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The relationship between creativity and the ability to solve HOTS science problems

Ardilla Dinova[1], Dea Mustika[2]
[1,2] Universitas Islam Riau, Kota Pekanbaru, Riau
ardilladinova@student.uir.ac.id[1], deamustika@edu.uir.ac.id[2]

ABSTRACT

The ability to solve Higher Order Thinking Skills (HOTS) questions in elementary science remains a challenge, as many students struggle with tasks requiring higher-level reasoning. This issue is critical because mastering HOTS is a key demand of the 21st-century curriculum, which emphasizes analytical, critical, and creative skills as essential competencies. Creativity is assumed to be one of the factors influencing this ability. This study aimed to investigate the relationship between creativity and the ability to solve HOTS science questions among fifth-grade students at SD Negeri 003 Tambusai. A quantitative method with a correlational approach was employed, involving a total sample of 79 students selected through a total sampling method. Data were collected using a creativity questionnaire and a HOTS-based science test. The analysis included normality testing, linearity testing, Pearson correlation, and the coefficient of determination. The findings showed a positive and moderate correlation between creativity and the ability to solve HOTS science questions, which was statistically significant. Although other factors may also affect this ability, creativity was found to make a meaningful contribution. The study concludes that creativity plays a crucial role in enhancing higher-order thinking skills, and it recommends that teachers integrate strategies that foster creativity in science education.

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ABSTRAK

Kemampuan penyelesaian soal Higher Order Thinking Skills (HOTS) pada mata pelajaran IPA di sekolah dasar perlu ditingkatkan karena masih banyak murid yang kesulitan mengerjakan soal yang memerlukan penalaran tingkat tinggi. Kondisi ini penting untuk diteliti karena penguasaan HOTS merupakan tuntutan kurikulum abad ke-21 yang menekankan kemampuan analitis, kritis, dan kreatif sebagai bekal menghadapi tantangan global. Kreativitas diduga menjadi salah satu faktor yang memengaruhi kemampuan ini. Penelitian ini bertujuan mengetahui hubungan antara kreativitas dengan kemampuan penyelesaian soal HOTS IPA murid kelas V SD Negeri 003 Tambusai. Penelitian menggunakan metode kuantitatif dengan pendekatan korelasional. Sampel berjumlah 79 murid yang dipilih dengan teknik total sampling. Instrumen yang digunakan berupa lembar kuesioner kreativitas dan lembar tes kemampuan penyelesaian soal HOTS IPA, dengan analisis data meliputi uji normalitas, uji linearitas, korelasi Pearson, dan koefisien determinasi. Hasil penelitian menunjukkan bahwa terdapat hubungan positif dengan kekuatan sedang antara kreativitas dan kemampuan penyelesaian soal HOTS IPA, yang signifikan secara statistik. Kreativitas berkontribusi terhadap kemampuan penyelesaian soal HOTS IPA, meskipun masih ada faktor lain yang memengaruhinya. Disimpulkan bahwa kreativitas berperan penting dalam meningkatkan keterampilan berpikir tingkat tinggi, sehingga guru disarankan mengintegrasikan strategi pembelajaran yang mendorong kreativitas dalam pembelajaran IPA.

Kata Kunci: *HOTS; kreativitas; penyelesaian-masalah; sains; sekolah dasar*

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INTRODUCTION

Education in the 21st century reflects four key aspects: critical thinking and problem-solving, creativity and innovation, communication, and collaboration. The Higher Order Thinking Skills (HOTS) approach is being implemented to develop learners who excel academically and are capable of addressing real-world problems. Creativity is the ability to generate new ideas, innovative solutions, and original works that have value. In everyday life, creativity plays an important role in solving problems, overcoming challenges, and creating new opportunities. Therefore, the development of individual creativity has become a central focus across various fields, including education, work, and personal development.

Creative thinking ability plays an important role in helping students solve HOTS-oriented questions. Creativity is closely related to divergent thinking patterns, namely the ability to generate a variety of solutions to a single problem (Febry et al., 2022). Through this way of thinking, students can view problems from multiple perspectives, connect concepts, and develop innovative solutions. Teachers, therefore, need to think creatively about how to implement HOTS-based evaluation so that students become accustomed to continuously sharpening their creative thinking abilities (Kumala et al., 2024).

At the elementary education level, fostering creativity from an early age is essential to help students become accustomed to thinking flexibly and avoid fixation on a single correct answer. Creative students in solving HOTS-oriented tasks generally demonstrate original thinking, design effective solutions, and do not rely solely on memorisation. They can understand the core of the problem, analyse the available data, and relate it to prior knowledge or experience. Students with high levels of creativity are also more confident, independent, and willing to try new approaches, provided these approaches are supported by logical reasoning (Nayudyantika et al., 2024). They also exhibit strong curiosity and actively seek information to strengthen their responses. Students' creativity also contributes to their ability to solve HOTS questions flexibly and adaptively.

In the context of the digitalisation era, creativity is not only a source of added value but also a key pillar of progress, economic growth, and social development (Arestya et al., 2024). One of them is that creativity contributes to the development of divergent thinking skills, which underpin the ability to answer HOTS (Higher Order Thinking Skills) questions. The creative process is closely related to cognitive development and can enhance a child's ability to express ideas clearly (Purwati et al., 2022). In addition, the importance of developing creativity from an early age as a foundation for navigating the future, including the creation of new job opportunities, is also strongly emphasised (Safitri et al., 2025).

The implementation of HOTS-based learning in science subjects continues to face various obstacles at SD Negeri 003 Tambusai. One of the most prominent difficulties is students' limited ability to understand questions that present complex information or require multiple instructions. For example, when asked to explain the water cycle, most students provide only simple answers, such as “rainwater falls to the earth,” without describing the interconnections among the processes within the cycle systematically. Similar conditions are also evident in questions that require cross-contextual thinking, such as linking changes in the states of matter to everyday events, such as cooking. In questions about phenomena that demonstrate heat transfer by conduction, most students still make errors in selecting the correct answer.

Teachers can observe that students encounter obstacles in understanding basic science concepts, which, in turn, affect their self-confidence and initiative in creative thinking. Creativity directly affects students’ success in solving HOTS-oriented questions. This aligns with the view that students with higher levels of creativity tend to have a better understanding of the material and answer HOTS questions more effectively (Widyastuti et al., 2024). However, many elementary schools, such as SD Negeri 003 Tambusai, still rely

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on conventional teaching methods that limit students' opportunities for expression. Creativity can be developed through collaborative learning methods, problem-based learning approaches, and effective use of technology to support active and meaningful learning experiences (Nursaya'bani et al., 2025). Science learning (IPA) at SD Negeri 003 Tambusai remains monotonous and has not yet fostered imaginative or collaborative thinking. Students are not accustomed to addressing open-ended, complex questions. In addition, many teachers have not yet developed a deep understanding of the HOTS concept within the context of Science (IPA) learning.

This study warrants further examination because many students continue to experience difficulties with Science (IPA) questions that require analytical skills and the application of concepts. According to Anderson and Krathwohl, analytical skills are part of HOTS and are situated at a higher level of thinking, which is essential for understanding scientific concepts in depth. If students are not trained in this ability, they will have difficulty linking factual information with scientific concepts (Istiqomah et al., 2024). This study is expected to identify more appropriate learning methods to improve students' critical and creative thinking abilities in understanding and solving IPA questions. Thus, creativity is not merely an additional attribute but a key factor in students' success in HOTS tasks. Without creativity, students tend to think at a lower cognitive level. Therefore, it is important to investigate the role of student creativity in solving HOTS-based IPA questions, particularly at SD Negeri 003 Tambusai. Creativity is crucial to develop from an early age because it significantly influences multiple aspects of early childhood development (Said-Metwaly et al., 2021). If children's creativity is not developed from an early age, their intellectual ability and thinking fluency will not develop optimally, because producing a product and demonstrating high creative talent requires a sufficiently high level of intelligence. This study aims to determine the relationship between creativity and the ability to solve HOTS IPA questions among fifth-grade students at SD Negeri 003 Tambusai.

This study offers novelty by focusing on examining the relationship between students' creativity and their ability to solve HOTS IPA questions. By examining the context of SD Negeri 003 Tambusai, this research is expected to make a new contribution to the understanding of the importance of creativity in supporting students' higher-order thinking skills.

LITERATURE REVIEW

Creativity

In the 21st century, learning is about awakening the ability to ask questions, create, understand creativity, and develop other skills (Zulyusri et al., 2023). Through creativity, students can independently explore the provided tools, thereby gaining knowledge, skills, and attitudes through their own experiences. In this way, learning becomes more meaningful because students are directly involved in the process of discovering and understanding concepts. Therefore, the use of tools that incorporate educational elements is essential to support the development of students' creativity and learning experiences (Abidin et al., 2022). In Piaget's theory of cognitive development, creativity is a function of assimilation and accommodation, which work in complementary ways to form knowledge as a schema of action aimed at achieving equilibrium (Al-Furqon et al., 2023).

A child is considered creative when they display certain characteristics, including: (1) a tendency to be active; (2) engaging in exploration, experimentation, manipulation, playful activities, asking questions, and making guesses; (3) using imagination when engaging in role play, language play, or storytelling; (4) being able to concentrate on a single task for a relatively long period of time; (5) arranging or organizing things according to personal preference; (6) carrying out activities together with adults; and (7) repeating activities in order to gain deeper understanding (Inayah & Sya, 2022). Through creativity, new ideas and innovations emerge, leading to improvement and progress. Every human being is endowed with an inner potential that

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can foster and empower creative action. Conversely, individuals are often preoccupied with the search for identity and consistency within monotonous, routine attitudes, which can confine them to narrow limits. In the face of various challenges and diverse learning models, educators, as key actors in the learning process, need to cultivate creative thinking that generates intelligent solutions. The field of education, therefore, requires creative thinking to address and resolve the many problems encountered, particularly within the teaching and learning process (Rindiantika, 2021). The characteristics of creativity can be grouped into two categories, namely cognitive and non-cognitive (Mustika et al., 2020). The cognitive characteristics include originality, flexibility, fluency, and elaboration, while the non-cognitive characteristics encompass motivation, attitudes, and personality. Creativity can emerge only from individuals who are intellectually capable and possess healthy psychological functioning.

HOTS Problem-Solving Skills

Ability encompasses the capabilities, competencies, strengths, and potential a person possesses (Wardah et al., 2025). Within the scope of this study, the ability referred to relates to students' competence in solving Higher Order Thinking Skills (HOTS)–type questions. In practice, HOTS encompasses advanced thinking abilities that involve in-depth analysis, evaluation of information, and the creation of solutions to complex problems. Limpan emphasises that higher-order thinking is a harmonious combination of critical and creative thinking, in which both are interconnected and grounded in human values, logic, and intuition. In this regard, the thinking process is not linear but reflective and contextual.

According to Brookhart, HOTS is not merely a type of question or an evaluation based on complex options, but rather a learning strategy that emphasises students' ability to transfer the knowledge they have acquired in order to solve non-routine problems (Tasrif, 2022). In this context, the teacher serves as a facilitator, creating thinking challenges relevant to real-life situations and encouraging students' intellectual exploration. Furthermore, Lewis and Smith state that higher-order thinking involves active information processing, in which individuals do not merely absorb knowledge but also manage and transform it into solutions to complex, dynamic problems.

HOTS is a thinking process of learners at a higher cognitive level that is developed from various cognitive concepts and methods, as well as learning taxonomies, such as the problem-solving method, Bloom's taxonomy, and taxonomies of learning, instruction, and assessment (Mitana et al., 2021). There are three characteristics of HOTS-based questions. (Latifah et al., 2023).

1. Higher-order thinking skills are advanced cognitive abilities that include problem-solving, critical and creative thinking, decision-making, and the ability to express opinions.
2. Using engaging problems drawn from the surrounding environment (contextual). In HOTS-based assessment, the evaluation involves real-life situations, so that students are expected to apply the knowledge or basic concepts they have learned to solve problems they encounter in their everyday environment.
3. Using varied types of questions. The use of diverse question formats is intended to provide detailed, comprehensive, and thorough assessment information about students' abilities as participants in the evaluation process.

Characteristics of Elementary School Students

Students at the elementary school level are generally in the concrete operational stage of cognitive development, which occurs between ages 7 and 11 (Purwulan, 2024). At this stage, children begin to show

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significant progress in learning behaviours, such as viewing the world objectively, developing logical thinking about real, observable phenomena, understanding various concrete events, and classifying objects by specific characteristics.

The emotional aspect of elementary school-aged children is generally characterised by quick emotional expressions that appear and fade rapidly (Jannah & Zen, 2025). Their emotions tend to be brief and are often expressed clearly through attitudes or actions. In many cases, children at this stage tend to seek to appear strong and superior to others. Elementary school students can be classified by grade level: lower-grade students (grades 1–3) and upper-grade students (grades 4–6), each with distinct developmental characteristics (Umam, 2022). Therefore, learning approaches and strategies need to be adjusted to the needs of each developmental phase. According to Piaget's theory of development, lower-grade students, aged approximately 6–9 years, are in transition from the preoperational to the concrete operational stage.

Based on the experts' opinions, it can be concluded that elementary–school–aged children, particularly those aged 6–11 years, exhibit distinctive characteristics in their cognitive and emotional development. At this stage, children are not yet able to think abstractly or engage in reversible thinking; therefore, learning approaches grounded in real experiences and concrete objects are essential to support their understanding. Teachers play an important role in designing learning strategies that align with children's developmental stages, so that the material delivered can be more easily received and effectively understood by learners.

METHODS

This study employs a quantitative correlational design to determine the extent of relationships among variables without imposing any special treatment on research participants. The selection of this design is based on the researcher's objective of identifying the relationship between students' levels of creativity and their ability to solve IPA questions that measure Higher Order Thinking Skills (HOTS) in grade V at SD Negeri 003 Tambusai. The population of this study comprises all Grade V students at SD Negeri 003 Tambusai, totalling 79 students. This study employs a total sampling technique, in which all individuals in the population are included as research participants; therefore, the sample comprises 79 Grade V students from SD Negeri 003 Tambusai. In collecting the data, the researcher uses test question sheets to measure students' ability to solve HOTS IPA questions and a questionnaire to measure students' creativity. The instrument grids for the HOTS test questions **(see Table 1)** and the student creativity questionnaire **(see Table 2)** are presented below.

Table 1. HOTS Science Question Outline

Variabel	Aspect	Indicator	Item Number	Total
Ability to Answer HOTS-Type Questions	Analysing (C4)	Able to explain the causes of disorders in the human respiratory system (e.g., inhaling polluted air, smoking, and infection by germs)	1-8	8
	Evaluating (C5)	Able to distinguish between abdominal breathing and chest breathing	9-16	8
	Creating (C6)	Able to create a model of the human respiratory system and demonstrate it	17-24	8

Source: Researcher Modification (2025)

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Table 2. Outline of Creativity Questionnaire

Indicator	Sub-Indicator	Item Number	Total
Have a great curiosity	1. Interested in learning more about the topic 2. Feeling compelled to find out more 3. I would be happy to find the answer to the question	1-3	3
Diligent and not easily bored	1. Completing assignments or homework even though they are difficult 2. Don't give up easily 3. Feeling challenged and not bored 4. Be enthusiastic when given challenging tasks	4-7	4
Confident and independent	1. Doing assignments without always being guided by the teacher 2. Trying to find a solution 3. Don't be anxious	8-10	3
Feeling challenged	1. Feeling challenged when the material is difficult 2. Interested in new material	11-12	2
Daring to take risks	1. Dare to tackle difficult problems 2. Dare to look for alternatives	13-14	2
Divergent thinking	1. Convenient for searching for various alternative answers 2. Generating many different ideas	15-16	2

Source: Researcher Modification (2025)

In this study, an instrument test was conducted using HOTS questions and questionnaires through a series of testing stages. The results of the construct validity test show that all test items are declared valid, with $r_{calculated}$ values greater than the r_{table} value of 0.444. The content validity test, validated by experts, achieved a percentage of 83% and was deemed feasible for use. Furthermore, the reliability test yielded a questionnaire reliability of 0.859 and a test-item reliability of 0.919, both of which fall within the very reliable category. Based on the item difficulty analysis, all 24 items are classified as easy to moderate, comprising 14 items in the easy category and 10 HOTS items in the moderate category. Meanwhile, the item discrimination analysis also shows moderate and easy categories, indicating that the instrument is suitable for use in this study.

Correlation coefficient analysis was used to assess the strength of the relationship between two variables, namely creativity (X) and the ability to solve HOTS IPA questions (Y), among fifth-grade students at SDN 003 Tambusai. In addition to the correlation coefficient analysis, the researcher conducted a coefficient of determination (R^2) test, which measures the proportion of the variation in the dependent variable that is explained by the independent variable. The hypotheses proposed in this study are as follows.

Ho: There is no relationship between creativity and the ability to solve HOTS IPA questions among fifth-grade students of SD Negeri 003 Tambusai.

Ha: There is a relationship between creativity and the ability to solve HOTS IPA questions among fifth-grade students of SD Negeri 003 Tambusai.

RESULTS AND DISCUSSION

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Normality Test

The normality test is a statistical procedure used to determine whether the data distribution in a population follows a normal distribution pattern. In this study, the Kolmogorov method was selected for the normality test because the sample size was 79, which is greater than 50. The importance of a normal distribution lies in ensuring the validity of subsequent analytical procedures, including hypothesis testing. If the data distribution deviates from normality, the results of further analyses may become unreliable. The results of the normality test are presented in **Table 3.**

Table 3. Normality Test

One-Sample Kolmogorov-Smirnov Test		
		Unstandardized Residual
N		79
Normal Parameters[a,b]	Mean	,0000000
	Std. Deviation	9,43599569
Most Extreme Differences	Absolute	,085
	Positive	,059
	Negative	-,085
Test Statistic		,085
Asymp. Sig. (2-tailed)		,200[c,d]

Source: Research Data Results 2025

Based on **Table 3**, the results of the normality test using the One-Sample Kolmogorov–Smirnov Test indicate that the Asymp. Sig. (2-tailed) value is 0.200, which is greater than the significance level of 0.05. This means that the null hypothesis (H_0), which states that the residual data are normally distributed, cannot be rejected. Therefore, it can be concluded that the residual data in this study follow a normal distribution. This condition satisfies one of the assumptions required for conducting parametric statistical tests, thereby enabling further analysis.

Linearity Test

The linearity test is used to determine whether the relationship between two variables is linear, as a prerequisite before conducting correlation or regression analysis. A relationship is considered linear when the significance value of Deviation from Linearity is greater than 0.05, indicating that there is no significant deviation from the linear model. Based on the analysis, the p-value (0.105 > 0.05); therefore, the relationship between variable X and variable Y is linear.

Table 4. Linearity Test

ANOVA Table							
			Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Y * X	Between Groups	(Combined)	4660,710	12	388,392	4,708	,000
		Linearity	3161,035	1	3161,035	38,314	,000
		Deviation from Linearity	1499,675	11	136,334	1,652	,105

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ANOVA Table					
		Sum of Squares	df	Mean Square	F	Sig.
	Within Groups	5445,290	66	82,504		
	Total	10106,000	78			

Source: Research Data Results 2025

Based on the results of the Deviation from Linearity test in **Table 4**, the obtained Fhitung value is 1.652, which is smaller than the Ftabel value of 1.99, with a significance value of 0.105, which exceeds the significance level of 0.05. This condition indicates that the difference between the research data and the linear relationship model is not statistically significant. In other words, the pattern of the relationship between variables X and Y does not deviate from a straight-line form. Therefore, it can be concluded that the relationship between the two variables is linear, indicating that the linearity assumption is satisfied, and that parametric statistical analyses that require a linear relationship can be conducted appropriately.

Correlation Coefficient Test

Correlation coefficient analysis was used to assess the strength of the relationship between two variables: creativity (X) and the ability to solve HOTS science questions (Y) among fifth-grade students at SDN 003 Tambusai. Hypothesis testing was conducted to determine the strength and direction of the relationship.

Table 5. Correlation Coefficient Test

Correlations			
		X	Y
X	Pearson Correlation	1	,559**
	Sig. (1-tailed)		,000
	N	79	79
Y	Pearson Correlation	,559**	1
	Sig. (1-tailed)	,000	
	N	79	79

Source: Research Data Results 2025

Based on the results of Pearson's correlation analysis in Table 5, a correlation coefficient of 0.559 (positive) was obtained, indicating a moderate relationship between variables X and Y. The significance value (Sig. 1-tailed) of 0.000 is less than 0.01, indicating that the relationship is significant at the 99% confidence level. This positive relationship indicates that an increase in variable X tends to be followed by an increase in variable Y, and vice versa. Thus, Ho is rejected, and Ha is accepted, indicating a significant relationship between creativity and the ability to solve HOTS science questions among fifth-grade students at SD Negeri 003 Tambusai.

Coefficient of Determination Test (R^2)

Table 6. Coefficient of Determination Test

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Model Summary[b]				
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	,559[a]	,313	,304	9,497

a. Predictors: (Constant), X
b. Dependent Variable: Y
Source: Research Data Results 2025

Based on the results in Table 6, the correlation coefficient (R) was 0.559, indicating a moderate positive relationship between variable X (creativity) and variable Y (HOTS science problem-solving ability). The R2 value of 0.313 indicates that creativity accounts for 31.3% of the variance in students' HOTS science problem-solving ability, with the remaining 68.7% attributable to factors other than creativity. These findings confirm that creativity is one of the factors influencing students' ability to solve HOTS science questions, although it is not the sole determinant. Therefore, in science learning, efforts to increase students' creativity can be an effective strategy to optimise their ability to solve questions that require higher-order thinking skills.

Discussion

The study results indicate a significant relationship between creativity and the ability to solve HOTS science questions among fifth-grade students at Tambusai Public Elementary School 003. The Pearson correlation coefficient of 0.559, with a positive sign, indicates that higher student creativity is associated with better performance on science questions requiring higher-order thinking skills. This relationship is classified as moderate and significant at the 99% confidence level, indicating that creativity supports students' ability to solve HOTS questions. Furthermore, an R^2 of 0.313 indicates that creativity accounts for 31.3% of the variance in solving HOTS science questions, with the remaining 68.7% attributable to factors other than creativity. These findings confirm that creativity is an important consideration in science education, although it is not the sole determinant. Therefore, learning that stimulates students' creativity can positively affect their ability to solve HOTS-based problems.

This study reinforces previous findings that solving HOTS questions requires critical and creative thinking skills, enabling students to solve problems (Febrianti et al., 2021). In addition, students responded to HOTS questions to assess their creative thinking skills, achieving high criteria; almost all students preferred to express their own ideas when responding. Creative thinking is considered highly important because it enables students to employ diverse methods and ideas to solve problems. All components of affective, cognitive, and metacognitive skills are included in creative thinking skills (Simbolon et al., 2024). Therefore, this understanding will advance education by enabling students to complete tasks aligned with this concept (Dalilan & Sofyan, 2022).

The 21st century presents students with the challenge of mastering multiple skills, one of which is creative thinking (Handayani, 2023). In the context of HOTS, questions are open-ended, meaning they have multiple correct solutions. When students are given open-ended questions, their responses also vary based on their learning experiences and level of creativity. In addition to classroom learning and higher-order thinking skills, intellectual ability also influences students' creative thinking. A person is good at solving problems when supported by good problem solvers (Maryanti et al., 2023). Three types of intelligence are important for generating creativity: 1) synthetic, 2) analytical, and 3) practical intelligence or thinking ability (Zendrato et al., 2024). The benefits of student creativity include problem-solving and the ability to convey new ideas. Other benefits include personal development and the ability to express oneself through creative output. Therefore, creativity is very useful in schools for problem-solving and other purposes.

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Creativity is characterised by flexibility, fluency, skill, and intelligence. The main aspects of creativity are the ability to recognise new situations and to solve problems in logical ways that generate creative concepts or ideas. Within the framework of educational reform, creativity is fostered by the ability to adapt materials, concepts, and techniques to produce student work that is distinct from that of other students (Yunianti & Maknun, 2024). This study implies that creativity plays a significant role in improving students' ability to solve HOTS questions in science subjects. Therefore, teachers need to integrate learning strategies that elicit creative ideas, broaden students' perspectives on problems, and encourage them to develop innovative solutions, including in evaluations that use HOTS questions (Triyono et al., 2025). Approaches such as project-based learning, hands-on experiments, and contextual problem-solving grounded in the surrounding environment can be effective alternatives.

This study has several limitations that need to be considered. First, the study was conducted at a single elementary school and had a limited sample size; therefore, the results cannot be generalized to other schools with different conditions. Second, the variables studied focused solely on creativity as a factor influencing the ability to solve HOTS science questions, whereas many other factors, such as learning motivation, critical thinking skills, teacher learning strategies, and learning environment support, were not analysed further.

CONCLUSION

The study's correlation analysis indicated a moderate positive relationship between creativity and students' ability to solve HOTS science questions. This means that students with high creativity tend to have better abilities in solving HOTS science questions. This relationship is statistically significant, confirming that creativity contributes meaningfully to problem-solving skills; however, other factors beyond creativity also influence it, including conceptual mastery, critical thinking, learning motivation, and teacher learning strategies. Overall, these results confirm that developing creativity is a key to improving students' higher-order thinking skills in elementary school science learning.

As a follow-up, this study recommends that teachers integrate learning strategies that stimulate student creativity, such as project-based approaches, problem-solving, and contextual experiments in science. In addition, further research is recommended to expand the scope by incorporating additional variables, such as learning motivation and critical thinking skills, and to conduct effectiveness tests using experimental designs. Thus, the results obtained provide a more comprehensive picture of the factors influencing elementary school students' ability to solve HOTS science questions.

AUTHOR'S NOTE

The author declares that there are no conflicts of interest related to the publication of this article. The author affirms that the article's data and content are free of plagiarism.

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