

The Influence of Parents' Socioeconomic Status on Children's Mathematics Learning Outcomes

Rinda Sofian Zendrato¹, Benny Sofyan Samosir², Yulia Anita Siregar³, Kholid Umar⁴,
Ainun Mardiyah Lubis⁵

¹⁻⁵ Universitas Muhammadiyah Tapanuli Selatan, North Sumatra, Indonesia

✉ rindazend@gmail.com

Received: May 18, 2026 | **Revised:** July 18, 2026 | **Accepted:** August 9, 2026 | **Published:** August 28, 2026

ABSTRACT Low mathematics learning outcomes among children in remote rural areas remain an educational concern. This study aimed to analyze the relationship between parental socioeconomic status (SSE) and the mathematics learning outcomes of children aged 13–15 years in Aek Gambir Village, Lumut District, Central Tapanuli Regency. Parental SSE was measured using a questionnaire covering three dimensions: education level, type of employment, and family income level. Mathematics learning outcomes were measured using an essay test that had undergone expert review for content validity and was accompanied by a test blueprint and scoring rubric. This study employed a quantitative ex post facto design. The sample comprised all 30 children aged 13–15 years residing in Aek Gambir Village and was selected through total sampling, with informed consent obtained from their parents or guardians. Questionnaire validity was examined using Pearson product-moment correlations, and reliability was assessed using Cronbach's alpha ($\alpha = 0.858$). The Pearson correlation analysis yielded $r = 0.887$ ($p < .001$), while simple linear regression produced the equation $\hat{Y} = 3.631 + 0.187X$ with $R^2 = 0.786$. Thus, parental SSE accounted for 78.6% of the variance in children's mathematics learning outcomes. Because this study was correlational, the findings represent a predictive association and should not be interpreted as evidence of causality.

Keywords: socioeconomic status, mathematics learning outcomes, simple linear regression, central tapanuli

INTRODUCTION

Mathematics education plays a central role in developing the quality of human resources. However, mathematics learning outcomes among children in rural and remote areas often remain below expectations. The educational gap between urban and rural communities therefore remains a persistent challenge. One factor that may contribute to this gap is variation in students' family socioeconomic backgrounds.

Socioeconomic status reflects a family's relative social and economic position within society and is commonly associated with parental education, occupation, and income

(Fatmasari & Kurniawan, 2021). Together, these dimensions shape a family's capacity to support a child's learning. Children from families with higher SSE tend to have greater access to books, tutoring, and intellectual stimulation, whereas children from families with lower SSE often face limitations in these resources (Ummah et al., 2025). Greater socioeconomic resources may provide access to private tutoring, learning materials, and technology. Conversely, financial instability may create stress that interferes with students' concentration and learning (Natasya et al., 2025).

The influence of SSE on children's learning outcomes can be explained through two complementary theoretical mechanisms. First, the family investment model explains that families with greater economic resources are able to invest in their children's learning capital, for example through books, teaching materials, additional tutoring, and a home environment that supports learning concentration. Second, the family stress model explains that economic limitations can cause psychological stress in parents, which in turn reduces the quality of parenting, communication, and support for children's learning at home (Conger & Donnellan, 2007). These two mechanisms—access to material resources and quality of parenting—are thought to operate simultaneously in rural contexts such as Aek Gambir Village, making them important considerations in interpreting the findings of this study.

Parents strongly influence the development of their children's personalities, and parent-child communication can affect children's present and future development. Alongside family factors, the school environment and the surrounding community also play important roles in children's learning processes (Sudirman & Wisnawati Budi, 2024).

Aek Gambir Village, Lumut District, Central Tapanuli Regency, is a rural area where the majority of the population relies on agriculture and trade for their livelihoods. Initial observations in February 2026 indicated that the majority of junior high school-aged children in the village did not attend formal junior high schools. This is suspected to be related to parents' economic constraints, which affect their ability to provide adequate learning facilities and resources.

Previous studies have examined the relationship between parental SSE and student learning outcomes in both national and international contexts. A meta-analysis of 74 independent samples found a moderate relationship between SSE and academic achievement, although its magnitude varied by school level and study location (Sirin, 2005). In Indonesia, Fatmasari and Kurniawan (2021) reported that parental socioeconomic status and learning motivation significantly predicted student learning outcomes. A literature review by Fahrurrozi et al. (2022) similarly identified parental education, employment, and income as relevant to elementary students' learning outcomes. However, Supit and Gosal (2023) found no significant relationship between parental socioeconomic status and student achievement, indicating that the association may vary across

contexts. A systematic review of 20 studies nevertheless found that SSE was consistently related to learning outcomes and academic disparities (Rohmah et al., 2025).

Learning outcomes may also be influenced by external factors such as the family environment, learning motivation, and peer support. More favorable family economic conditions can increase access to learning resources and academic guidance, which may support achievement (Wijaya et al., 2025). Parental socioeconomic conditions may also be related to students' learning motivation (Husna et al., 2026). In addition, internal factors such as self-confidence and interest in mathematics may influence learning outcomes (Amanda et al., 2024), while learning facilities at home, including a study space, desk, chair, and stationery, may further support the learning process (Sitohang et al., 2023).

Research specifically examining the relationship between parental SSE and mathematics learning outcomes among junior high school-aged children in remote rural areas of Central Tapanuli Regency remains limited. This gap is geographical, conceptual, and methodological. Conceptually, many previous studies have measured SSE using a single indicator, such as income, rather than integrating education, employment, and income within one instrument. Methodologically, some studies have not reported adequate evidence of the content validity of their learning-outcome measures, making the reliability of their findings difficult to assess. This study addresses these gaps by using a tested multidimensional SSE instrument and a mathematics learning-outcome test supported by evidence of content validity within the distinct geographical, social, and economic context of Aek Gambir. Accordingly, this study aimed to: (1) describe parental SSE and children's mathematics learning outcomes in Aek Gambir Village; (2) analyze their relationship using Pearson correlation; and (3) estimate the predictive contribution of parental SSE to mathematics learning outcomes using simple linear regression.

RESEARCH METHODS

A. Research Design, Population, Participants, and Ethics

This study employed a quantitative ex post facto design because the independent variable, parental SSE, was a naturally occurring condition and was not manipulated by the researchers. The quantitative approach was selected to measure the association between variables objectively (Sugiyono, 2022; Creswell & Creswell, 2023).

The study population comprised all children aged 13–15 years residing in Aek Gambir Village, Lumut District, Central Tapanuli Regency, including those who were and were not enrolled in formal schooling at the time of the study. Village population data updated in February 2026 identified 30 eligible children; therefore, all members of the population were included through total sampling. Participants had varied schooling status:

some attended formal junior high schools, while others attended an equivalent Package B program. All participants completed the same mathematics learning-outcome test because the assessed content referred to general competencies for Grades VII–IX rather than the learning outcomes of a specific school curriculum.

Informed consent was obtained from parents or guardians before data collection. They received an explanation of the study's purpose, the participants' right to refuse or withdraw without consequences, and the confidentiality of the children's and families' identities. Because the participants were children and therefore considered a vulnerable population, data collection was conducted at their homes in the presence of a parent or guardian.

B. Research Instruments

Two types of instruments were used. First, the parental SSE questionnaire comprised 20 statements rated on a four-point Likert scale (1 = Never, 2 = Sometimes, 3 = Often, and 4 = Always). It covered education level (7 items), type of employment (6 items), and family income level (7 items), producing a total score ranging from 20 to 80. The researchers recognized that a Never–Always frequency scale is primarily intended to measure behaviors or habits, whereas education, employment, and income are factual or categorical characteristics. To address this limitation, the items were framed as statements about the frequency of behaviors or conditions reflecting each dimension. Examples included “My parents read or search for information to support my learning” for education, “My parents have jobs with regular income” for employment, and “My family is able to meet the needs of learning tools without significant difficulty” for income. This operationalization remains a limitation; therefore, future studies should supplement the scale with factual data, such as the highest level of education completed and nominal household income, for triangulation.

Second, the mathematics learning-outcome test comprised five essay questions, each scored from 0 to 4, covering algebraic operations, ratios, and plane geometry based on basic mathematics competencies for Grades VII–IX. The total score ranged from 0 to 20. The test blueprint mapped these competencies to achievement indicators, with each question representing one indicator. An analytical rubric assigned 0 points to a blank or entirely incorrect answer, 1–2 points to a partially correct solution process, 3 points to a correct process with an inaccurate final result, and 4 points to a correct and complete answer. A mathematics education expert reviewed the instrument's content validity to assess the alignment of the questions with the achievement indicators and students' cognitive levels. The instrument was then pilot-tested on a limited basis before being administered to the study sample.

C. Questionnaire Validity and Reliability Testing

Questionnaire validity was examined in SPSS using Pearson product-moment correlations. The calculated r value for each item was compared with the critical value ($df = n - 2 = 28$; $\alpha = .05$; critical $r = .361$). An item was considered valid when its calculated r exceeded the critical value. All 20 items were valid, with calculated r values ranging from .382 to .749. Reliability was assessed using Cronbach's alpha, which yielded a coefficient of .858 and indicated very high reliability (Arikunto, 2021). The item-validity results are presented in Table 1.

Table 1. Validity Test Results for the Parental SSE Questionnaire

Indicators	Number of Items	Calculated r Range
Education Level (X_1)	7	.382--.749
Type of Employment (X_2)	6	.401--.681
Income Level (X_3)	7	.419--.712
Total	20	.382--.749

D. Data Analysis Techniques

Data were analyzed in SPSS through five stages. First, descriptive statistics were calculated, including the mean, standard deviation, minimum, and maximum for both variables. Second, the Kolmogorov–Smirnov test was used to assess normality ($p > .05$). Third, linearity was assessed using the Test for Linearity ($p < .05$ for Linearity and $p > .05$ for Deviation from Linearity). Fourth, Pearson product-moment correlation was used to determine the strength and direction of the relationship between parental SSE (X) and mathematics learning outcomes (Y). Fifth, simple linear regression was used to estimate the predictive contribution of parental SSE to children's mathematics learning outcomes using the equation $\hat{Y} = a + bX$. Because the ex post facto design was non-experimental and correlational, the regression analysis represented a predictive association rather than an experimentally established causal effect.

RESULTS AND DISCUSSION

A. Statistical Description of Variables

Among the 30 junior high school-aged participants in Aek Gambir Village, 60% had parents whose highest education was elementary school or equivalent, 43.3% had parents who worked as farmers or traders, and 56.7% came from families earning less than Rp1,500,000 per month. Table 2 presents the descriptive statistics for the two main study variables.

Table 2. Descriptive Statistics of Research Variables

	N	Min	Max	Mean	Std. Deviation
Parental SSE (X)	30	27	77	52.17	13.173
Mathematics Learning Outcomes (Y)	30	5	19	13.37	2.773

Table 2 shows that parents' SSE scores ranged from 27 to 77 (out of a theoretical range of 20–80) with a mean of 52.17 and a standard deviation of 13.173. Children's mathematics learning outcome scores ranged from 5 to 19 (out of a theoretical range of 0–20) with a mean of 13.37 (equivalent to 66.86 on a 100-point scale) and a standard deviation of 2.773.

B. Prerequisite Analysis Tests

The Kolmogorov–Smirnov test yielded two-tailed significance values of .147 for X and .163 for Y, both exceeding .05 and indicating that the data were normally distributed. The linearity test yielded $p < .001$ for Linearity and $p = .391$ for Deviation from Linearity, supporting a linear relationship between the variables.

C. Pearson Product Moment Correlation Test

The Pearson product-moment correlation results are presented in Table 3.

Table 3. Pearson Product Moment Correlation Test Results

	Parental SSE (X)	Mathematics Learning Outcomes (Y)
Pearson Correlation (X)	1	.887**
Sig. (2-tailed) (X)	--	< .001
N	30	30
Pearson Correlation (Y)	.887**	1
Sig. (2-tailed) (Y)	< .001	--

**. Significant correlation at the 0.01 level (2-tailed).

The correlation between parental SSE and children's mathematics learning outcomes was positive and statistically significant, $r = .887$, $p < .001$. According to the criteria proposed by Sugiyono (2022), this coefficient represents a strong relationship.

D. Simple Linear Regression Analysis

The results of the simple linear regression analysis are presented in Table 4 (Model Summary), Table 5 (ANOVA), and Table 6 (Coefficients).

Table 4. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.887 ^a	.786	.778	1.305

a. Predictors: (Constant), Parental SSE (X)

Table 5. ANOVA Test Results

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	175.279	1	175.279	102.916	< .001 ^b
Residual	47.687	28	1.703	--	--
Total	222.967	29	--	--	--

b. Predictors: (Constant), Parental SSE (X); Dependent Variable: Mathematics Learning Outcomes (Y).

Table 6. Regression Coefficients

Model	B	Std. Error	Beta (β)	t	Sig.
1 (Constant)	3.631	.989	--	3.672	.001
Parental SSE	.187	.018	.887	10.145	< .001

a. Dependent Variable: Mathematics Learning Outcomes (Y).

Based on Tables 4–6, the simple linear regression equation was $\hat{Y} = 3.631 + 0.187X$. The model explained 78.6% of the variance in mathematics learning outcomes ($R^2 = .786$) and was statistically significant, $F(1, 28) = 102.916$, $p < .001$. The parental SSE coefficient was also statistically significant, $t = 10.145$, $p < .001$.

The findings indicate that parental SSE was strongly and positively associated with the mathematics learning outcomes of junior high school-aged children in Aek Gambir Village. The proportion of explained variance was substantial for a single-predictor model, suggesting that SSE plays an important predictive role in this remote rural context. Consistent with the family investment model described in the Introduction, this relationship may operate partly through access to learning resources. Families earning less than Rp1,500,000 per month may have difficulty providing mathematics books, adequate stationery, or internet access, thereby limiting opportunities for independent study at home. This interpretation is consistent with an Indonesian literature review on SSE and student learning outcomes (Fahrurrozi et al., 2022) and an international meta-analysis

showing a moderate association between SSE and academic achievement across contexts (Sirin, 2005).

The Central Statistics Agency (BPS) (2023) documented socioeconomic and educational conditions in Central Tapanuli, providing contextual support for the material constraints identified in this study. Research in disadvantaged private schools in Depok further showed that growth mindset and delayed gratification were associated with learning outcomes, illustrating how psychosocial factors may interact with socioeconomic disadvantage (Rahardi & Dartanto, 2021).

In addition to material resources, the psychosocial pathway described by the family stress model may also be relevant. Many parents in Aek Gambir Village work as farmers or traders, occupations characterized by irregular schedules, uncertain income, and physical demands. These conditions may limit the time and energy available for supporting children's learning at home. However, this interpretation should remain cautious because the present study did not directly measure parental support time or psychological distress. Moreover, Supit and Gosal (2023) reported no significant relationship between parental economic status and student achievement in a different setting, reinforcing the possibility that contextual and psychosocial factors shape the association.

The remaining 21.4% of unexplained variance indicates that SSE was not the only factor associated with mathematics learning outcomes. Other possible contributors include intrinsic motivation, peer support, confidence in mathematics (Amanda et al., 2024), and the quality of non-formal learning opportunities in rural settings. Khasanah et al. (2025) similarly emphasized that students from lower socioeconomic backgrounds may still achieve positive outcomes when supported by a favorable learning environment. Educational interventions should therefore address both material constraints and the broader learning environment.

These findings have practical implications for local education stakeholders. The Central Tapanuli Regency government may consider educational subsidies, village-library development, and shared learning facilities for economically disadvantaged families in remote areas (BPS, 2023). Schools and village governments may also provide academic mentoring and more equitable access to learning resources, as recommended by Rohmah et al. (2025). Village-based parenting programs may further strengthen parental awareness and involvement in children's mathematics learning. Nevertheless, because the study used a correlational design and a small sample from one village, these interventions should be evaluated through broader experimental or quasi-experimental research before large-scale implementation.

CONCLUSION AND RECOMMENDATIONS

Parental socioeconomic status was positively and significantly associated with the mathematics learning outcomes of children aged 13–15 years in Aek Gambir Village. The correlation was strong ($r = .887, p < .001$), and parental SSE explained 78.6% of the variance in learning outcomes. These results indicate that parental SSE is an important predictor of mathematics learning outcomes in the study context. However, because the research used a correlational ex post facto design, the relationship should not be interpreted as causal.

The study was limited by its small sample of 30 participants from one village, the use of a frequency-based SSE scale without supporting factual data, and a single-predictor regression model that did not include potential mediators or moderators. Future studies should involve participants from several villages or districts, triangulate SSE scores with factual information on education, occupation, and income, and examine additional variables such as learning motivation, parental involvement, peer support, and learning-assistance time. Mixed-methods and quasi-experimental designs are also recommended to clarify the mechanisms underlying the relationship and evaluate the effectiveness of educational support programs. At the practical level, schools and local governments may pilot shared learning facilities, community-based academic mentoring, and parent-literacy programs for families with limited socioeconomic resources.

Artificial Intelligence Statement: The authors used Claude AI (Anthropic) solely for translation during manuscript preparation. All AI-assisted translations were reviewed and revised by the authors, who remain fully responsible for the accuracy and integrity of the final manuscript.

Author Contribution Statement: RSZ: Conceptualization, Methodology, Software, Formal analysis, Investigation, Data curation, Writing – original draft, Visualization, Project administration, Funding acquisition. BSS: Validation, Formal analysis, Supervision, Project administration. YAS: Validation, Formal analysis, Supervision, Project administration. KU: Supervision. AML: Supervision.

Funding Statement: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Conflict of Interest Statement: The authors declare no conflict of interest.

REFERENCES

- Amanda, S. D., Fahrurnisa, T., & Mardiaty. (2024). Pengaruh kepercayaan diri terhadap hasil belajar matematika. *Jurnal Inovasi Pendidikan dan Teknologi Informasi (JIPTI)*, 5(2), 338–344. <https://doi.org/10.52060/jipti.v5i2.2241>
- Arikunto, S. (2021). *Dasar-dasar evaluasi pendidikan* (3rd ed.). Bumi Aksara. <https://books.google.com/books?id=j5EmEAAAQBAJ>
- Badan Pusat Statistik Kabupaten Tapanuli Tengah. (2023). *Statistik kesejahteraan rakyat Kabupaten Tapanuli Tengah 2023*. <https://tapanulitengahkab.bps.go.id/id/publication/2023/12/28/e531c00500c96517e3674535/statistik-kesejahteraan-rakyat-kabupaten-tapanuli-tengah-2023.html>
- Creswell, J. W., & Creswell, J. D. (2023). *Research design: Qualitative, quantitative, and mixed methods approaches* (6th ed.). SAGE Publications. <https://www.sagepub.com/shop/buy-a-book/research-design-6-270550>
- Conger, R. D., & Donnellan, M. B. (2007). An interactionist perspective on the socioeconomic context of human development. *Annual Review of Psychology*, 58, 175–199. <https://doi.org/10.1146/annurev.psych.58.110405.085551>
- Fahrurrozi, F., Sari, Y., & Wiguna, P. (2022). Studi literatur: Pengaruh status sosial ekonomi orang tua terhadap hasil belajar siswa sekolah dasar. *Edukatif: Jurnal Ilmu Pendidikan*, 4(4), 5472–5479. <https://doi.org/10.31004/edukatif.v4i4.3009>
- Fatmasari, Y., & Kurniawan, L. A. (2021). Pengaruh status sosial ekonomi orang tua dan motivasi belajar terhadap hasil belajar siswa. *Jurnal Inovasi Pendidikan MH Thamrin*, 5(1), 36–45. <https://doi.org/10.37012/jipmht.v5i1.726>
- Husna, A. M., Hadi, Y. A., & Mukti, H. (2026). Pengaruh status sosial ekonomi orang tua terhadap motivasi belajar siswa kelas IV MI NW Kelayu Jorong. *Transformasi: Jurnal Penelitian dan Pengembangan Pendidikan Non Formal Informal*, 12(1), 496–506. <https://doi.org/10.33394/jtni.v12i1.17804>
- Khasanah, U., Dwiyan, S., Permadi, Z. N., & Nurtamam, M. E. (2025). Analisis performa akademik siswa berdasarkan status sosial ekonomi dalam mata pelajaran Bahasa Indonesia di sekolah dasar. *Jurnal Pendidikan Dasar*, 13(1), 32–39. <https://doi.org/10.20961/jpd.v13i1.100629>
- Natasya, S., Putri, S. A., Purnaningsih, S., Pambudi, T. R. S., Puspitasari, T. N., Rakhmawati, U. A., & Susanti, M. M. I. (2025). Pengaruh status sosial ekonomi orang tua terhadap kemampuan matematika peserta didik kelas IV di SD Negeri 1 Klaten. *Jurnal Pendidikan dan Pembelajaran Indonesia (JPPI)*, 5(3), 1411–1419. <https://doi.org/10.53299/jppi.v5i3.1585>

- Rahardi, F., & Dartanto, T. (2021). Growth mindset, delayed gratification, and learning outcome: Evidence from a field survey of least-advantaged private schools in Depok, Indonesia. *Heliyon*, 7(4), e06681. <https://doi.org/10.1016/j.heliyon.2021.e06681>
- Rohmah, S. T., Sah, S. Y., & Nurtamam, M. E. (2025). Dampak status sosial ekonomi terhadap hasil belajar siswa menggunakan metode systematic literature review. *Jurnal Pendidikan Dasar*, 13(1), 47–58. <https://doi.org/10.20961/jpd.v13i1.100659>
- Sirin, S. R. (2005). Socioeconomic status and academic achievement: A meta-analytic review of research. *Review of Educational Research*, 75(3), 417–453. <https://doi.org/10.3102/00346543075003417>
- Sitohang, A. H., Malau, L., & Purba, Y. O. (2023). Hubungan antara status sosial ekonomi orang tua, perhatian orang tua, dan lingkungan belajar siswa terhadap prestasi belajar matematika siswa kelas XI SMA Teladan Pematang Siantar T.A. 2022/2023. *Innovative: Journal of Social Science Research*, 3(2), 4176–4190. <https://j-innovative.org/index.php/Innovative/article/view/814>
- Sudirman, & Budi, W. (2024). Status sosial ekonomi orang tua, lingkungan belajar terhadap hasil belajar siswa. *Jurnal Pendidikan Ekonomi dan Bisnis*, 1(1), 1–17. <https://doi.org/10.70311/jpeb.v1i1.1>
- Sugiyono. (2022). *Metode penelitian kuantitatif, kualitatif, dan R&D*. Alfabeta. <https://opac.perpusnas.go.id/DetailOpac.aspx?id=1543971>
- Supit, D., & Gosal, N. M. (2023). Hubungan status sosial ekonomi orang tua dan prestasi belajar siswa. *Jurnal Educatio FKIP UNMA*, 9(1), 177–182. <https://doi.org/10.31949/educatio.v9i1.4557>
- Ummah, N. R., Qodariyah, N. A., & Nurtamam, M. E. (2025). Faktor sosial ekonomi keluarga: Analisis pada hasil belajar matematika siswa sekolah dasar. *Jurnal Inovasi Pendidikan dan Teknologi Informasi (JIPTI)*, 6(1), 227–237. <https://doi.org/10.52060/jipti.v6i1.2891>
- Wijaya, R., Utami, R. S. D., & Nurtamam, M. E. (2025). Dampak faktor sosial ekonomi orang tua terhadap hasil belajar: Systematic literature review. *Jurnal Pendidikan Dasar*, 13(1), 92–101. <https://doi.org/10.20961/jpd.v13i1.100698>