



THE CORRELATION BETWEEN POCKET MONEY AND MATHEMATICS LEARNING OUTCOMES: A QUANTITATIVE STUDY OF SIXTH-GRADE STUDENTS

Handika Suryatama^{a*}, Aditya Nugrahanta^b, Nurfadhilah Jati Kusuma^c, Leonardus Rangga Satrio Nugroho^d, Deny Hadi Siswanto^e

^a Faculty of Education; handikasuryatama.2022@student.uny.ac.id; Yogyakarta State University; Indonesia

^b Faculty of Education; adityahu@gmail.com; Yogyakarta State University; Indonesia

^c Faculty of Education; jatikusumak699@gmail.com; Yogyakarta State University; Indonesia

^d Faculty of Education; ranggagayam@gmail.com; Yogyakarta State University; Indonesia

^e Mathematics Teacher; denysiswanto11@guru.sma.belajar.id; Muhammadiyah Mlati High School, Indonesia

* Penulis Korespondensi: Handika Suryatama

ABSTRACT

Learning progress will only be achieved if the environment is supportive; therefore, parents are expected to act more wisely regarding providing pocket money. This study uses a quantitative approach with a survey research method employing a questionnaire to investigate the relationship between pocket money and mathematics learning outcomes among sixth-grade elementary school students at Karangtengah 2 Elementary School. A total of 17 students participated as the sample in this study. Information was collected through questionnaires and relevant documentation reviews. Data analysis was conducted using descriptive statistical techniques and inferential statistical methods. The R square test analysis yielded a result of 0.0174, indicating that the influence of pocket money on mathematics learning outcomes is 1.74%, while 98.26% is influenced by other variables not examined. Based on these findings, there is a positive, though not significant, relationship between the provision of pocket money and the level of motivation in learning mathematics among students. Additionally, the findings indicate a potential positive relationship with motivation, but the direct effect on learning outcomes is minimal and not statistically significant among sixth grade students at Karangtengah 2 Elementary School.

Keywords: *Pocket Money; Learning Outcomes; Mathematics; Elementary School*

1. INTRODUCTION

The Programme for International Student Assessment (PISA) is an international assessment initiative organized by the Organisation for Economic Co-operation and Development (OECD) to evaluate education systems worldwide by measuring the academic performance of 15-year-old students in mathematics, science, and reading literacy. Since 2012, PISA has also included a financial literacy assessment conducted every three years. The results of the 2012 PISA financial literacy assessment revealed that many adolescents lacked a basic understanding of fundamental financial concepts [1]. Furthermore, the 2015 assessment indicated that students' personal experiences with financial matters were among the most influential factors affecting financial literacy levels [2]. These findings highlight the importance of financial exposure and support during adolescence, particularly within the family environment, as part of students' broader educational development.

The 2022 PISA results showed that Indonesia experienced an improvement in international ranking, rising five to six positions compared to 2018 across the three assessed domains [3]. However, despite this improvement in rank, students' average performance in mathematics declined. Indonesia's mathematics score decreased from 379 in 2018, when it ranked 73rd, to 366 in 2022, with a ranking of 70th. This paradoxical outcome an increase in ranking alongside a decline in score indicates that Indonesian students' mastery of mathematical concepts remains insufficient. The decline in mathematics performance suggests that students continue to face challenges in understanding mathematical content, which may be attributed to factors such as instructional quality, availability of learning resources, and the effectiveness of assessment strategies [4].

These conditions signal an urgent need for improvements in mathematics teaching and learning practices within the Indonesian education system.

Mathematics is widely recognized as a complex subject that involves numerical operations, abstract reasoning, measurement, patterns, and logical structures. Siswanto et al. [5] describe mathematics as a discipline that focuses on numbers, calculations, relationships, systems, and structures as tools for thinking. Due to its complexity, mathematics is often perceived by elementary school students as difficult and intimidating. Many students develop negative attitudes toward the subject, leading to low interest and motivation, a phenomenon also noted by Joblonsky [6], who found that mathematics is generally disliked and feared by learners. At the elementary level, students are still highly dependent on parental support, including financial support in the form of pocket money, to meet their school-related needs. This dependency highlights the potential role of family-provided resources in shaping students' learning experiences and attitudes toward mathematics.

Learning motivation plays a crucial role in students' success in mathematics. Loukomies et al. [7] identified low learning motivation as one of the primary factors contributing to poor academic performance among students. Insufficient motivation may stem from low interest in mathematics, unsupportive external environments such as family and peers, or negative emotional experiences during learning. Mathematics anxiety, in particular, can hinder students' concentration and negatively affect academic achievement [8]. Enhancing students' self-confidence and reducing anxiety are therefore essential strategies for improving learning outcomes. Research has also shown that learning motivation has a strong and positive relationship with academic achievement, and that increases in motivation tend to result in better learning outcomes [9], [10]. One practical way to stimulate motivation is through the provision of rewards, including financial incentives such as pocket money.

Family socioeconomic status and financial support are important determinants of children's educational achievement. Vásquez et al. [11] emphasized that family wealth and the resources allocated to education significantly influence students' literacy and numeracy performance. Parents with higher socioeconomic status are generally better able to provide supportive learning environments, which contributes to higher academic achievement among their children. Pocket money, defined as a small amount of money given regularly by parents to their children, can function as both practical support and a motivational reward [12]. Kakaly et al. [13] argued that adequate pocket money can help support students' learning success by meeting daily school-related needs such as transportation and meals, thereby allowing students to focus more effectively on learning. Moreover, pocket money may positively influence students' psychological well-being and motivation, particularly in challenging subjects such as mathematics.

Despite its potential benefits, the provision and management of pocket money require careful consideration. Some students are able to manage their allowances responsibly due to effective parental guidance, while others may misuse pocket money for non-educational purposes [14]. Parents play a central role in controlling economic resources and guiding children's spending behavior [15]. Adequate and well-managed pocket money can support students' learning motivation and academic performance, whereas insufficient or poorly managed allowances may limit these benefits. Although previous studies have examined the relationship between pocket money, motivation, and academic achievement, few have specifically focused on mathematics learning outcomes among elementary school students. Given that mathematics is often perceived as difficult and requires additional motivation and support [16], this study seeks to address this gap by examining the relationship between pocket money provision and mathematics learning outcomes at the elementary school level. The findings are expected to provide valuable insights into the role of financial support in enhancing mathematics learning in primary education.

2. LITERATURE REVIEW

2.1. Pocket Money

Pocket money has been widely discussed in educational and socioeconomic research as an important form of parental financial support that contributes to children's daily functioning and learning readiness. Defined as a regular amount of money provided by parents to children to meet basic personal and school-related needs, pocket money serves not only as economic assistance but also as a means of socialization into financial responsibility [12]. Previous studies have emphasized that pocket money allows children to manage minor expenses independently, such as transportation, meals, and learning materials, which can reduce stress and distractions during school hours. When basic needs are met, students are more likely to feel secure and focused, creating conditions that are conducive to learning. In this context, pocket money functions as an

indirect facilitator of academic engagement by supporting students' physical comfort and emotional well-being at school.

In addition to its practical function, pocket money has been examined as a motivational factor in children's learning behavior. Several studies suggest that pocket money can act as an extrinsic reward that reinforces positive academic behaviors, such as regular attendance, task completion, and persistence in challenging subjects. Palupi et al. [17] noted that children who regularly receive pocket money tend to demonstrate greater economic competence and self-regulation, which are skills closely related to academic success. However, the impact of pocket money on learning is not uniform and largely depends on parental guidance and monitoring. Without appropriate supervision, pocket money may be used for non-educational purposes, potentially diminishing its positive effects on learning.

2.2. Learning Outcomes

Learning outcomes are commonly defined as measurable indicators of students' knowledge, skills, attitudes, and competencies acquired through the learning process. In educational research, learning outcomes serve as a primary benchmark for evaluating the effectiveness of instructional strategies, curriculum design, and learning environments [18]. At the elementary school level, learning outcomes are particularly important because they reflect the foundational competencies that influence students' future academic trajectories. Researchers have consistently emphasized that learning outcomes are shaped by a complex interaction of cognitive, affective, and contextual factors, including motivation, learning resources, teacher quality, and family support. As such, learning outcomes should be understood not merely as test scores, but as multidimensional representations of students' academic development [19].

Motivation has been identified as one of the strongest predictors of learning outcomes across educational levels. Studies have shown that students with higher learning motivation tend to demonstrate better academic performance, stronger persistence, and deeper engagement with learning tasks [20]. External factors, including parental involvement and financial support, also play a significant role in shaping learning outcomes, particularly for younger learners who remain highly dependent on their families. In elementary education, supportive home environments that provide adequate learning resources and emotional encouragement are closely associated with improved academic achievement [21], [22]. Consequently, financial support mechanisms such as pocket money may indirectly influence learning outcomes by enhancing students' motivation, readiness to learn, and ability to concentrate during instructional activities.

2.3. Mathematics

Mathematics is widely regarded as a core subject in elementary education due to its role in developing logical reasoning, problem-solving abilities, and numeracy skills essential for everyday life. However, mathematics is also frequently perceived as one of the most challenging subjects for young learners. Mu'minah & Suryaningsih [23] describe mathematics as a discipline involving abstract concepts, numerical operations, patterns, and logical structures, which often require higher levels of cognitive effort compared to other subjects. As a result, many elementary school students experience difficulties in understanding mathematical concepts, leading to low confidence and negative attitudes toward the subject [24], [25]. These challenges highlight the importance of creating supportive learning environments that can reduce anxiety and foster positive mathematical experiences.

Research has consistently shown that students' emotional and motivational states significantly influence their performance in mathematics. Mathematics anxiety, in particular, has been linked to reduced concentration, avoidance behaviors, and lower academic achievement [26], [27]. To address these challenges, scholars emphasize the need for both instructional and non-instructional support systems that encourage student engagement and confidence. External support, including encouragement from parents and the provision of basic learning needs, can help mitigate negative perceptions of mathematics [28], [29]. In this regard, pocket money may play a supporting role by ensuring that students' basic needs are met and by serving as a motivational incentive, thereby enabling students to approach mathematics learning with greater focus and persistence.

2.4. Elementary School

Elementary school represents a critical stage in children's cognitive, emotional, and social development, as it lays the foundation for lifelong learning. During this period, students develop essential academic skills, learning habits, and attitudes toward education [30]. Elementary school students are generally more

dependent on external support from teachers and parents, particularly in managing learning routines and meeting school-related needs. Family involvement has been identified as a key factor in promoting positive learning behaviors and academic success at this level [31]. Supportive parental practices, including financial support and guidance, contribute to creating a stable learning environment that fosters students' motivation and engagement.

From a socioeconomic perspective, disparities in family resources can significantly affect students' learning experiences in elementary school. Children from families with limited financial resources may face challenges in accessing basic learning materials, transportation, and nutrition, all of which are essential for effective learning. Suyatno et al. [32] and Rambe et al. [33] emphasized that family socioeconomic status influences children's academic achievement through the availability of resources and the quality of the learning environment at home. In this context, pocket money can be viewed as a micro-level financial intervention that helps address students' immediate needs and supports their daily participation in school activities. When provided appropriately and accompanied by parental guidance, pocket money has the potential to contribute positively to elementary school students' learning outcomes, particularly in demanding subjects such as mathematics.

3. METHOD

This study employed a quantitative research approach using a survey design to examine the relationship between pocket money and mathematics learning outcomes among elementary school students. While learning motivation is theorized as a potential mediator, this study focused on examining the direct relationship between pocket money and mathematics scores. Quantitative methods are appropriate for studies that aim to measure relationships between variables using numerical data and statistical analysis [34]. The participants of this study consisted of 17 sixth-grade students from Karangtengah 2 Elementary School, who were selected using a total sampling technique, as the population size was relatively small. The small sample size limits the statistical power and the generalizability of the findings but was deemed appropriate for this exploratory study within a single school context. Data were collected through a structured questionnaire designed to obtain information on students' weekly pocket money, as well as documentation of students' mathematics scores obtained from school records. The use of questionnaires and documentation is commonly recommended in educational research to capture both self-reported data and objective academic performance indicators [35].

Prior to inferential analysis, the data were subjected to a normality test using the Shapiro–Wilk test, which is recommended for small sample sizes ($n < 50$) due to its high statistical power. The test results indicated that the dependent variable (mathematics learning outcomes) was normally distributed ($p = 0.635 > 0.05$), thus meeting the assumption required for parametric analysis. Subsequently, a simple linear regression analysis was conducted to examine the effect of pocket money on students' mathematics scores. Regression analysis is widely used to determine the extent to which an independent variable predicts a dependent variable [36]. The analysis produced regression coefficients, significance values, and model fit indices, including the R-squared value, which reflects the proportion of variance in mathematics learning outcomes explained by pocket money. All statistical analyses were conducted using a standard statistical software package, with a significance level set at 0.05, in accordance with conventional practices in educational research [37].

4. RESULTS

The study began by administering questionnaires to 17 sixth-grade students at Karangtengah 2 Elementary School. In addition to administering the questionnaires, the researchers also collected data on their math scores. The initial data obtained are as follows.



Figure 1. Percentage of Pocket Money

Based on the questionnaire results, the percentage of weekly pocket money is as shown in the figure. The Rp. 20,000.00 pocket money received a percentage of 23%, representing 4 students. The Rp. 30,000.00 pocket money received a percentage of 71%, representing 12 students. And the Rp. 50,000.00 pocket money received a percentage of 6%, representing 1 student.

Table 1. Student Learning Outcomes

Statistical Measure	Result	Definition/Calculation
Mean (Average)	77.29	Total of all scores divided by the number of students
Median	76	The middle value in the sorted list (the 9th student)
Mode	76	The most frequent score (appears 4 times)
Standard Deviation	7.53	Measures the amount of variation or dispersion of the scores
Highest Score	90	Achieved by student: SAZ
Lowest Score	65	Achieved by students: DY and RAAH

Based on the analysis of mathematics score data at Karangtengah 2 Elementary School, it can be concluded that the overall academic performance of students is positive because the average class score (77.29) has exceeded the KKM (70), with a completion rate of 82% (14 out of 17 students). The same median and mode values at 76 indicate a stable concentration of scores above the minimum limit, although the standard deviation of 7.53 reflects a fairly significant range of differences in ability between the highest (90) and lowest (65) scores. This means that the average pocket money of 17 students is Rp. 28,000.00 per week. After that, the data was tested for normality with the following results.

Table 2. Normality Test Results

Normality Test (Shapiro-Wilk)	
Statistic	p
0.960	0.635

Based on the prerequisite analysis presented in Table 2, the Shapiro–Wilk normality test for the dependent variable yielded a significance value of 0.635, which exceeds the threshold of 0.05. This result indicates that the distribution of the dependent variable does not significantly deviate from a normal distribution. In accordance with the commonly accepted criterion for data normality, where a p-value greater than 0.05 suggests normality, the dependent variable can therefore be considered normally distributed. As a result, the assumption of normality required for further parametric statistical analysis is satisfactorily met. Having fulfilled this prerequisite, the data were subsequently subjected to regression analysis, the results of which are presented as follows.

Table 3. Model Coefficients

Model Coefficients – Value				
Predictor	Estimate	SE	T	p
Intercept	72.92	8.15	8.948	<.001
Pocket Money	1.42	2.75	0.515	0.614

Table 3 presents the results of the regression analysis. The p-value for the *pocket money* variable is 0.614, which is greater than the significance level of 0.05. This result indicates that the *pocket money* variable does not have a statistically significant effect on students' mathematics scores. In other words, the amount of pocket money does not show a significant relationship with mathematics achievement among sixth-grade students at SD Karangtengah 2. The table also shows that the estimated coefficient for the *pocket money* variable is 1.42, indicating that a one-unit increase in pocket money is estimated to increase mathematics scores by 1.42 points. However, this increase is not statistically significant.

Table 4. Model Fit Measures

Model Fit Measures		
Model	R	R ²
1	0.132	0.0174

Based on the table above, the R-squared value is 0.0174, indicating that pocket money explains 1.74% of the variance in students' mathematics learning outcomes, while the remaining 98.26% is influenced by other variables that were not examined in this study.

The Correlation Between Pocket Money and Mathematics Learning Outcomes: A Quantitative Study Of Sixth-Grade Students (Handika Suryatama)

5. DISCUSSION

The findings of this study provide an initial overview of the distribution of pocket money and mathematics learning outcomes among sixth-grade students at SD Karangtengah 2. The descriptive analysis indicates that the majority of students (71%) received a weekly pocket money allowance of Rp. 30,000, while smaller proportions received Rp. 20,000 (23%) and Rp. 50,000 (6%). This distribution suggests a relatively homogeneous economic support pattern among students, with most receiving allowances within a similar range. Such homogeneity may partly explain the limited variability in mathematics achievement observed in this study. Previous research has noted that when financial support levels among students are relatively uniform, the direct effect of pocket money on academic outcomes tends to be less pronounced [38], [39].

The analysis of students' mathematics learning outcomes revealed generally positive academic performance, as reflected in the mean score of 77.29, which exceeded the minimum mastery criterion (KKM) of 70. The median and mode values, both at 76, indicate a stable clustering of scores slightly above the minimum standard, suggesting that most students achieved an adequate level of mathematical understanding. However, the standard deviation of 7.53 indicates noticeable variability in student performance, with scores ranging from 65 to 90. This variation implies that while overall achievement is satisfactory, individual differences in mathematical ability remain significant. These findings are consistent with earlier studies emphasizing that mathematics achievement at the elementary level is influenced by multiple interacting factors, including cognitive ability, learning motivation, instructional quality, and family support [40], [41].

Before conducting inferential analysis, the normality assumption was tested using the Shapiro–Wilk test, which yielded a p-value of 0.635. This result confirms that the mathematics score data were normally distributed and suitable for parametric analysis. The fulfillment of this assumption strengthens the validity of the subsequent regression analysis and ensures that the statistical conclusions drawn are methodologically sound. Similar methodological rigor has been emphasized in quantitative educational studies, which highlight the importance of meeting statistical assumptions to avoid biased or misleading results [42], [43]. By satisfying the normality requirement, this study provides a reliable basis for examining the relationship between pocket money and mathematics learning outcomes.

The regression analysis results indicate that pocket money does not have a statistically significant effect on students' mathematics scores, as evidenced by a p-value of 0.614. Although the regression coefficient suggests that an increase in pocket money is associated with a modest increase in mathematics scores (estimate = 1.42), this relationship is not statistically meaningful. This finding suggests that pocket money alone is not a strong predictor of mathematics achievement among elementary school students in this context. This result aligns with previous studies that found weak or non-significant direct relationships between financial allowances and academic performance, particularly when other influential variables are not controlled [44], [45], [46].

The model fit analysis further supports this conclusion, as indicated by the R-squared value of 0.0174. This value shows that pocket money accounts for only 1.74% of the variance in students' mathematics learning outcomes, while the remaining 98.26% is explained by other unexamined factors. Such a low explanatory power suggests that mathematics achievement is predominantly influenced by variables beyond pocket money, such as learning motivation, teaching strategies, parental involvement, and students' emotional states. This finding is consistent with Ali & Hafeez [47], Holm [48] and Shirawia et al. [49], who emphasized that family financial resources alone are insufficient to explain academic achievement without considering broader socioeconomic and educational contexts.

Despite the lack of a significant effect on mathematics scores, the positive direction of the regression coefficient suggests that pocket money may still play an indirect role in supporting students' learning. Previous studies have argued that pocket money can function as a motivational tool or as practical support that helps students meet basic school-related needs, such as transportation and meals, thereby enabling them to focus better during lessons [50], [51], [52]. Moreover, Kristianto & Gandajaya [53] highlighted that learning motivation has a substantial impact on academic outcomes, suggesting that pocket money may influence achievement indirectly through motivational pathways rather than through a direct effect on test scores.

Furthermore, research on mathematics learning consistently highlights the role of affective factors, such as anxiety and self-confidence, in shaping student performance. Capinding [54] and Zanabazar & Deleg [55]

found that mathematics anxiety can significantly hinder concentration and reduce achievement, particularly among younger learners. In this context, pocket money may contribute to students' psychological comfort by reducing stress related to unmet basic needs, which in turn may support a more positive learning experience. However, without structured parental guidance and integration with broader learning support strategies, the impact of pocket money on academic achievement is likely to remain limited.

Overall, the findings of this study reinforce the view that pocket money is not a primary determinant of mathematics learning outcomes at the elementary school level but may serve as a complementary factor within a broader ecosystem of educational support. The results support earlier research indicating that academic achievement, particularly in mathematics, is shaped by a complex interplay of cognitive, motivational, instructional, and environmental factors [56], [57]. Therefore, efforts to improve mathematics achievement should focus not only on financial support but also on enhancing instructional quality, fostering learning motivation, reducing mathematics anxiety, and strengthening parental involvement. This study contributes to the existing literature by providing empirical evidence from the elementary school context and highlighting the limited yet potentially supportive role of pocket money in students' mathematics learning outcomes.

6. CONCLUSION

This study concludes that pocket money does not have a statistically significant effect on mathematics learning outcomes among sixth-grade students at SD Karangtengah 2, as indicated by the regression analysis and the low R-squared value, which shows that pocket money explains only a small proportion of the variance in students' mathematics scores. Although the relationship between pocket money and mathematics achievement is positive, its influence is relatively weak compared to other factors such as learning motivation, instructional quality, parental involvement, and students' emotional conditions. Therefore, it is recommended that parents provide pocket money in a balanced and age-appropriate manner, accompanied by proper guidance to support students' learning needs rather than as a primary means of improving academic achievement. Schools and educators are encouraged to focus on strengthening instructional strategies, fostering students' motivation, and creating supportive learning environments, while future research should involve larger samples and incorporate additional variables to obtain a more comprehensive understanding of the factors influencing mathematics learning outcomes at the elementary school level.

REFERENCES

- [1] OECD, *PISA 2012 results: What students know and can do (Vol. I)*. OECD Publishing, 2013. doi: 10.1787/9789264201118-en.
- [2] OECD, *PISA 2015 results: Excellence and equity in education (Vol. I)*. OECD Publishing, 2018.
- [3] OECD, "Results from PISA 2022: Indonesia," *OECD Publishing*, 2023.
- [4] E. Filahanasari, "Ability of strategic competence of mathematical proficiency in completing open ended mathematical questions," *International Journal of Technology Vocational Education and Training*, vol. 1, no. 1, pp. 91–96, 2020.
- [5] D. H. Siswanto, Kintoko, M. M. E. Susetyawati, and M. Y. Rambe, "Psychological determinants of mathematics achievement: Examining the roles of self-confidence, academic resilience, and learning discipline," *Jurnal Ilmiah Multidisiplin Ilmu*, vol. 2, no. 5, pp. 29–39, 2025, doi: 10.69714/grxtz057.
- [6] S. Jablonski and M. Ludwig, "Examples and generalizations in mathematical reasoning - A study with potentially mathematically gifted children," *Journal on Mathematics Education*, vol. 13, no. 4, pp. 605–630, 2022, doi: 10.22342/jme.v13i4.pp605-630.
- [7] A. Loukomies *et al.*, "Promoting Students' Interest and Motivation Towards Science Learning: The Role of Personal Needs and Motivation Orientations," *Res. Sci. Educ.*, vol. 43, no. 6, pp. 2517–2539, 2013, doi: 10.1007/s11165-013-9370-1.
- [8] R. Isnaeni Mutik, K. Kartono, and I. Kharisudin, "Numeracy literacy skills in the ELPSA learning model with the Realistic Mathematics Education approach viewed from students' mathematics anxiety," *Indonesian Journal of Mathematics Education*, vol. 7, no. 2, pp. 71–81, 2024.
- [9] T. Karakose *et al.*, "Assessment of the Relationships between Prospective Mathematics Teachers' Classroom Management Anxiety, Academic Self-Efficacy Beliefs, Academic Amotivation and Attitudes toward the Teaching Profession Using Structural Equation Modelling," *Mathematics*, vol. 11, no. 2, pp. 1–23, 2023, doi: 10.3390/math11020449.

- [10] H. A. Putri and D. H. Siswanto, "Teaching at The Right Level (TaRL) as an implementation of new education concepts in the insights of Ki Hajar Dewantara," *Indonesian Journal of Educational Science and Technology (Nurture)*, vol. 3, no. 2, pp. 89–100, 2024, doi: 10.55927/nurture.v3i2.9297.
- [11] C. Vásquez, J. L. Piñeiro, and I. García-Alonso, "What Challenges Does the 21st Century Impose on the Knowledge of Primary School Teachers Who Teach Mathematics? An Analysis from a Latin American Perspective," *Mathematics*, vol. 10, no. 3, 2022, doi: 10.3390/math10030391.
- [12] T. Ulfatun and B. D. Atmojo, *Economic Literacy and Pocket Money Predict Students' Interest to Make an Investment*, no. March. Atlantis Press SARL, 2022. doi: 10.2991/978-2-494069-71-8.
- [13] S. Kakaly, N. Sintesa, R. Bakti, and T. Afriliansyah, "The Effect of Learning Motivation on Learning Achievement with Pocket Money as a Moderating Variable," *Riwayat: Educational Journal of History and Humanities*, vol. 6, no. 3, pp. 1468–1473, 2023.
- [14] Y. Cui, E. L. Forget, Y. Zhu, M. Torabi, and U. Oguzoglu, "The effects of cigarette price and the amount of pocket money on youth smoking initiation and intensity in Canada," *Canadian Journal of Public Health*, vol. 110, no. 1, pp. 93–102, 2019, doi: 10.17269/s41997-018-0123-9.
- [15] N. Wahyuni, E. K. Alghiffari, D. H. Siswanto, and A. Setiawan, "Workshop Parenting Berbasis Keluarga untuk Mengoptimalkan Pengasuhan Siswa Sekolah Menengah Atas," *Jurnal Solusi Masyarakat Dikara*, vol. 5, no. 1, pp. 1–6, 2025.
- [16] F. Toader, "The Discursive Construction of 'Good Parenting' by Romanian Parenting Influencers," *Romanian Journal of Communication and Public Relations*, vol. 25, no. 2, pp. 23–48, 2023, doi: 10.21018/rjcp.2023.2.399.
- [17] R. R. Palupi, H. Wahyono, and L. W. Wardana, "The Influence of Financial Literacy, Amount of Pocket Money, and Life Style on Student Consumption Behavior STKIP PGRI Nganjuk Economics Education," *IJEBD (International Journal of Entrepreneurship and Business Development)*, vol. 6, no. 2, pp. 333–344, 2023.
- [18] R. C. Welerubun, H. L. Wambrauw, J. Jeni, D. Wolo, and I. Damopolii, "Contextual Teaching and Learning in Learning Environmental Pollution: the Effect on Student Learning Outcomes," *Prima Magistra: Jurnal Ilmiah Kependidikan*, vol. 3, no. 1, pp. 106–115, 2022, doi: 10.37478/jpm.v3i1.1487.
- [19] I. Supena, A. Darmuki, and A. Hariyadi, "The influence of 4C (constructive, critical, creativity, collaborative) learning model on students' learning outcomes," *International Journal of Instruction*, vol. 14, no. 3, pp. 873–892, 2021, doi: 10.29333/iji.2021.14351a.
- [20] H. F. Apriwulan, A. Hanama, S. A. Pisiwati, and D. H. Siswanto, "Library service management as an effort to cultivate students' reading interest in improving activities and learning outcomes," *Curricula: Journal of Curriculum Development*, vol. 4, no. 1, pp. 199–214, 2025, doi: 10.17509/curricula.v4i1.76911.
- [21] C. T. Astuti, S. Leovanny, L. Aulia, N. Z. Caesaria, and D. H. Siswanto, "Learning Approaches, Climate, Motivation, Soft Skills, and Achievement: A Comparative Study of Nature-Based and Conventional Educational Systems," *JPIM: Jurnal Penelitian Ilmiah Multidisiplin*, vol. 02, no. 04, pp. 1832–1845, 2025.
- [22] A. Novantoro, Nur. Janah, and D. H. Siswanto, "Peningkatkan kemampuan penalaran induktif matematika dengan model group investigation," *Papanda Journal of Mathematics and Science Research*, vol. 4, no. 1, pp. 67–76, 2025.
- [23] I. H. Mu'minah and Y. Suryaningsih, "Implementasi Steam (Science, Technology, Engineering, Arts, and Mathematics) dalam Pembelajaran Abad 21," *Jurnal Bio Education*, vol. 5, no. 1, pp. 65–73, 2020.
- [24] S. Rochmat, Andriyani, and D. H. Siswanto, "Developing an RME-based 3D storybook with AR technology to enhance spatial ability," *Bulletin of Applied Mathematics and Mathematics Education*, vol. 5, no. 1, pp. 9–22, 2025, doi: 10.12928/bamme.v5i1.10880.
- [25] M. Limori, D. H. Siswanto, T. Shigematsu, and W. Astiwi, "Integrating STEAM in Teaching Integrals: An Interactive Media Needs Analysis to Enhance Creative Thinking," *RUKASI: Jurnal Ilmiah Perkembangan Penedidikan dan Pembelajaran*, vol. 02, no. 05, 2025.
- [26] J. Radišić, N. Buchholtz, K. Yang-Hansen, X. Liu, and H. Kaarstein, "Do teachers' beliefs about the nature and learning of mathematics affect students' motivation and enjoyment of mathematics? Examining differences between boys and girls across six countries," *European Journal of Psychology of Education*, vol. 39, no. 2, pp. 1587–1613, 2024, doi: 10.1007/s10212-024-00809-6.
- [27] B. Barton, *Cultural Mathematics: Connecting Indigenous Knowledge and Mathematical Thinking*. Springer, 2020.

- [28] M. M. A. Maba, D. H. Siswanto, and N. Z. Caesaria, "Ethnomathematical exploration of the Apem Wonolelo tradition in Sleman Regency," *Jurnal Padamu Negeri*, vol. 2, no. 4, pp. 161–171, Nov. 2025, doi: 10.69714/x4xp7f07.
- [29] A. K. Khasanah, Wiryanto, and T. Y. E. Siswono, "The effectiveness of Realistic Mathematics Education to improve student's Problem Solving skills in Elementary School's: Literature review," *Jurnal Cakrawala Pendas*, vol. 11, no. 1, pp. 188–199, 2025.
- [30] D. H. Siswanto, "Dampak Uang Saku Terhadap Keinginan Belajar Matematika Pada Murid Sekolah Dasar," *Jurnal Lingkar Mutu Pendidikan*, vol. 21, no. 1, pp. 37–46, 2024, doi: 10.54124/jlmp.v21i1.121.
- [31] S. Suyatno, W. Wantini, A. Ahmadong, K. Khosiin, and A. Samaalee, "Internalization of islamic values in muhammadiyah elementary schools," *International Journal of Educational Management and Innovation*, vol. 4, no. 1, pp. 1–13, 2023.
- [32] M. Y. Rambe, K. Tanikawa, and D. H. Siswanto, "Economics Education with Islamic Character Values: Fostering Frugality and Responsibility among High School Students," *RUKASI: Jurnal Ilmiah Perkembangan Pendidikan dan Pembelajaran*, vol. 02, no. 05, pp. 213–219, 2025.
- [33] J. W. Creswell, *Reseach design: Pendekatan kualitatif, kuantitatif, dan mixed*. Yogyakarta: Pustaka pelajar., 2014.
- [34] N. Naufal, F. Apriani, Fajriana, Nurdin, K. Nurdin, and D. H. Siswanto, *Analisis Multivariat*. Padang: Literasi Langsung Terbit, 2025.
- [35] L. F. Casinillo, "Quantile regression analysis for students' difficulty level in learning statistics online," *JPI (Jurnal Pendidikan Indonesia)*, vol. 12, no. 4, pp. 607–614, 2023, doi: 10.23887/jpiundiksha.v12i4.66752.
- [36] D. Haack, "Teaching Statistical Literacy," *Teach. Stat.*, vol. 1, no. 3, pp. 74–76, 1979, doi: doi.org/10.1111/j.1467-9639.1979.tb00741.x.
- [37] D. H. Siswanto and A. Hanama, "The influence of pocket money on the desire to learn mathematics among Elementary School students," *International Journal of Learning Reformation in Elementary Education*, vol. 3, no. 03, pp. 164–175, 2024, doi: 10.56741/ijlree.v3i03.652.
- [38] B. Tanri and M. A. E. Marlina, "Pengaruh Tingkat Ekonomi Keluarga, Uang Saku, Jenis Kelamin dan Indeks Prestasi Kumulatif terhadap Financial Literacy Mahasiswa Akuntansi," *Equilibiria*, vol. 9, no. 1, pp. 120–132, 2022.
- [39] D. H. Siswanto, Andriyani, and M. Y. Rambe, "Improving mathematics interest and achievement through contextual teaching and learning," *Journal of Professional Teacher Education*, vol. 03, no. 01, pp. 01–11, 2025, doi: 10.12928/jprotect.v3i1.799.
- [40] H. Hadijah, I. Isnarto, and W. Walid, "The effect of immediate feedback on mathematics learning achievement," *Jurnal Pijar Mipa*, vol. 17, no. 6, pp. 712–716, 2022, doi: 10.29303/jpm.v17i6.4172.
- [41] L. B. Johnson and L. Christensen, *Educational Research: Quantitative, Qualitative, and Mixed Approaches*, Fifth., vol. 4, no. 1. London: SAGE Publications, Inc, 2014. doi: 10.4324/9781351004626-12.
- [42] D. H. Siswanto, A. Hanama, and H. F. Apriwulan, "Teacher well-being and its influence on school effectiveness: A quantitative study," *Journal of Educational Research and Practice*, vol. 3, no. 2, pp. 213–224, 2025.
- [43] M. S. Sa'id, D. H. Siswanto, and Kintoko, "From ritual to reasoning: Exploring ethnomathematical concepts in the Ngawu-Awu cultural tradition," *Jurnal Padamu Negeri*, vol. 3, no. 2, pp. 01–09, 2026, doi: 10.69714/w7t8sc43.
- [44] Tarso, R. Efendi, H. U. Kasanah, A. P. Nugroho, and D. H. Siswanto, *Manajemen Pendidikan Holistik: Membangun Sekolah Unggul dan Berkarakter*. Surabaya: Yayasan Andus Edukasi Indonesia, 2026.
- [45] Y. W. Sari, M. Nugroho, and N. Rahmiyati, "The effect of financial knowledge, financial behavior and digital financial capabilities on financial inclusion, financial concern and performance in MSMEs in East Java," *Uncertain Supply Chain Management*, vol. 11, no. 4, pp. 1745–1758, 2023.
- [46] Ali and H. Hafeez, "Academic achievement: Influences of university students' self-management and perceived self-efficacy," *J. Intell.*, vol. 10, no. 55, pp. 1–18, 2022, [Online]. Available: <https://doi.org/10.3390/jintelligence10030055>
- [47] P. Holm, "Impact of digital literacy on academic achievement: Evidence from an online anatomy and physiology course," *E-Learning and Digital Media*, vol. 22, no. 2, pp. 139–155, 2024.
- [48] N. Shirawia, R. Alali, Y. Wardat, M. A. Tashtoush, S. Saleh, and M. Helali, "Logical Mathematical Intelligence and its Impact on the Academic Achievement for Pre-Service Math Teachers," *Journal*

- of Educational and Social Research*, vol. 13, no. 6, pp. 239–254, 2023, doi: 10.36941/jesr-2023-0161.
- [49] K. Kintoko, D. H. Siswanto, V. E. Siswandari, and F. Mulianingsih, *Kepemimpinan Wakil Kepala Sekolah: Manajemen, Inovasi dan Transformasi Pendidikan*. Surabaya: Yayasan Andus Edukasi Indonesia, 2025.
- [50] Tarso, D. H. Siswanto, and A. Setiawan, “Teacher qualifications in the implementation of the Kurikulum Merdeka and ISMUBA,” *Curricula: Journal of Curriculum Development*, vol. 4, no. 1, pp. 13–28, 2025.
- [51] H. U. Kasanah, E. Purwanto, A. S. Kurniawan, and D. H. Siswanto, “Balancing Academic Performance and Sports Achievement in Special Sports Class Management,” *Jurnal Padamu Negeri*, vol. 2, no. 4, pp. 118–128, 2025, doi: 10.69714/80ba7m37.
- [52] H. Kristianto and L. Gandajaya, “Offline vs Online Problem-Based Learning: a Case Study of Student Engagement and Learning Outcomes,” *Interactive Technology and Smart Education*, vol. 20, no. 1, pp. 106–121, 2023, doi: 10.1108/ITSE-09-2021-0166.
- [53] A. T. Capinding, “Impact of Modular Distance Learning on High School Students Mathematics Motivation, Interest/Attitude, Anxiety and Achievement during the COVID-19 Pandemic,” *European Journal of Educational Research*, vol. 12, no. 2, pp. 749–758, 2023.
- [54] A. Zanabazar and A. Deleg, “The Indonesian Journal of the Social Sciences The Relationship between Mathematics Anxiety and Mathematical Performance among Undergraduate Students,” *Jurnal Ilmiah Peuradeun*, vol. 11, no. 1, 2023.
- [55] Y. Yang, J. van Aalst, C. K. K. Chan, and W. Tian, “Reflective assessment in knowledge building by students with low academic achievement,” *Int. J. Comput. Support. Collab. Learn.*, vol. 11, no. 3, pp. 281–311, 2016, doi: 10.1007/s11412-016-9239-1.
- [56] R. B. King, Y. Cai, and A. J. Elliot, “Income inequality is associated with heightened test anxiety and lower academic achievement: A cross-national study in 51 countries,” *Learn. Instr.*, vol. 89, no. January 2024, 2024, doi: 10.1016/j.learninstruc.2023.101825.