Profile of Students' Critical Thinking Ability with Citatah Karst Damage as a Learning Source

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Abstract: Previous research found that critical thinking skills of students need to be trained more intensively using authentic problems in daily life. Critical thinking can be developed through problem-based learning as a pedagogical approach in an aligned learning and teaching context. This research aims to obtain the profile of students' critical thinking skills through authentic problems, the damage to the Citatah karst environment. Learning activities are carried out using a Problem Based Learning (PBL) model. The sample used was 25 people of 7th grade students of SMP Krida Utama Padalarang. This type of research is descriptive qualitative research. The indicators of critical thinking skills measured in this study are: formulating problems, asking HOTS questions, arguing, observing and choosing sources of information, determining actions and communicating. Based on data analysis and discussion, it can be concluded that on all indicators of critical thinking skills, most students are in the moderate category or need assist to stimulate their critical thinking skills.

Keywords: Critical thinking, Problem based learning, Karst Citatah

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Introduction

Critical Thinking Ability

In an effort to prepare future generations to navigate their lives with resilience, education plays a crucial role in shaping students' character and mindset. The development of 21st-century skills is essential in the learning process. Trilling and Fadel (2009) identified three key aspects of 21st-century skills: critical thinking and problem-solving (expert thinking), communication and collaboration (complex communicating), and creativity and innovation (applied imagination and invention).

These three skills redefine the traditional perspective on future work skill demands. The increasing need for individuals who can think critically, solve problems, communicate effectively, collaborate efficiently, and demonstrate creativity and continuous innovation presents a significant challenge for the current education

system. Trilling and Fadel (2009) assert that critical thinking skills are closely intertwined with problem-solving skills. By cultivating critical thinking and problem-solving abilities, students can reason effectively, employ systemic thinking, make informed judgments and decisions, and tackle complex problems. Problem-based learning, which utilizes real-world facts and authentic issues relevant to students, can effectively foster critical thinking and problem-solving skills within the educational process.

Previous research highlights the importance of intensively training students' critical thinking skills using authentic problems from daily life. Consequently, this study aims to assess students' profile of critical thinking abilities by examining the impacts of karst damage on the Citatah region as a learning resource.

Critical thinking skills are crucial for effective problem-solving, decision-making, and reasoning (Ennis, 1985). Authentic problems, which are real-world, relevant, and meaningful challenges, play a vital role in assessing and developing these skills (Dori & Belcher, 2005). By engaging students in authentic problems, educators provide context and relevance to the learning process, promoting active learning and higher levels of student motivation (Lombardi, 2007). Authentic assessments, such as performance tasks, case studies, and simulations, accurately capture the depth of critical thinking skills and students' abilities to transfer knowledge to practical situations (Pellegrino et al., 2001). Moreover, authentic problems encourage collaboration, communication, and teamwork, fostering students' interpersonal skills (Prince & Felder, 2007). The integration of authentic problems across disciplines prepares students for real-world challenges and workplace requirements (Perkins, 1992). Teachers play a vital role in designing and facilitating authentic problem-based learning experiences, providing students with feedback and opportunities for reflection to enhance their critical thinking development (Hmelo-Silver et al., 2007). Ongoing reflection and evaluation of the effectiveness of using authentic problems in teaching and assessment practices are essential for continuous improvement (Gijbels et al., 2005).

Citatah Karst Damage as Learning source

The West Bandung Regency, particularly Padalarang, is home to a vast karst area encompassing at least eleven karst hills. Unfortunately, most of these karst hills have been severely damaged due to limestone and marble mining activities. Large-scale mining operations by certain companies have resulted in escalating ecological degradation.

The Citatah karst complex holds significant importance as a learning resource and is closely linked to the development of critical thinking skills. As a school located in Padalarang, where the karst area is abundant, it is essential for students to explore and understand the natural resources in their. By incorporating the Citatah karst complex into science learning activities, students have the opportunity to engage in real-world problem-solving and critical thinking processes.

As a school located in Padalarang, it is crucial for students to identify the natural resources in their area and

comprehend the associated risks. To address this, SMP Krida Utama Padalarang implements a regular program that involves visits to the Citatah karst complex as part of science education. This program aims to enhance students' critical thinking skills, particularly regarding contextual issues in their surroundings. Normally, students would visit the Citatah karst complex in person; however, due to the pandemic, a combination of online and limited face-to-face learning is currently implemented. The problem-based learning (PBL) model is utilized, with contextual topics centered around the karst citatah complex. During online learning, activities are conducted virtually through the use of pictures, articles, and videos. Additionally, when limited face-to-face learning is possible, students engage in group presentations to explore alternative solutions. This topic aligns with the Basic Competencies of environmental pollution and the interaction of living things for grade 7, as outlined in the Indonesian science national curriculum.

To reiterate, the focus of this research is to assess students' profile of critical thinking abilities in relation to the impact of karst damage on the Citatah region as a learning resource. The critical thinking aspects investigated in this study include problem formulation, posing high-order thinking questions, argumentation, observation, source selection, decision-making, and communication.

Method

This research adopts a descriptive study design with a qualitative approach. Qualitative research involves gathering descriptive data, whether through oral or written sources, focusing on the treatment given or observed phenomena as the research focus (Bogdan & Taylor, 1975 as cited in Lexy J, 2007). The population and sample for this study were purposively selected. The research sample consists of 25 students from grade 7 at SMP Krida Utama Padalarang. Data collection methods included observation, interviews, and questionnaires. The observation data were then categorized, analyzed, and compared based on specific criteria. These criteria were selected purposively, taking into account their relevance and the researcher's ability to observe them at the time. The criteria used in this study were derived from Ennis (1985), as follow.

Table 1. Critical Thinking Criteria

Aspects of critical thinking	Criteria		
	high	Moderate	poor
Formulate problems	Students are able to formulate problems from shows/ data/ phenomena that are presented correctly	Students are able to formulate problems from shows/ data/ phenomena that are presented correctly with assistance	Students are not able to formulate problems from shows/ data/ phenomenapresented Asking HOTS questions

Asking HOTS questions	Students asking HOTS questions	Students asking questions	Students don't ask questions
Finding and selecting learning sources	Students are able to find sources of relevant information that are correct and credible	Students are able to find sources of relevant information that are not yet Credible	Students are not able to findsources of relevant information
Arguing	Students are able to argue with the right reasons	Students are able to argue with inaccurate reasons	Students are not able to argue
Determining Actions and Communicating	Students are able to determine the right actions and communicate them well	Students are able to determine the right actions but do not communicate them properly	Students are not able to determine the right actions and communicate them properly

Ennis,1985

Overall, this research aims to explore the critical thinking skills of the selected sample of grade 7 students by analyzing and interpreting the collected data in relation to the established criteria. By employing a qualitative approach and purposive sampling, the study seeks to gain insights into how these students demonstrate critical thinking abilities in the context of the Citatah karst complex. Through careful analysis and interpretation of the data, the researcher aims to provide valuable information about the students' critical thinking skills and their application in addressing authentic problems related to the karst complex.

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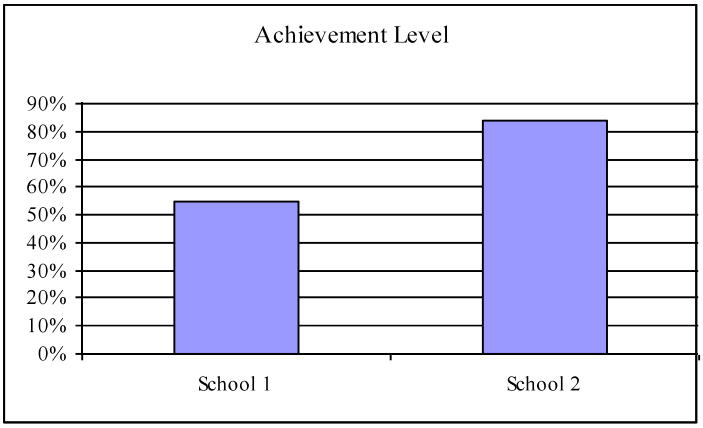

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Discussion

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Conclusion

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