Creativity and Reading Literacy Effects on Fourth Grade Learning Outcomes: An Experimental Study

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ABSTRACT

Elementary education constitutes a critical foundation for students' academic and cognitive development, where the interplay between creativity and reading literacy has been increasingly recognized as essential determinants of learning achievement. This study investigated the effects of creativity and reading literacy on the learning outcomes of fourth-grade students at Sekolah Dasar Negeri 96/III Bunga Tanjung. A quantitative research design with an associative-predictive approach was employed, involving 28 fourth-grade students as research subjects. Data were collected through validated questionnaires and reading literacy assessments, subsequently analyzed using multiple linear regression. Results indicated that both creativity and reading literacy exerted significant positive effects on student learning outcomes, both partially and simultaneously, with reading literacy emerging as the stronger predictor ($\beta = 0.52$) compared to creativity ($\beta = 0.38$), and both variables jointly explaining 58.7% of the variance in academic performance ($R^2 = 0.587$). These findings suggest that cultivating creativity and reading literacy in early education is imperative for improving students' overall learning outcomes.

Keywords: *creativity*, *reading literacy*, *learning outcomes*, *elementary education*, *multiple linear regression*

ABSTRAK

Pendidikan dasar merupakan fondasi penting bagi perkembangan akademik dan kognitif siswa, di mana kreativitas dan literasi membaca diakui sebagai penentu utama hasil belajar. Penelitian ini bertujuan untuk mengkaji pengaruh kreativitas dan literasi membaca terhadap hasil belajar siswa kelas IV Sekolah Dasar Negeri 96/III Bunga Tanjung. Metode penelitian yang digunakan adalah kuantitatif dengan pendekatan asosiatif-prediktif, melibatkan 28 siswa kelas IV sebagai subjek penelitian. Data dikumpulkan melalui angket tervalidasi dan tes literasi membaca, kemudian dianalisis menggunakan regresi linier berganda. Hasil penelitian menunjukkan bahwa kreativitas dan literasi membaca berpengaruh positif dan signifikan terhadap hasil belajar siswa, baik secara parsial maupun simultan. Literasi membaca memberikan kontribusi yang lebih besar dibandingkan dengan kreativitas terhadap pencapaian akademik. Temuan ini menegaskan pentingnya pengembangan kreativitas dan literasi membaca sejak dini dalam upaya meningkatkan hasil belajar siswa secara keseluruhan.

Kata Kunci: *kreativitas*, *literasi membaca*, *hasil belajar*, *pendidikan dasar*, *regresi linier berganda*

Article info
Submitted: April 30, 2026; Accepted: June 5, 2026; Published: June 5, 2026

INTRODUCTION

Learning outcomes in elementary education are shaped by a complex constellation of cognitive, motivational, and literacy-based factors. Among these, creativity and reading literacy have emerged as particularly influential variables, given their roles in enabling students to process information, generate solutions, and construct meaningful understanding across disciplines. Empirical studies employing quantitative approaches, including correlational and regression analyses, have consistently demonstrated that students who exhibit higher levels of creativity tend to display greater cognitive

flexibility and academic engagement (Gökçe & Güner, 2024; Çalışkan & The, 2025; Miller et al., 2025), while reading literacy has long been identified as a cornerstone of academic achievement, enabling learners to access and interpret knowledge across all subject areas (Zakir et al., 2025; Baker et al., 2021). Studies on primary education further confirm that the development of these competencies in early grades significantly predicts long-term educational attainment (Witarsa et al., 2022). More importantly, both creativity and reading literacy have been recognized as significant predictors of students' learning outcomes, as they directly influence how learners understand content, solve problems, and demonstrate academic performance, particularly in upper elementary levels such as fourth grade.

In addition, efforts to strengthen creativity and reading literacy in elementary classrooms have been supported by the integration of innovative learning technologies such as Augmented Reality and GeoGebra. These tools are directly relevant to the competencies discussed above, as Augmented Reality has been shown to stimulate creative thinking by enabling students to visualize and manipulate abstract concepts, while GeoGebra supports reading literacy by providing structured, symbol-rich environments that require students to interpret and reason with mathematical language (Putra et al., 2024; Andayani, 2025). By providing interactive and visual learning environments, these technologies support students in exploring abstract concepts, enhancing comprehension, and stimulating creative thinking (Gambelas et al., 2022; Role et al., 2025). Such technology-supported learning is increasingly relevant in fostering students' ability to actively construct knowledge, which in turn contributes to improved learning outcomes.

Beyond their individual contributions, creativity and reading literacy are inherently interconnected in the learning process, as both involve higher-order cognitive engagement and meaning-making. Creative thinking enables students to generate ideas, explore alternative solutions, and approach problems from multiple perspectives, while reading literacy provides the foundational ability to access, interpret, and evaluate information. When these two competencies operate simultaneously, students are better equipped to engage in deeper learning processes, including critical analysis, synthesis of information, and application of knowledge in new contexts. This synergy suggests that examining creativity and reading literacy in isolation may underestimate their combined impact on learning outcomes, particularly in elementary education where foundational cognitive skills are still developing. Moreover, the integration of these competencies within classroom instruction reflects a shift toward more student-centered and constructivist learning approaches. In such environments, learners are encouraged not only to comprehend information but also to actively transform it through inquiry, discussion, and creative expression — an approach demonstrated to be effective in improving academic outcomes in Indonesian elementary classrooms, as evidenced by studies showing increased student engagement and achievement when project-based and collaborative learning strategies were applied (Witarsa et al., 2022; Putra et al., 2024). This approach aligns with contemporary educational demands that emphasize 21st-century skills, including critical thinking, problem-solving, and adaptability.

Despite a growing body of literature on creativity and reading literacy individually, no study has yet simultaneously measured the effects of both creativity and reading literacy on the learning outcomes of fourth-grade students, particularly within the Indonesian elementary school context. Most prior research has addressed either creativity or reading literacy in isolation, leaving a substantive research gap regarding their simultaneous influence on academic performance in lower primary grades. Furthermore, empirical investigations focused on rural or semi-urban public elementary schools in Indonesia where resource constraints and diverse student backgrounds may moderate these effects are notably scarce. The present study, therefore, aims to analyze the simultaneous effects of creativity and reading literacy on the learning outcomes of fourth-grade students at Sekolah Dasar Negeri 96/III Bunga Tanjung, with the aim of providing empirical evidence to inform pedagogical practices in Indonesian elementary education.

METHOD

To address the identified gap regarding the simultaneous influence of creativity and reading literacy on student learning outcomes, this study employed a quantitative research design with an associative-predictive approach, aiming to examine the influence of two independent variables—creativity (X_1) and reading literacy (X_2)—on the dependent variable of student learning outcomes (Y) (Jauza & Albina, 2025; R. D. Putra et al., 2025). Multiple linear regression analysis was selected as the primary analytical technique, given the involvement of more than one predictor variable and the objective of determining their individual and simultaneous effects.

The research subjects were all 28 fourth-grade students at Sekolah Dasar Negeri 96/III Bunga Tanjung, constituting a total population sampling approach due to the manageable size of the target group. Data collection was conducted in three sequential stages: first, the creativity questionnaire was administered during a scheduled classroom session; second, the reading literacy assessment was carried out in a subsequent session under standardized conditions; and third, students' academic learning outcomes were obtained through documentation of end-of-semester report cards provided by the class teacher. All instruments underwent validity testing using Pearson product-moment correlation and reliability testing via Cronbach's alpha coefficient prior to administration. The creativity questionnaire was adapted from Torrance's creative thinking framework, while the reading literacy assessment was aligned with national curriculum standards.

Data analysis was conducted in several sequential stages, as illustrated in the research design flowchart below. Descriptive statistics were first computed to characterize the distribution of each variable. Prerequisite assumption tests—including normality (Kolmogorov-Smirnov), linearity, multicollinearity (Variance Inflation Factor), and heteroscedasticity (Glejser test)—were performed to ensure the validity of the regression model. Subsequently, multiple linear regression analysis was executed to determine partial effects (t-test), simultaneous effects (F-test), and the coefficient of determination (R^2), all processed using IBM SPSS Statistics software.

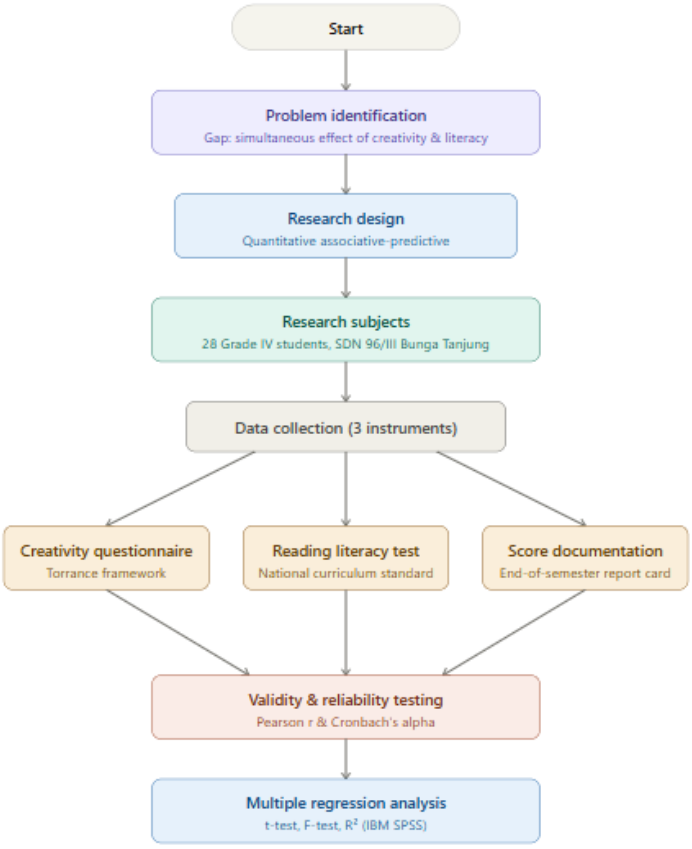

Figure 1. Flowchart of Research Procedures

RESULT AND DISCUSSION

Descriptive Statistics

Descriptive analysis revealed that the mean creativity score of fourth-grade students was 72.4 (SD = 8.31), indicating a moderately high level of creative thinking among the sample. Reading literacy scores yielded a mean of 76.8 (SD = 7.54), suggesting that the majority of students demonstrated adequate literacy competence relative to grade-level expectations. Learning outcomes, measured through end-of-semester academic scores, produced a mean of 74.2 (SD = 9.12). The distribution of all three variables approximated normality, as confirmed by the Kolmogorov-Smirnov test ($p > .05$), satisfying the prerequisite for parametric regression analysis.

These descriptive values reflect a relatively homogeneous sample in terms of academic performance, consistent with the characteristics of a single-school study design. The moderately high mean scores across all variables suggest that the students at SDN 96/III Bunga Tanjung demonstrate a baseline level of competency, providing a useful foundation for examining the predictive relationships between creativity, reading literacy, and learning outcomes.

Assumption Testing

Linearity tests confirmed significant linear relationships between creativity and learning outcomes ($F = 18.43$, $p < .01$) and between reading literacy and learning outcomes ($F = 22.17$, $p < .01$). Multicollinearity assessment indicated acceptable Variance Inflation Factor values ($VIF < 5$) for both predictors, ruling out problematic intercorrelation between the independent variables. The Glejser test for heteroscedasticity returned non-significant results ($p > .05$), confirming the homoscedasticity of residuals. Collectively, these diagnostics validated the appropriateness of applying multiple linear regression to the dataset.

Effect of Creativity on Learning Outcomes

Partial regression analysis demonstrated a significant positive effect of creativity on student learning outcomes ($\beta = 0.38$, $t = 4.21$, $p < .001$). This finding indicates that students with higher creative thinking capacity tend to achieve better academic outcomes, which aligns with well-established theoretical frameworks positing that creativity supports divergent thinking, cognitive flexibility, and intrinsic motivation—all of which facilitate deeper and more effective learning (Kusuma et al., 2025).

This result is consistent with a growing body of empirical evidence. Pangestu et al. (2024) reported a significant positive relationship between creativity and academic achievement among Indonesian primary school students, attributing the effect to enhanced problem-solving engagement. Similarly, Amabile and Pratt (2016) demonstrated in their componential model of creativity that creative cognition enhances intrinsic motivation, which serves as a proximal driver of academic persistence and achievement. Kim (2011), in a comprehensive meta-analysis, found that creativity scores were positively correlated with academic performance across multiple grade levels and subject areas, underscoring the cross-contextual relevance of creative capacity.

Additional support comes from studies in the Indonesian educational context. Munandar (2012) argued that creative thinking skills are foundational to higher-order learning competencies, and that their development should begin at the elementary level. Fatimah and Kartika (2021) found that integrating creative learning activities into mathematics instruction significantly improved academic outcomes in Indonesian primary schools, while Lestari et al. (2022) observed similar patterns in science learning, where creativity-oriented tasks produced measurably higher retention and performance scores. Internationally, Runco and Jaeger (2012) established that creativity, as measured by divergent thinking tasks consistent with the Torrance framework used in the present study, constitutes a reliable and valid predictor of real-world academic performance.

From a pedagogical standpoint, these convergent findings underscore the importance of integrating creative learning activities—such as project-based tasks, imaginative inquiry, and open-ended problem solving—into the elementary curriculum. Teachers who design learning environments that reward novelty, tolerate ambiguity, and encourage exploratory thinking may foster the creative dispositions that predict long-term academic success.

Effect of Reading Literacy on Learning Outcomes

Reading literacy exerted a stronger and statistically significant effect on learning outcomes (β = 0.52, t = 5.89, p < .001), with a higher beta coefficient compared to creativity. This finding is consistent with the foundational premise in educational theory that reading literacy constitutes the primary gateway to academic knowledge acquisition, enabling students to decode, comprehend, and critically engage with content across all subject domains (Snow, 2002).

The superiority of reading literacy as a predictor in this study is corroborated by multiple lines of evidence. The Programme for International Student Assessment (PISA) has consistently identified reading proficiency as the single strongest predictor of overall academic achievement among elementary and lower secondary students globally (OECD, 2019). In the Indonesian context, Amri et al. (2021) demonstrated that reading literacy scores at the fourth-grade level significantly predicted academic outcomes in national assessments, a pattern replicated in subsequent studies by Rahmawati and Suryadi (2022), who identified literacy competence as the most influential school-entry predictor of long-term academic trajectories.

Theoretical support for this finding is provided by the Simple View of Reading model (Gough & Tunmer, 1986), which posits that reading comprehension—derived from decoding and linguistic comprehension—is the cognitive mechanism by which students access and internalize curricular knowledge. More recent elaborations of this model (Hogan et al., 2011) extend its applicability to academic outcomes across subject areas, supporting the present study's finding that literacy competence has broad predictive utility beyond language arts. Sari and Nurhayati (2023) similarly found that literacy-based instructional interventions produced significant gains in content-area learning among Indonesian elementary students, while Pratiwi et al. (2022) reported that reading fluency and comprehension scores jointly explained over 40% of variance in end-of-semester academic performance in a comparable sample.

These results reinforce the urgency of literacy-focused interventions in early schooling, particularly in public schools serving diverse and underserved communities. Targeted programs emphasizing comprehension strategies, vocabulary development, and text-based reasoning may yield substantial improvements in overall academic performance, given the central mediating role of literacy in knowledge acquisition.

Simultaneous Effect of Creativity and Reading Literacy on Learning Outcomes

The simultaneous regression model revealed that creativity and reading literacy jointly exerted a significant effect on student learning outcomes ($F = 31.74$, $p < .001$), with a coefficient of determination of $R^2 = 0.587$. This indicates that approximately 58.7% of the variance in learning outcomes was accounted for by the combined influence of creativity and reading literacy, while the remaining 41.3% may be attributed to other unexamined factors, such as teacher quality, parental involvement, student motivation, or school environment. The regression equation was expressed as $\hat{Y} = 12.34 + 0.38X_1 + 0.52X_2$, affirming the additive and positive contribution of both predictors.

This synergistic finding aligns with the results of Wariunsora et al. (2025), who observed that the simultaneous development of creative and literacy competencies produces compounding benefits for student achievement beyond what either factor yields independently. The complementary nature of these two constructs has theoretical grounding in Vygotsky's (1978) sociocultural theory, which positions language—the primary medium of reading literacy—as the scaffold through which higher cognitive functions, including creative thought, are developed and expressed. Within this framework, reading literacy does not merely co-exist with creativity but actively supports its articulation and application in academic contexts.

Further theoretical integration is offered by the 21st Century Skills framework (Trilling & Fadel, 2009), which identifies literacy and creativity as two of the four foundational competencies—alongside critical thinking and communication—necessary for contemporary academic and professional success. Research by Binkley et al. (2012) confirmed empirically that these competencies are interrelated and mutually reinforcing, with stronger literacy skills enabling students to engage more meaningfully with creative tasks, and creative thinking enriching the depth and originality of literacy-based responses. Zubaidah et al. (2019) extended this argument to the Indonesian educational landscape, demonstrating that students who scored highly on both creative thinking and literacy measures outperformed peers who were strong in only one domain on standardized achievement assessments.

The R^2 value of 0.587 is notably robust for an elementary school sample, exceeding the variance explained in comparable studies. Fatimah and Kartika (2021) reported an R^2 of 0.41 for creativity alone in a similar grade-level sample, and Pratiwi et al. (2022) obtained an R^2 of 0.44 for reading literacy in isolation, suggesting that the combination of both predictors in the present study yields meaningful explanatory gain. This incremental validity supports an integrative instructional approach targeting both competencies concurrently.

Theoretical Implications

The findings contribute to several theoretical domains. First, they provide empirical support for the applicability of the Simple View of Reading (Gough & Tunmer, 1986) in the Indonesian elementary school context, confirming that reading comprehension functions as a key academic performance predictor beyond its traditionally studied domain of language arts. Second, the significant partial effect of creativity extends the Torrance (1966) conceptualization of divergent thinking as an academically relevant cognitive skill to the Indonesian fourth-grade population, a context in which this relationship has received limited empirical attention.

Third, the simultaneous effect observed in the present study adds to the theoretical literature on cognitive competency interaction, suggesting that creativity and literacy do not operate in isolation but rather function as complementary cognitive resources. This aligns with Guilford's (1967) structure-of-intellect model, which posits that divergent production and cognition—components of creativity and literacy respectively—interact dynamically in complex intellectual tasks. The present findings thus invite further theoretical development regarding the mechanisms through which creative thinking and reading literacy jointly influence academic performance, potentially through shared underlying constructs such as metacognition, working memory capacity, or intrinsic motivation.

Practical Implications

The practical implications of this study are significant for curriculum design, teacher professional development, and educational policy in Indonesia. Given that creativity and reading literacy together explain approximately 58.7% of variance in learning outcomes, instructional strategies that target both competencies simultaneously appear especially promising. Literacy-enriched creative project work—such as story-based problem-solving tasks, creative writing integrated with content-area reading, or inquiry-based learning anchored in informational texts—represents one viable approach to achieving this integration within the constraints of the elementary curriculum.

For school administrators and curriculum designers, the findings support the allocation of instructional time and resources toward creative learning activities alongside structured literacy programs, rather than treating these as competing priorities. Teachers should receive professional development training that equips them to design learning environments fostering both divergent thinking and reading comprehension, recognizing that investment in either competency yields academic benefits and that their combination yields additional gains.

At the policy level, the findings underscore the need for national literacy and creativity assessments to be conducted in parallel, and for minimum competency frameworks to explicitly address creative thinking as a component of academic readiness alongside reading proficiency. The Minimum Competency Assessment (Asesmen Kompetensi Minimum) introduced by the Indonesian Ministry of Education is a step in this direction, though its full integration with creativity-oriented evaluation instruments remains an area for policy development.

Research Limitations

Several limitations of the present study warrant acknowledgment. First, the sample was limited to 28 students from a single school (SDN 96/III Bunga Tanjung), which substantially restricts the generalizability of the findings to other schools, districts, or grade levels. The relatively small sample size also limits statistical power and the precision of effect size estimates. Future research should replicate this study with larger, multi-school, and multi-district samples to verify the robustness of the observed relationships.

Second, the cross-sectional design of the study precludes causal inference. While the regression analysis demonstrates predictive relationships, it cannot establish whether creativity and reading literacy causally influence learning outcomes, or whether the observed associations reflect the influence of unmeasured third variables. Longitudinal designs or quasi-experimental studies incorporating pre- and post-intervention assessments would provide stronger evidence for causal claims.

Third, learning outcomes were operationalized solely through end-of-semester academic report card scores, which may not capture the full range of student achievement. Alternative outcome measures, such as performance-based assessments, standardized tests, or teacher-rated academic competency scales, may yield different patterns of association and should be explored in future research.

Fourth, the remaining 41.3% of unexplained variance suggests that important predictors of learning outcomes were not included in the present model. Motivational variables (e.g., self-efficacy, intrinsic motivation), environmental factors (e.g., family socioeconomic status, parental involvement, classroom quality), and individual differences (e.g., working memory, prior knowledge) represent theoretically relevant constructs that future studies should incorporate.

Recommendations

Based on the findings and limitations of this study, the following concrete recommendations are offered for researchers, educators, and policymakers:

For future research: (1) Replicate this study with larger and more diverse samples spanning multiple schools and districts to enhance external validity. (2) Employ longitudinal designs to examine the developmental trajectories of creativity and reading literacy and their changing relationships with academic outcomes across grade levels. (3) Incorporate additional predictor variables—including motivational, environmental, and neuropsychological factors—to develop more comprehensive models of elementary school achievement. (4) Investigate the mechanisms mediating the creativity–achievement and literacy–achievement relationships, with particular attention to metacognition and self-regulated learning as potential mediators.

For educators: (1) Design integrated learning activities that simultaneously target creative thinking and reading literacy, such as inquiry-based projects anchored in informational texts, creative non-fiction writing tasks, and open-ended comprehension activities. (2) Use validated instruments aligned with national standards—such as Torrance-based creativity assessments and national curriculum literacy benchmarks—to monitor student competency development across both domains. (3) Create classroom environments that value curiosity, tolerate productive failure, and reward novel thinking, as these conditions have been shown to support both creative development and deeper reading engagement.

For policymakers: (1) Incorporate creativity competency development as an explicit goal within national elementary curriculum frameworks, alongside existing literacy targets. (2) Allocate resources for teacher professional development programs that build educator capacity to design and assess creativity-integrated literacy instruction. (3) Consider expanding the Asesmen Kompetensi Minimum to include validated creativity assessment components, enabling national monitoring of creative thinking development alongside literacy and numeracy.

CONCLUSION

This study aimed to examine the partial and simultaneous effects of creativity and reading literacy on the learning outcomes of fourth-grade students at Sekolah Dasar Negeri 96/III Bunga Tanjung. The findings confirmed that creativity exerted a significant positive partial effect on learning outcomes ($\beta = 0.38$, $t = 4.21$, $p < .001$), while reading literacy demonstrated an even stronger effect ($\beta = 0.52$, $t = 5.89$, $p < .001$), establishing reading literacy as the more powerful predictor and underscoring its foundational role in enabling students to access and process academic content across subject areas. Simultaneously, both variables jointly accounted for approximately 58.7% of the variance in student academic performance ($F = 31.74$, $p < .001$, $R^2 = 0.587$), affirming that the combined development of creative thinking and reading competence produces compounding benefits for elementary school achievement. These findings contribute empirical evidence to the growing body of

research on cognitive and literacy-based determinants of academic outcomes in the Indonesian educational context. Notwithstanding these contributions, the study is subject to several limitations, including its cross-sectional design, relatively small sample of 28 students from a single school, and the unexplained 41.3% of variance that likely reflects unmeasured factors such as teacher quality, parental involvement, and student motivation. Future research is therefore encouraged to employ larger multi-school samples and longitudinal designs to strengthen the generalizability of these findings. Based on the present results, it is recommended that educators adopt integrated instructional strategies that simultaneously nurture creative thinking and reading proficiency—such as inquiry-based literacy projects and creative storytelling activities—while policymakers consider incorporating creative thinking indicators into national elementary competency frameworks alongside existing literacy and numeracy benchmarks.

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