools in Hulu Sungai Utara district. The sampling technique in this study used random sampling technique, which is a way of taking samples from members of the population using random without paying attention to strata (levels) in the population members (Saefullah, 2024). The instrument used in this study consists of 10 multiple-choice questions aimed at assessing students' critical thinking skills,

with two questions aligned to each of the five critical thinking indicators. The instrument was validated by three experts using the Aiken's V (1985) index, which produced a validity coefficient of 1.00, indicating that all items are highly relevant and appropriate for measuring critical thinking skills. Furthermore, the instrument demonstrated good internal consistency, with a Cronbach's Alpha reliability coefficient of 0.82. These results confirm that the instrument is both valid and reliable for use in educational research contexts. The research instrument in the form of multiple choice questions is entered into google form then the data from google form is entered into microsoft excel to be analyzed.

The data in this study were analyzed using descriptive analysis. According to Sugiyono (2014: 21), descriptive analysis method is a type of statistics used to analyze data by describing or explaining the data that has been obtained as it is, without aiming to draw general conclusions or make generalizations. Meanwhile, Nazir (2003: 54) states that the descriptive method is a research approach used to study the state of a human group, object, situation, thought, or a type of event in the present. Data analysis was carried out in 2 stages, namely 1) Analysis of test result data, and 2) Descriptive analysis to explain how the level of critical thinking skills of grade 8 junior high school / MTs students in Hulu Sungai Utara Regency on the material of the respiratory system.

Data analysis of the Critical Thinking Skills (CTS) test results was then converted based on the categories according to Rahmawati et al (2019) in table 1, namely the categories of very good, good, sufficient, less and very less.

Tabel 1. Categories of Critical Thinking Ability

Achievement Rate (%)	Category
81 - 100	Very good
61 - 80	Good
41 - 60	Simply
21 - 40	Less
0 - 20	Very Less

Rahmawati et al (2019)

3. RESULT AND DISCUSSION

The material used in this study is the respiratory system that has been studied in the odd semester. This is done because this study aims to analyze students' critical thinking skills on respiratory system material based on its category. Before categorizing critical thinking skills based on the indicators, first a description of students' critical thinking skills based on the overall final score is presented. The scores obtained by students vary. The highest score obtained by students reached a value of 100, while the lowest score was 20. Based on the results of research and data analysis of students' critical thinking ability test results, the results of students' critical thinking ability have an average value of 83.2% and are included in the very good category presented in table 2.

From the perspective of Bloom's Revised Taxonomy (Anderson & Krathwohl, 2001), this achievement aligns with the upper levels of cognitive processes, particularly analyzing, evaluating, and creating. Critical thinking, by nature, demands students to not only remember and understand concepts but also to make inferences, clarify assumptions, and evaluate arguments. The high average score suggests that learning activities may have supported higher-order thinking skills, possibly through inquiry-based strategies or structured question prompts aligned with HOTS (Higher-Order Thinking Skills).

When viewed through Piaget's cognitive development theory, most students at the MTs (Madrasah Tsanawiyah) level fall into the formal operational stage, typically beginning around age 12. In this stage, students begin to think abstractly, reason logically, and solve hypothetical problems all of which are crucial for critical thinking. This developmental readiness may explain why many students were able to perform well in tasks requiring inference, justification, and complex reasoning.

The categorization of critical thinking performance based on indicators revealed varied levels of achievement across the different dimensions. According to Facione's (1990) framework, critical thinking comprises several core skills: interpretation, analysis, evaluation, inference, explanation, and self-regulation. Differences in student performance across these indicators may reflect the hierarchical and interdependent nature of these skills. For example, students might excel in "interpretation" and "explanation" because these are more concrete and closely tied to recall and comprehension, while they may struggle more with "evaluation" and "self-regulation," which require metacognitive awareness and the ability to question assumptions competencies that are often underdeveloped without targeted instruction.

The variation in scores also suggests the need to deliberately design learning experiences that integrate all dimensions of critical thinking rather than emphasizing only a few. Research by Ennis (1993) and Paul &

Elder (2008) supports the idea that critical thinking is teachable and must be embedded explicitly within content learning such as in science education to be effectively cultivated.

Tabel 2. Results of Achievement of Students' Critical Thinking Ability

School	Achievement Rate (%)	Category
MTsN 1 HSU	69,4	Good
MTsN 2 HSU	96,8	Very good
MTsN 5 HSU	83,4	Very good
Average	83,2	Very good

Based on the data in table 2, it can be seen that students of MTsN 2 HSU and MTsN 5 HSU are in the very good category. While MTsN 1 students are in the good category. Other research also shows that the level of critical thinking skills of junior high school students, especially in science learning, has increased with a very good category for 3 indicators (focusing questions, inducing and considering the results of induction and determining actions) and 1 indicator in the good category (analyzing arguments) (Muflihah & Budiastuti, 2024). Students' critical thinking skills tend to focus on certain indicators, so the development of critical thinking skills carried out in stages based on each indicator will be more effective and directed. Therefore, this study will also present the results of the analysis of critical thinking skills on each indicator according to their respective categories.

Interpretation Ability

The first indicator of critical thinking ability is interpretation ability. Interpretation is the ability to understand and identify the meaning or purpose of various experiences, situations, data, events, decisions, habits, beliefs, rules, procedures, and criteria (Nuroniyah et al, 2022). In this study there are two indicators of the questions used, namely 1) presented the phases that occur in abdominal breathing, students can interpret the mechanism of abdominal breathing correctly and 2) presented the event of chest breathing, students can interpret the characteristics of chest breathing during inspiration correctly.

Based on Figure 1, students' interpretation skills in the three schools fall into the good and very good categories. This data shows that students' ability to interpret abdominal breathing and inspiratory breathing material is good. Students are considered to be able to understand the meaning of problems related to the material presented in the problem (Azzahra et al., 2023).

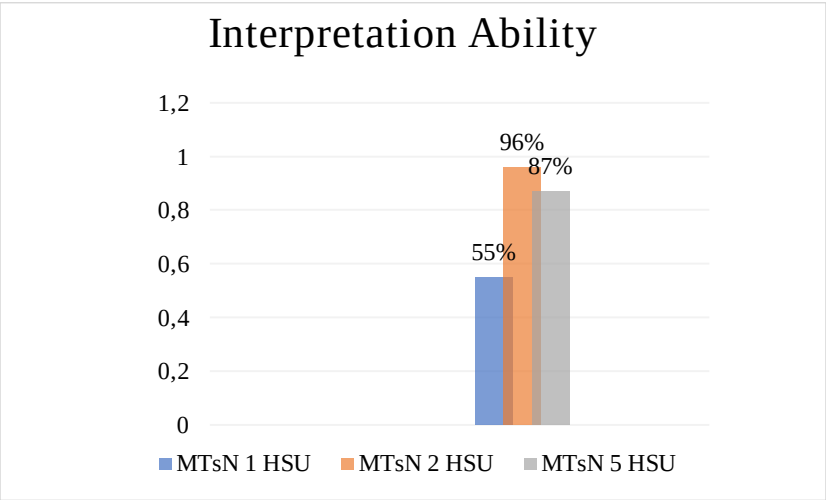

Figure 1. Categorization of Interpretation Ability

Analysis Skills

The second critical thinking ability indicator is analysis ability. In the ability to analyze students are asked to identify inferential relationships that are both implicit and explicit, between statements, concepts, descriptions or other forms of representation used to express beliefs, judgments, reasons, information or opinions (Nawastu et

al., 2022). The indicator of the question in this ability is that students can correctly analyze the factors that affect breathing frequency.

Based on Figure 2, the ability to analyze students falls into the good and very good categories. This shows that students' ability to analyze questions that contain material on factors that affect breathing frequency is good.

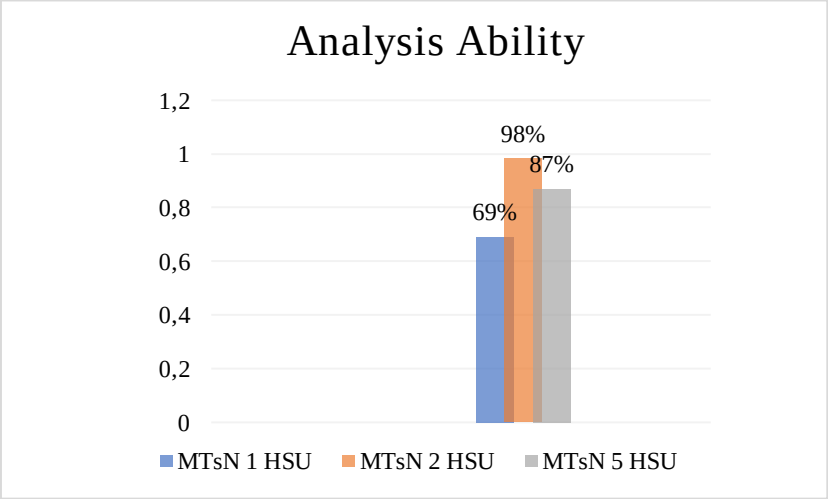

Figure 2. Categorization of Analysis Ability

Evaluation Ability

The third indicator of critical thinking ability is evaluation ability. Evaluation is the skill to be able to reach the integrity of the proposition, as well as the ability to reason in reaching the relationship between opinions, descriptions, problems with theory (Suriati et al., 2021). In this study, there are two indicators of the questions used, namely 1) presented the symptoms of respiratory system diseases, students can evaluate the statements on the respiratory system correctly and 2) presented the dangers of smoking, students can evaluate the preventive efforts made related to the dangers of smoking correctly.

Based on Figure 3, students' ability to evaluate falls into the good and very good categories. This data shows that students have good evaluation skills, especially on the problem of diseases of the respiratory system and their prevention efforts.

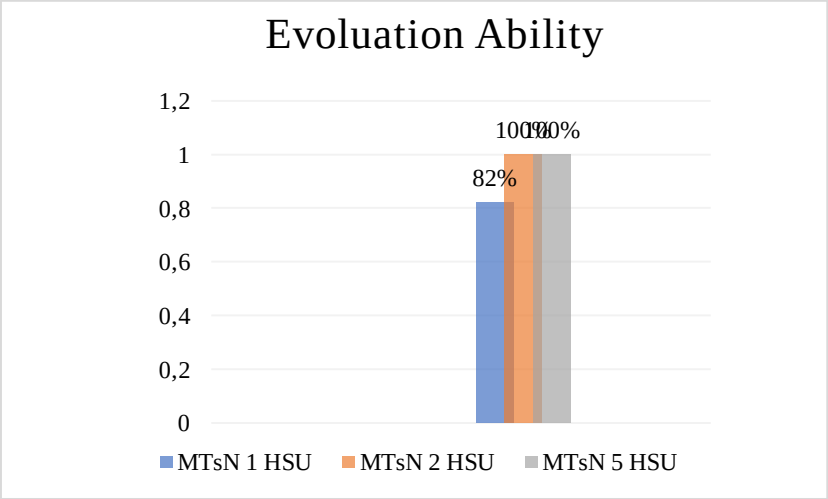

Figure 3. Categorization of Evaluation Ability

Conclusion Ability

The fourth critical thinking ability indicator is conclusion ability. In this indicator students can identify and obtain concepts in drawing a conclusion (Murtalib, 2022). There are two indicators of problems in this ability,

namely 1) presented the characteristics of the volume of breathing air, students can conclude the volume of breathing based on the characteristics given correctly and 2) presented a picture of experimental activities related to breathing volume, students can determine the volume measured in experimental activities correctly.

Based on Figure 4, it can be seen that students' ability to conclude is in the good and very good categories. This data shows that students have the ability to think critically to conclude problems related to breathing volume.

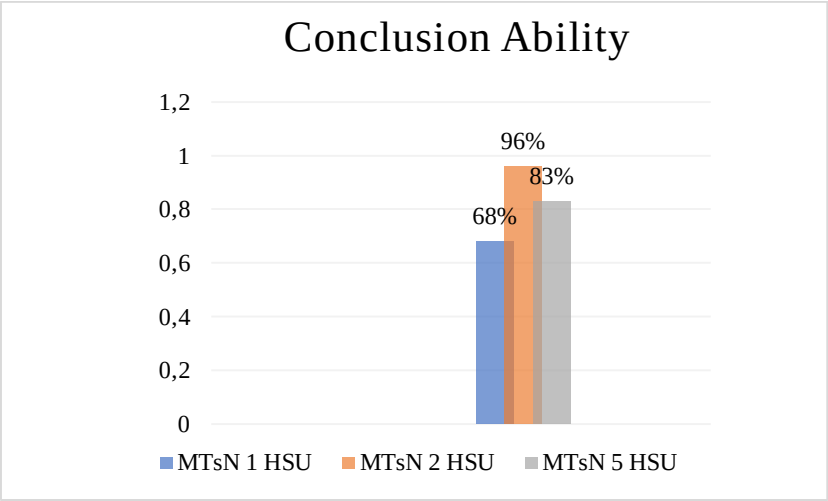

Figure 4. Categorization of Conclusion Ability

Explanation Ability

The fifth indicator of critical thinking ability is explanation ability. In this indicator, students can present one's reasoning in the form of strong arguments (Ningrum & Ratman, 2021). There are two indicators of questions in this ability, namely: 1) presented several statements related to respiratory organs and their functions, students can explain the respiratory organs and their functions correctly and 2) presented a picture of the structure of the respiratory system, students can explain the function of the organs designated by the picture correctly.

Based on Figure 5, it can be seen that the level of students' conclusion ability is in the good and very good categories. This data shows that students' critical thinking skills to explain the function of the respiratory system organs are good.

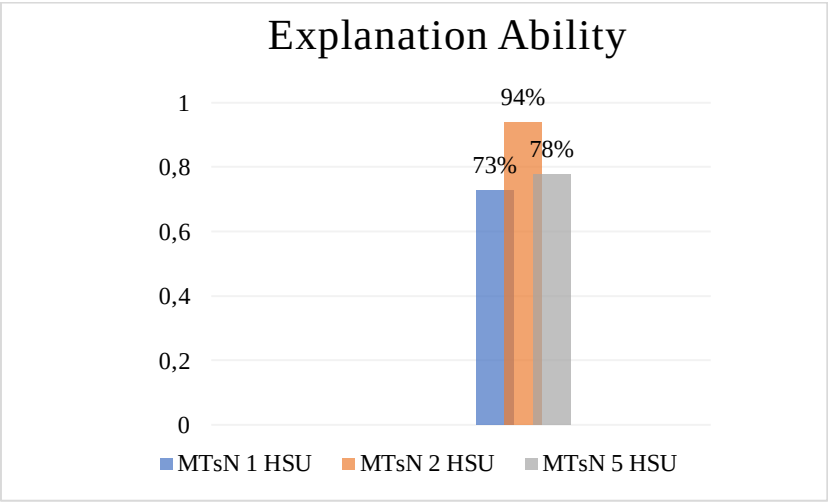

Figure 5. Categorization of Explanation Ability

The results showed that the critical thinking skills of seventh grade students in Hulu Sungai Utara District on the material of the respiratory system were in the very good category in general. From the results of the analysis obtained, it is known that the learning approach used in the three schools is sufficient to support the

development of critical thinking skills, especially in terms of evaluation and explanation. Based on the results of student performance and the overall context of the study, it can be inferred that the learning approach used in the three schools may be adequate in supporting the development of certain aspects of critical thinking skills, especially evaluation and explanation. However, this interpretation is made by the researcher and is not directly supported by observational or interview data.This is in line with research conducted by Haryati & Arifin (2023) which shows that providing stimulus in the form of contextual videos and simple experiments can improve students' evaluative and explanatory abilities in science materials. This approach helps students interpret the material as something close to their lives.

When viewed based on each indicator, all indicators are in the good to very good category. evaluation and explanation indicators are the two aspects with the highest achievement which shows that students are able to assess the truth of an argument and explain a concept or process well. The success in this indicator can be due to the learning approach that allows students to evaluate real phenomena such as the dangers of smoking and respiratory system diseases, as well as activities that involve visual representations (pictures of respiratory organs) that support students' understanding and explanation.

On the other hand, the interpretation and conclusion indicators, although still in the good and very good categories, still have room for strengthening. Interpretation requires students to understand the meaning of information or events, which requires critical reading skills and understanding of context. Meanwhile, inference ability requires students to do inductive or deductive reasoning from the information provided, which may not be accustomed to being done explicitly in daily learning. This is in line with the results of research conducted by Murtalib (2022) who emphasized the importance of systematic reasoning training in the learning process. Variation between schools is also an important highlight. MTsN 2 HSU showed the highest achievement (96.8%) compared to the other two schools. This may be influenced by internal factors such as the quality of teaching, the availability of learning resources, or the learning culture in the school. This fact indicates the need for a consistent learning approach between schools to ensure equal distribution of critical thinking skills across educational units.

The differences in achievement between schools also highlight the importance of systemic support in the development of critical thinking skills. High-achieving schools generally demonstrate good learning management, a conducive learning environment, and the availability of resources such as interactive learning media (Wulandari & Supriadi, 2022). Therefore, developing teacher professionalism and providing infrastructure are important factors to ensure equitable education quality.

In general, this research shows that a science learning approach that is linked to real-life contexts is effective in improving students' critical thinking skills. Teachers have a central role in facilitating these skills by encouraging students to observe, reason, evaluate and explain scientific phenomena. Problem-based learning or scientific inquiry is the recommended strategy because it is in line with the characteristics of developing higher order thinking skills (HOTS). Thus, it is not enough for science learning to convey facts and concepts, but it must also stimulate mental activities that challenge students to think critically. To achieve this, teachers need to develop assessments and learning activities that are in line with critical thinking indicators, and create a learning environment that facilitates discussion, exploration and reflection.

4. CONCLUSION

This study aims to categorize the critical thinking skills of students in grade VIII SMP/MTs in Hulu Sungai Utara Regency. The results of the analysis showed that overall, students' critical thinking skills were in the very good category, with an average achievement level of 83.2%. Based on the categorization results, most students showed high ability in almost all indicators, although there was a tendency for dominance in certain indicators.

The evaluation and explanation indicators show a high level of mastery, while the interpretation and conclusion indicators are in a category that can still be improved more evenly. These findings indicate the need for learning strategies that develop critical thinking skills thoroughly and gradually in each indicator. Teachers need to design contextual and problem-based learning, by strengthening the role of students as active subjects in thinking, analyzing, and concluding information logically and systematically. The weakness of this study is that it only analyzes students' critical thinking skills in three schools in Hulu Sungai Utara district, and only tests respiratory system material, so it does not cover all science material.

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