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Analysis of Activeness and Critical Thinking of Students in MA Al-Djufri Blumbungan

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Abstract: This study aims to analyze the activeness and critical thinking skills of students in Class XII MA Al-Djufri Blumbungan. A quantitative research approach was employed, utilizing questionnaires as the primary data collection method. The study focused on biology, with a sample of 20 students. Data on student engagement were collected through classroom observations, focusing on participation in discussions, responses to teacher questions, and peer interactions. The findings indicate that student engagement is generally classified as medium to high. However, the critical thinking skills of students are categorized as low, with less than 60% of students demonstrating critical thinking abilities. The results highlight the need for enhanced pedagogical strategies to foster both engagement and critical thinking in the classroom.

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Introduction

Education plays a pivotal role in character building and the development of moral values, which ultimately shape individuals into responsible citizens. Beyond merely transferring knowledge, education serves as a central mechanism for transforming attitudes and behaviors. It is a complex and continuous process that takes place across various environments, including family, community, and, most prominently, schools. One of the key objectives of education is to foster individual potential—intellectually, emotionally, and spiritually. Through education, moral values such as responsibility, mutual respect, and honesty can be instilled and serve as guiding principles in everyday life.

Furthermore, education aims to equip students with critical thinking skills, which are essential for enhancing students' active participation in the learning process (Puspita et al., 2017). Student engagement during learning activities is a key indicator of educational success. According to Novitasari and Wardhani (2018), student engagement can be measured through various indicators, such as participation in discussions, involvement in group tasks, and the ability to ask questions or provide responses during lessons. Teachers play a crucial role in fostering an interactive learning environment that encourages student engagement through the use of diverse and innovative teaching methods. As a result, students not only gain a conceptual understanding of the material but are also able to apply this knowledge in real-world contexts through activities that require critical thinking.

Formative and summative assessments are two important approaches for measuring student engagement in learning. Formative assessments are conducted throughout the learning process and are designed to provide constructive feedback to students, helping them improve their understanding of the material (Damayanti et al., 2021). These assessments also involve observing students' participation in discussions and other learning activities. Conversely, summative assessments are administered at the end of a learning period to evaluate the overall learning outcomes, including an analysis of students' assignments or final exams. Critical thinking, as defined by Nurlaeli et al. (2018), refers to an individual's ability to evaluate and analyze information in-depth, allowing for the exploration of a situation, phenomenon, or problem. This skill is essential as it helps students form hypotheses and make informed decisions based on available evidence. Consistent with previous research, as highlighted by Chukwuyenum (2013), critical thinking skills must be intensively developed during the learning process to ensure that students actively participate and become more reflective in their comprehension of the material.

Previous studies have also emphasized the importance of enhancing both students' critical thinking skills and their engagement in learning to improve the overall quality of education. Duron et al. (2006) assert that incorporating critical thinking skills into the learning process not only benefits students academically but also creates a more meaningful and rewarding learning experience for both students and teachers. According to Rahma et al. (2017), critical thinking skills, coupled with active student engagement, enable learners to address various problems with deeper interpretation, facilitating better responses to challenges they encounter. Building on these insights from the literature, this study aims to analyze the level of student engagement and critical thinking skills of twelfth-grade students at MA Al-Djufri. The goal is to gain a clearer understanding of how student engagement influences the development of critical thinking skills and how both can be enhanced in the context of secondary education.

Research Method

This research was conducted at MA Al-Djufri Blumbungan from October to November 2023. The study employed a quantitative research method, with data collection carried out through observation and questionnaires to assess students' engagement and critical thinking skills in biology classes. The research sample consisted of 20 randomly selected twelfth-grade students.

Data Collection

Student engagement data were obtained through observations conducted during biology lessons. These observations assessed students' participation in class discussions, responses to teacher questions, and interactions with their peers. Additionally, a questionnaire was administered to evaluate students' levels of engagement and attitudes toward the learning process. The questionnaire included questions about how frequently students participated in discussions, their confidence in expressing opinions, and their involvement in learning activities. A problem-solving test was administered to measure critical thinking skills. The test assessed five indicators of critical thinking: fluency, flexibility, originality, elaboration, and evaluation. Each question was designed to measure one or more of these critical thinking dimensions.

Data Analysis

Data from the questionnaires and critical thinking tests were analyzed descriptively using simple statistical methods. The results were categorized into high, medium, or low levels of student

engagement and critical thinking. The engagement scores were calculated based on the frequency of students' participation in learning activities, while critical thinking skills were assessed based on test results that measured the five key dimensions. This analysis provides an overview of the level of engagement and critical thinking skills of students at MA Al-Djufri in the context of biology learning.

Result and Discussion

This study aimed to analyze the activeness and critical thinking abilities of class XII MA Al-Djufri students in biology learning. Based on observations and questionnaires given to 20 students, the findings are as follows:

Student Perception of Biology Materials

Student Perception of Biology Materials is presented in Table 1.

Table 1. Student Perception of Biology Materials

Student Perception	Percentage (%)
Materials are too abundant and complex	52.00
Many difficult terms	42.30
Materials are hard to understand and imagine	16.55

More than half of the students expressed that the biology materials taught are too abundant and complex. This indicates that the large amount of material that must be learned in a limited time is one of the main obstacles for students. Students may have difficulty digesting large amounts of information, especially if the material is delivered without the aid of effective teaching methods, such as discussion-based or active learning methods. The percentage of students who feel that there are many difficult terms in biology materials is also quite high at 42.30%. This indicates that students face difficulties understanding the technical and scientific terms used in biology. The inability to understand these terms may affect their comprehension of more complex concepts in the subject matter. A smaller portion of students (16.55%) stated that biology materials are difficult to understand and visualize. This is likely due to the abstract nature of some biology concepts that require in-depth understanding or visualization. Topics such as cell structure, molecular processes, or life cycles are often challenging to visualize without the help of visual aids like diagrams, models, or interactive simulations.

Student Activeness

Based on the observations, student activeness was divided into high and moderate categories. The following table shows the distribution of student activeness:

Table 2. Student Activeness Level

Number of Students	Achievement (%)	Category
8	78-100	High
12	55-77	Moderate

A total of 8 students fell into the high category, with scores ranging from 78-100%, while 12 students were categorized as moderate, with scores between 55-77%. These results indicate that although most students are quite active, some still need encouragement to increase their participation in classroom activities. Student engagement in learning is a crucial indicator that determines the effectiveness of the teaching and learning process. Research by Finn & Zimmer (2012) emphasizes that students who are more active in learning tend to achieve better academic outcomes, as active engagement allows them to connect more deeply with the subject matter. Such engagement also aids in the development of social and communication skills, which further supports critical and analytical thinking abilities.

High student participation in class discussions also reflects the effectiveness of the teaching methods used. As noted by Prince (2004), active learning approaches, such as discussions and group work, can enhance student engagement and foster motivation for independent learning. This finding supports the conclusion that employing methods that encourage active student participation, such as Problem-Based Learning (PBL), can accelerate cognitive development. However, the moderate participation level of most students reveals challenges in motivating all students equally. Studies like that by Fredricks et al. (2004) identify that internal factors, such as self-motivation, and external factors, such as the quality of teacher-student interaction, can influence student engagement in learning. Therefore, teachers need to be mindful of individual differences and employ a broader range of strategies to stimulate more balanced student participation.

Critical Thinking

The results of the critical thinking skills test show that students' critical thinking abilities are generally low, with fewer than 60% demonstrating critical thinking skills. The test, which measured five dimensions of critical thinking, revealed that students struggled with most of the indicators.

Table 3. Levels of Critical Thinking Skills

Critical Thinking Dimension	Percentage (%)
Fluency	56
Flexibility	42
Originality	37
Elaboration	28
Evaluation	21

The data in Table 3 shows students' critical thinking skill levels based on five indicators: fluency, flexibility, originality, elaboration, and evaluation. The percentage obtained for each indicator provides an overview of the extent to which students can apply critical thinking skills in the learning context. In this context, critical thinking skills are essential competencies that need to be developed within educational environments to prepare students for the challenges of modern life (Facione, 2011).

The fluency indicator scored the highest at 56%, indicating that most students can generate multiple ideas in response to a problem. Fluency in thinking refers to the student's ability to express their ideas quickly and fluidly in various situations. This ability is linked to flexibility in thinking and creativity, demonstrating that students can formulate various alternative answers or solutions without significant difficulty. Some studies have shown that a learning environment that supports

free and spontaneous expression of ideas, such as project-based learning approaches, can enhance students' fluency in thinking (Bell, 2010). The flexibility indicator scored 42%, suggesting that students' ability to think flexibly or view a problem from multiple perspectives is not as optimal as fluency. Flexibility in thinking is an important skill in problem-solving that involves adapting to changing situations or new information (Barak & Shakhman, 2008). Although flexibility is still at a moderate level, there is significant potential for development. The lower level of flexibility compared to fluency indicates the need for teaching strategies that stimulate alternative perspectives, such as problem-based learning, which involves students in real-life situations where they must consider various solutions from different viewpoints (Hmelo-Silver, 2004).

The originality indicator recorded a percentage of 37%, which reflects students' ability to generate new and unique ideas. Originality reflects the extent to which students can produce ideas that are not widely considered by others. The low level of originality may be due to a lack of creative stimulation in the learning process. Meanwhile, the elaboration indicator scored 28%, indicating that students' ability to develop ideas in depth remains quite low. Elaboration relates to students' ability to detail or expand ideas and create the components of complex thoughts. Research by Swartz et al. (2010) shows that students who receive practice in analyzing information in depth and using learning approaches focused on critical thinking development show improvement in elaboration skills. Therefore, it is important to develop teaching strategies that require students to conduct deeper analysis, such as through analytical essay assignments or independent research projects.

The evaluation indicator received the lowest percentage at 21%, indicating that students' ability to assess and evaluate an idea, argument, or solution is very limited. Evaluation is a key component of critical thinking that involves the ability to evaluate arguments or conclusions based on existing evidence or logic (Facione, 2011). The low results on this indicator suggest that students are undertrained in making critical assessments. According to a study by Ennis (2015), evaluation skills can be improved through the application of self-assessment and peer assessment strategies regularly conducted in class. Students can develop better evaluation skills by providing constructive feedback and opportunities to assess their own or classmates' work. Overall, this data indicates that students' critical thinking skills still need improvement, particularly in the aspects of originality, elaboration, and evaluation. According to Lai (2011), critical thinking skills involve the students' ability to integrate knowledge, analyze information, and make reasoned judgments. In the current educational context, these skills are essential for preparing students to face complex future challenges. Therefore, an emphasis on inquiry-based and problem-solving learning will greatly help in improving the lower critical thinking indicators, such as originality and evaluation (Hmelo-Silver, 2004; Swartz et al., 2010).

To strengthen these findings, critical thinking skills were also measured separately for male and female students to identify potential gender influences. The critical thinking skills of each gender are displayed in Table 4.

Table 4. Critical Thinking Skills

Gender	Number of Students	Critical Thinking Percentage (%)
Male	12	60
Female	8	40

The student's critical thinking abilities in this study are still relatively low, with 60% of male students demonstrating higher critical thinking skills compared to 40% of female students. This

finding underscores the need for improved strategies to develop critical thinking skills among students. This is consistent with Abrami et al. (2015), who emphasize that instruction not specifically structured to train critical thinking abilities often fails to enhance these skills effectively. Furthermore, Halpern (2014) argues that critical thinking should be fostered through activities involving real-world problem-solving and open discussion. This suggests that students at MA Al-Djufri may lack exposure to learning situations that demand in-depth evaluation, analysis, and interpretation. To improve critical thinking skills, an approach that focuses on developing evaluative and reflective abilities is needed, such as the Socratic questioning method or project-based learning (PBL).Additionally, the gender differences in critical thinking levels may be linked to social and cultural factors that shape how male and female students respond to cognitive challenges. Research by Tirri and Nokelainen (2012) shows that gender bias in education often influences students' expectations and learning experiences, which can impact the development of critical thinking skills. Therefore, educators need to reduce this bias by providing equal opportunities in all aspects of learning.

The activeness of students in the biology learning process at MA Al-Djufri still needs improvement. While most students are considered quite active, some indicators, such as participation in discussions and the courage to ask questions, require further enhancement. Interactive and problem-based learning methods (PBL) can help students become more actively engaged in learning, thus not only memorizing material but also involving them in the process of analyzing and solving problems. Meanwhile, the critical thinking ability of the students is generally at a low level, especially in the areas of evaluation and elaboration. This suggests that the current learning process has not sufficiently developed the students' critical thinking skills. Twenty-first-century learning demands that students are able to think analytically and objectively. Implementing learning methods that emphasize higher-order thinking skills is crucial to preparing students to face future challenges.

Conclusion

Based on the results of this study, it can be concluded that (1) the activeness of Class XII students at MA Al-Djufri falls into high and moderate categories, with 40% of students demonstrating high levels of activeness, while 60% are at a moderate level, and (2) students' critical thinking skills remain low, with fewer than 60% of students demonstrating critical thinking abilities across the five measured indicators. Overall, this study shows that while student engagement in class is relatively good, critical thinking skills need more attention. The application of problem-based learning methods, structured discussions, and the use of more contextual media can be effective strategies to increase student engagement and develop their critical thinking skills.

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