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The Effect of Self-Reliance and Parental Involvement on Elementary Student Learning Outcomes in Border Areas

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Abstract
This study examines the effects of self-reliance and parental involvement on the learning outcomes of public elementary school students in the Nunukan border area. The study used a quantitative correlational design with second-grade students at SD Negeri 003 Kecamatan Nunukan as the units of analysis. Students completed the self-reliance questionnaire, parents or guardians completed the parental involvement questionnaire, and the school provided academic learning-outcome records. The analysis used descriptive statistics, instrument-quality tests, available regression diagnostics, and multiple linear regression. The results show that self-reliance has a positive coefficient direction but does not make a statistically significant partial contribution to learning outcomes. Parental involvement makes a positive and significant contribution and shows a stronger relative contribution than self-reliance. The combined model significantly predicts learning outcomes, although its explanatory power remains limited. The findings show that student independence alone does not adequately explain elementary school learning outcomes in a border-area setting. Family support, communication, learning assistance, academic monitoring, and age-appropriate opportunities for independent action need balanced implementation. Schools can strengthen family-school partnerships while developing students' self-reliance gradually in line with their developmental stage.
Keywords: self-reliance; parental involvement; learning outcomes; elementary school; border area.

INTRODUCTION

Elementary education establishes the academic skills, learning habits, and psychosocial foundations that students use at later levels of schooling. Many children in low- and middle-income countries still do not achieve age-appropriate reading proficiency, which shows the continuing challenge of foundational learning (World Bank et al., 2022). PISA 2022 also places Indonesian students' reading performance below the OECD average and underscores the need to strengthen learning support from the primary years (OECD, 2023). Border-area schools face additional educational challenges because access to services and learning resources is not always evenly distributed. Geographic conditions, resource availability, connectivity, and unequal educational support can widen differences in students' learning experiences (UNESCO, 2023). Nunukan Regency lies along the Indonesia-Malaysia border and includes diverse social and geographic settings. Regional

statistics record a portion of the population that has not completed elementary education, which may create variation in families' capacity to support children's schooling (Badan Pusat Statistik Kabupaten Nunukan, 2024).

Elementary students' learning outcomes emerge from the interaction of personal and environmental factors. Beliefs about personal capability influence students' choices, effort, persistence, and responses to academic difficulty (Bandura, 1997). This study represents one personal factor through self-reliance, defined as a child's capacity to initiate tasks, accept responsibility, attempt solutions, persist through difficulty, and seek help appropriately. Self-reliance overlaps with self-regulated learning, but early elementary students still develop these capacities within structures provided by adults (Savina, 2021).

Intervention research shows that self-regulation training can improve reading, writing, and mathematics achievement among primary and secondary students when learning strategies and environmental support are intentionally organized (Elhusseini et al., 2022). A recent review of primary education also reports positive effects when self-regulated learning strategies are taught explicitly and embedded in classroom activities (Olid-Luque et al., 2025). These findings position self-reliance as an important developmental capacity whose academic contribution may vary across contexts and developmental stages.

Family environments provide one of the closest external influences on children's learning. Parents can participate through communication, learning assistance, academic monitoring, provision of learning resources, and interaction with schools. A second-order meta-analysis covering decades of research reports a positive association between parental involvement and academic achievement, with effect sizes varying across forms of involvement (Kim, 2022). Autonomy-supportive involvement is also associated with stronger motivation and academic performance than highly controlling forms of involvement (Lerner et al., 2022).mBorder-area elementary schools need evidence that considers student and family factors in the same analytic model. Family-school partnerships can provide support when schools serve communities with varied resources and family backgrounds (Mu et al., 2023). Research that tests self-reliance and parental involvement together among early-grade students in Nunukan remains limited. This study examines the partial contribution of self-reliance and parental involvement to learning outcomes and tests their combined contribution among second-grade students at SD Negeri 003 Kecamatan Nunukan.

RESEARCH METHODS

This study used a quantitative correlational design to test the statistical contribution of self-reliance and parental involvement to learning outcomes

without applying an experimental treatment. The term effect refers to predictive contribution within the regression model rather than a definitive causal relationship. Quantitative correlational designs allow researchers to test relationships among measured variables through numerical data and statistical analysis (Creswell and Creswell, 2018).

The analysis included 93 second-grade students at SD Negeri 003 Kecamatan Nunukan, North Kalimantan. Students completed the self-reliance scale, while parents or guardians completed the parental involvement scale. The school supplied official learning-outcome records from the same instructional period. The self-reliance instrument contained 24 items, and the parental involvement instrument contained 30 items with four response options. A pilot test involved 30 respondents. All items met the empirical validity criteria, while internal consistency reached Cronbach's alpha values of 0.986 for self-reliance and 0.989 for parental involvement.

The researchers analyzed the data using descriptive statistics, instrument-quality testing, available regression diagnostics, multiple linear regression, t tests, the F test, and the coefficient of determination. The Kolmogorov-Smirnov test assessed residual normality, the available linearity test assessed the self-reliance-learning outcome relationship, and tolerance and variance inflation factor values assessed multicollinearity. The analysis used a significance level of 0.05. The study applied parental or guardian consent, identity confidentiality, anonymity, voluntary participation, child protection, and restrictions on data use for academic purposes.

The study operationalized self-reliance through initiative, responsibility, task-completion effort, persistence, simple decision making, and appropriate help seeking. Parental involvement covered parenting, communication, home learning assistance, academic monitoring, motivational support, provision of learning facilities, communication with teachers or schools, and opportunities for children to develop independence. The regression analysis used continuous scores to preserve variation among students. The available analysis file did not include heteroscedasticity output or a linearity test for parental involvement and learning outcomes, so interpretation remains limited to the reported diagnostics.

RESULT AND DISCUSSION

The analysis covered 93 second-grade students and three main variables: self-reliance, parental involvement, and learning outcomes. The results present descriptive statistics, instrument quality, regression diagnostics, partial tests, the simultaneous test, and the meaning of the findings for elementary education in a border-area setting.

Table 1. Descriptive Statistics of the Study Variables

Variable	N	Mean	Median	Standard Deviation
Self-Reliance	93	81.3763	81.0000	10.16378
Parental Involvement	93	106.2151	106.0000	11.18019
Learning Outcomes	93	570.2258	570.0000	37.54537

Source: Processed research data.

Table 2. Summary of Instrument Quality

Variable	Number of Items	Item-total r Range	Cronbach's Alpha	Conclusion
Self-Reliance	24	0.866-0.982	0.986	Valid and reliable
Parental Involvement	30	0.866-0.982	0.989	Valid and reliable

Source: Processed research data.

Data Characteristics and Measurement Quality

All 93 students provided complete data for the three study variables. Self-reliance had a mean of 81.38 with a standard deviation of 10.16, while parental involvement had a mean of 106.22 with a standard deviation of 11.18. Learning outcomes had a mean of 570.23 with a standard deviation of 37.55. The thesis categorization criteria placed self-reliance and parental involvement in the high category and learning outcomes in the medium category relative to the sample distribution. The descriptive profile shows that high average scores for self-reliance and parental involvement do not translate into equally high learning outcomes for every student. Learning outcomes reflect multiple influences, so a high score on one psychological or family characteristic cannot account for the full range of academic performance. Social cognitive theory explains learning behavior through reciprocal interactions among personal factors, behavior, and the environment (Bandura, 1997).

The instrument assessment showed very high internal consistency. The self-reliance scale reached a Cronbach's alpha of 0.986, while the parental involvement scale reached 0.989. These values support score consistency in the study sample, although very high reliability should also be considered alongside item homogeneity and construct coverage to ensure that an instrument does not rely on overly similar statements. The regression diagnostics showed normally distributed residuals based on a Kolmogorov-Smirnov p value of 0.200. The self-reliance-learning outcome relationship met the linearity criterion based on a Deviation from Linearity value of 0.504. Both predictors had a tolerance value of 0.635 and a VIF of 1.575, indicating no

multicollinearity problem. The available analysis file did not provide heteroscedasticity results or a linearity test for parental involvement and learning outcomes, which limits the completeness of the diagnostic assessment. The use of different data sources strengthened the measurement design because students reported self-reliance, parents or guardians reported parental involvement, and school records supplied learning outcomes. This separation reduces dependence on a single respondent, although self-report measures still carry the possibility of perception bias.

Research on elementary students' self-regulated learning also emphasizes the need to match instruments with children's developmental phase and the specific regulation process being measured (Koivuniemi et al., 2021). The high categories for self-reliance and parental involvement describe the location of scores under the study's descriptive criteria rather than proof that every student reached an optimal level. Continuous scores still contain variation within each category and provide the basis for the regression analysis. The distinction between descriptive categories and inferential tests keeps the conclusions aligned with the statistical relationships that the study actually examined.

The mean learning-outcome score fell in the medium category relative to the sample distribution. This pattern leaves substantial academic variation even when the mean scores for both predictors fall in the high category. The result supports a multidimensional view of learning outcomes rather than a direct consequence of one student or family characteristic. Research on family involvement likewise shows that the strength of its association with achievement changes across forms and contexts of involvement (Kim, 2022).

Effect of Self-Reliance on Learning Outcomes

The regression equation was Y = 440.249 + 0.175X1 + 1.090X2. Self-reliance had a positive unstandardized coefficient of 0.175, but the t test produced t=0.383 and p=0.702. This p value indicates that self-reliance did not make a statistically significant partial contribution to learning outcomes after parental involvement was included in the model. The standardized beta for self-reliance was 0.047, which indicates a relatively small unique contribution.

Table 3. Multiple Linear Regression Coefficients

Predictor	B	Std. Error	Beta	t	p
Constant	440.249	36.875	-	11.939	<0.001
Self-Reliance	0.175	0.457	0.047	0.383	0.702
Parental Involvement	1.090	0.415	0.324	2.624	0.010

Source: Processed research data.

The self-reliance result highlights the developmental nature of independence among second-grade students. At this stage, self-reliance includes initiating tasks, accepting responsibility, attempting to complete work, persisting through difficulty, and using help appropriately. Early elementary students continue to develop attention regulation, behavioral control, and executive functioning, which can make these capacities less stable across situations (Savina, 2021). Meta-analytic evidence indicates that self-regulation interventions can improve academic achievement among children and adolescents. These effects arise when cognitive, metacognitive, and behavioral-management strategies are explicitly taught rather than from simply labeling students as highly independent (Elhusseini et al., 2022). This distinction helps explain why high self-reliance scores in the present study did not produce a significant unique contribution to academic scores.

Self-monitoring produces stronger academic benefits when students use it within an intervention package and receive support from the learning environment. Teacher, peer, or technological support can strengthen the effect of monitoring strategies on academic performance (Guo, 2022). This evidence places self-reliance within a supportive context rather than treating it as an isolated individual trait.

Effective self-regulated learning programs in primary education usually combine explicit strategy instruction, repeated practice, and teacher-provided learning structure. A recent systematic review reports improvements in self-regulation and, in many cases, academic achievement when primary students receive such structured programs (Olid-Luque et al., 2025). The difference between structured intervention and the measurement of a behavioral tendency may partly explain why the present findings differ from intervention studies. A local elementary-school study found an association between learning independence and mathematics achievement. Differences in grade level, subject matter, indicators of independence, and analytical techniques can produce different relationship patterns across studies (Rahmawati et al., 2023). The Nunukan study tested self-reliance together with parental involvement, so its partial coefficient represents the unique contribution of self-reliance after parental involvement is held constant.

Second-grade students still need routines, guidance, concrete examples, and adult assistance when they face academic demands. Self-regulation during the early school years can improve, but classroom conditions and support patterns strongly shape its development (Savina, 2021). This developmental profile frames self-reliance as guided independence rather than an expectation that children manage all learning tasks alone. Teachers can develop age-appropriate independence through structured responsibilities in daily learning. Students

can prepare materials, begin tasks, choose simple strategies, check their work, and request help after making an initial effort. Self-regulatory behaviors become more useful when teachers embed them in consistent learning routines and the environment provides appropriate support (Guo, 2022). The positive coefficient direction indicates that higher self-reliance scores move in the same direction as higher predicted learning outcomes, although the association is too weak to reach statistical significance in this sample. The finding should be read as a context-specific result rather than a rejection of independence as an educational goal. Future research can measure self-reliance through behavioral indicators, teacher observations, or longitudinal designs that capture changes in independent functioning over time.

Effect of Parental Involvement on Learning Outcomes

Parental involvement produced an unstandardized coefficient of 1.090 with t=2.624 and p=0.010. The positive coefficient and p value below 0.05 indicate a positive and statistically significant partial contribution to learning outcomes after self-reliance is controlled. The standardized beta of 0.324 also exceeds the self-reliance beta, making parental involvement the stronger predictor among the two variables in the model. A broad evidence base links parental involvement with academic achievement. A second-order meta-analysis that synthesized 23 meta-analyses and more than one thousand primary studies found a positive relationship between parental involvement and achievement among school-age students (Kim, 2022). Another meta-analysis spanning preschool through secondary education also reported a positive effect, although the average effect was modest and varied across forms of involvement (Erdem and Kaya, 2020).

Parent-involvement programs for young children can improve academic as well as social-emotional outcomes. These effects show that family support extends beyond helping children complete homework (Cosso et al., 2022). The present study measured parental involvement through parenting, communication, learning assistance, academic monitoring, motivation, learning facilities, teacher contact, and opportunities for children to develop independence. The quality of parental involvement matters more than frequency alone. Autonomy-supportive involvement is associated with competence, more autonomous motivation, and stronger academic performance among school-age children (Lerner et al., 2022). This distinction separates constructive involvement from high control or direct takeover of children's schoolwork.

A meta-analysis of parental homework involvement distinguishes supportive practices from intrusive involvement. Autonomy support shows a positive relationship with mathematics achievement, while intrusive or highly controlling involvement shows a less favorable direction (Jiang et al., 2023). The

evidence supports interpretation of parental-involvement scores through the quality of practices rather than the number of activities parents perform. Parents can provide external structure while second-grade students continue to develop self-regulation. Study routines, reminders, task-related communication, learning resources, and proportionate assistance can help children maintain attention to school demands. Such support provides structure while preserving opportunities for children to develop independence (Lerner et al., 2022).

Systematic reviews in basic education show that family involvement generally benefits children's learning, while effectiveness depends on parent, child, teacher, and school characteristics. Schools need to organize relationships among these participants so educational support extends beyond formal events or occasional communication (Kamal et al., 2023). The Nunukan findings support the inclusion of parental involvement as a planned part of the educational process.

Family-school partnerships also operate at the institutional level. A systematic review shows that partnerships among families and educational institutions can broaden support for child development, while effective implementation requires attention to relationships, access, and social inequality (Mu et al., 2023). Border-area schools can use flexible partnership models that reflect differences in parents' work, education, distance, and available time. The thesis data show substantial variation in parents' educational and occupational backgrounds. The analysis did not test these demographic characteristics as moderators, so the parental-involvement coefficient cannot be attributed to any single occupational or educational category. The interpretation remains focused on the educational support practices measured by the parental involvement instrument.

Schools can use these findings to strengthen two-way communication with families. Communication can address learning habits, developing independence, appropriate task assistance, and forms of home support rather than focusing only on grades or discipline. Supportive involvement fits children's developmental needs more closely than practices that simply increase control over schoolwork (Jiang et al., 2023). Daily home involvement and school-oriented involvement serve complementary functions in children's education. Families can maintain routines, discuss lessons, and monitor difficulties while also communicating regularly with teachers. Reviews of parent-involvement programs for young children show academic and social-emotional benefits when program design matches children's developmental needs (Cosso et al., 2022). Border-area families may face different levels of access to school activities because of work, distance, time, and available

resources. Schools can respond with flexible communication options and realistic home-support tasks instead of using a single form of involvement as a universal standard. Research on family-institution partnerships emphasizes access and inequality as important considerations in collaborative design (Mu et al., 2023). The significant parental-involvement coefficient represents one part of the learning-outcome model rather than a single determinant of achievement. Its standardized beta exceeds the self-reliance beta, but the two predictors leave a large portion of academic variation unexplained. Schools should place family involvement alongside teaching quality, foundational skills, motivation, socioeconomic conditions, and students' opportunities to learn.

Combined Effects, Border-Area Context, and Educational Implications

The F test showed F=6.493 with p=0.002, indicating that the model containing self-reliance and parental involvement significantly predicts learning outcomes. The multiple correlation coefficient was R=0.355. The model explained 12.6% of the variance in learning outcomes (R^2=0.126), while the adjusted R^2 of 0.107 reflects its explanatory power after accounting for the number of predictors and sample size.

Table 4. Summary of the Model and Hypothesis Tests

Test	Statistic	p	Decision
Self-Reliance -> Learning Outcomes	t = 0.383	0.702	Not significant
Parental Involvement -> Learning Outcomes	t = 2.624	0.010	Positive and significant
X1 + X2 -> Learning Outcomes	F = 6.493	0.002	Model significant
Coefficient of determination	R^2 = 0.126	-	12.6% of variance explained

Source: Processed research data.

The simultaneous model combines two predictors with different partial contributions. The t tests identify parental involvement as the statistically significant partial predictor, while self-reliance does not reach significance. The most accurate interpretation is that personal and family factors together provide predictive information for learning outcomes, with parental involvement showing the stronger unique contribution in this dataset. The modest explanatory power indicates that learning outcomes are multidimensional. Most score variation relates to factors outside the model, but the present study cannot identify which unmeasured factors carry the largest contribution. Cognitive ability, motivation, self-regulation, teaching quality,

school climate, peer support, learning facilities, and family conditions remain plausible influences on academic achievement.

An ecological perspective fits the learning conditions of a border-area school. Children develop through interactions with their closest environments, especially family and school, so experiences in one setting can shape learning in another (Bronfenbrenner, 1979). The findings show that family support retains predictive value even when a student-level factor enters the model. Nunukan's local context requires caution when extending the findings beyond the study school. Border areas contain variation in access, social conditions, and family educational backgrounds that can produce different school experiences. Regional statistics document heterogeneous educational attainment among residents and provide relevant context for home learning support (Badan Pusat Statistik Kabupaten Nunukan, 2024). Evidence from one school cannot represent every educational setting across the regency.

Schools can use the simultaneous result to connect the development of independence with family involvement. Teachers can build self-reliance through gradual tasks and responsibilities, while parents provide structure, encouragement, and assistance when children need it. Autonomy-supportive parental involvement can strengthen motivation and academic performance without promoting dependence (Lerner et al., 2022). Schools can establish structured communication through regular meetings, progress notes, brief consultations, or communication media that families can access easily. Communication should focus on ways to support the learning process rather than only reporting outcomes. Family-school partnership research shows stronger potential benefits when collaboration develops continuously instead of appearing only in ceremonial activities (Mu et al., 2023).

Parent-guidance programs should distinguish supportive assistance from excessive intervention. Parents can prepare a learning environment, discuss tasks, provide examples, and encourage children to try again after difficulty. Meta-analytic evidence shows that homework involvement can become less beneficial when it is intrusive or highly controlling (Jiang et al., 2023). Schools need to communicate both the value of parental involvement and developmentally appropriate ways to provide it. Teachers can develop self-reliance while schools improve the quality of parental involvement. Classroom tasks can offer simple choices, checklists, self-review opportunities, and reinforcement for effort. Meta-analytic evidence shows that self-monitoring produces greater academic benefits when students receive adequate environmental support (Guo, 2022). This approach treats independence as a learning outcome built through scaffolding rather than as a prerequisite that children must already possess.

Future studies should measure self-reliance with methods that capture children's regulation processes more directly. Instruments can assess learning strategies, monitoring, help seeking, and phases of regulation so that scores reflect actual learning processes more closely (Koivuniemi et al., 2021). Teacher observations, parent reports, or performance tasks can complement student self-reports. Future models can include variables that operate closer to students' daily learning. Motivation, self-efficacy, reading and numeracy skills, teacher-student interaction quality, attendance, access to learning resources, and socioeconomic status can increase the explanatory scope of the model. Research on self-regulation indicates that interventions combining several strategies with contextual support tend to produce more consistent effects (Elhusseini et al., 2022).

Longitudinal designs can test whether self-reliance in the early grades becomes a stronger predictor as children grow older and academic demands increase. Multi-school studies can also represent the range of border-area characteristics more adequately. Reviews of self-regulated learning programs in primary education continue to call for stronger evaluation designs and more consistent reporting (Olid-Luque et al., 2025). School management can translate the findings into programs that connect student learning goals with family support. Teachers can communicate one or two learning habits for practice at home, and parents can allow children to carry out those habits independently before offering assistance. This structure keeps families engaged without taking over children's tasks. Autonomy-supportive involvement is associated with stronger motivation and academic performance than highly controlling support (Lerner et al., 2022).

Education policy should recognize that the model explains only a limited portion of learning-outcome variance. Achievement programs need more than parenting seminars or student-independence training. Schools can integrate family support with teaching quality, foundational-skill mapping, assistance for struggling students, and access to learning resources. Cross-context evidence shows a positive but heterogeneous contribution of parental involvement, which supports locally adapted interventions (Erdem and Kaya, 2020). This study has several limitations related to sample scope and measurement. The sample came from one school and included a limited number of students, so the findings require caution when applied to the wider Nunukan Regency. Student questionnaires measured self-reliance, and parent or guardian questionnaires measured parental involvement, which leaves room for reporting bias. School records represented academic learning outcomes but did not capture other dimensions of child development.

The available diagnostic output adds another limitation to the statistical interpretation. The analysis file contains residual normality, linearity for self-reliance and learning outcomes, and multicollinearity results, but it does not contain heteroscedasticity output or a linearity test for parental involvement and learning outcomes. This limitation does not alter the reported regression coefficients, but it reduces the completeness of the model-diagnostic evidence. The findings distinguish the roles of a personal developmental capacity and family support among second-grade students. Self-reliance remains educationally important but does not show a significant partial contribution to academic scores in this model. Parental involvement shows a more direct statistical relationship with learning outcomes. The results support an educational strategy in which families and schools help children become progressively more independent while preserving children's own effort and responsibility.

CONCLUSION

The study shows that self-reliance has a positive coefficient direction but does not make a statistically significant partial contribution to the learning outcomes of second-grade students at SD Negeri 003 Kecamatan Nunukan. Parental involvement makes a positive and significant contribution and serves as the stronger predictor in the tested model. The combined regression model significantly predicts learning outcomes, although it explains only a limited proportion of score variation. The findings place elementary students' achievement within the interaction of personal development and family support rather than within student characteristics alone. Schools can strengthen communication with parents, provide guidance on supportive learning assistance, and design classroom activities that train initiative and responsibility. Teachers and families should develop independence through age-appropriate opportunities to try, make decisions, complete tasks, and seek help when needed. School interventions can also connect student-capacity development with family support instead of treating them as separate agendas. Future research can involve more schools, use multi-informant measures of self-reliance, complete all regression diagnostics, and include factors such as motivation, foundational skills, teaching quality, access to learning resources, and socioeconomic conditions to explain learning outcomes more fully.

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