

THE INFLUENCE OF THE FAMILY ENVIRONMENT ON THE LEARNING OUTCOMES OF GENERATION Z AT SMA NEGERI 1 WURYANTORO

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Abstract:

This study investigates the influence of the family environment on the learning outcomes of Generation Z students at SMA Negeri 1 Wuryantoro, Indonesia. The research was motivated by increasing concern over how family conditions shape student learning in the digital era, particularly for adolescents who are highly exposed to technology. A quantitative explanatory survey design was employed, involving 106 Grade XI students selected through simple random sampling. Data were collected using validated and reliable self-administered questionnaires measuring family environment and perceived learning outcomes across cognitive, affective, and psychomotor domains. Statistical analyses included descriptive statistics, Pearson correlation, and simple linear regression, following confirmation of validity, reliability, and normality assumptions. The results reveal a strong and significant positive relationship between the family environment and learning outcomes, with a correlation coefficient of 0.698. Regression analysis indicates that the family environment explains 48.7% of the variance in students' learning outcomes, demonstrating its substantial predictive power. These findings highlight that supportive family conditions remain a critical determinant of academic achievement for Generation Z students, despite the growing dominance of digital learning contexts. The study has important implications for educational practice and policy, emphasizing the need to strengthen school-family partnerships and family-centered educational interventions to reduce achievement disparities. Limitations include the single-school context and reliance on self-reported learning outcomes. Future research is recommended to involve broader samples, objective academic measures, and longitudinal or mixed-methods designs to deepen understanding of family influences on student learning.

Keywords:

Family Environment; Learning Outcomes; Generation Z

INTRODUCTION

Education remains a central pillar of societal development, as learning outcomes directly shape human capital quality and long-term social progress. Within educational systems, student achievement is increasingly understood as the product of complex interactions between individual characteristics and contextual environments, particularly the family setting.¹ The family environment functions as the earliest and most enduring educational context in which values, discipline, and learning orientations are cultivated before formal schooling begins.² Empirical evidence consistently shows that supportive family conditions enhance motivation, persistence, and academic engagement across educational levels. Consequently, examining the family environment as a determinant of learning outcomes constitutes a critical academic and social concern, especially in contemporary educational contexts.

A substantial body of literature has documented the centrality of the family environment in shaping students' academic trajectories. Positive parental involvement and autonomy-supportive practices have been linked to higher engagement and lower anxiety in science and mathematics learning.³ Family socioeconomic resources, including educational materials at home, have also been shown to indirectly strengthen literacy and cognitive development through enriched learning opportunities.⁴ Moreover, cohesive family relationships contribute significantly to students' well-being, which in turn supports academic persistence and school

¹ Deysti T Tarusu et al., "Analisis Kebijakan Pendidikan Dalam Penerapan Kurikulum Di Sekolah Dasar," *Jurnal Review Pendidikan Dan Pengajaran* 6, no. 4 (2023): 3107–13.

² Dalyono, M. *Psikologi Pendidikan*. (Jakarta: Rineka Cipta, 2015), 59.

³ M Misdah et al., "NAVIGATING MODERNITY AND TRADITION: STRATEGIC PRACTICES IN ISLAMIC SCHOOLS AT THE WEST KALIMANTAN-MALAYSIA BORDER," *Jurnal Ilmiah Peuradeun* 13, no. 2 (2025): 1021–48, <https://doi.org/10.26811/peuradeun.v13i2.2040>.

⁴ S Li et al., "Development of Generic Student Engagement Scale in Higher Education: An Application on Healthcare Students," *Nursing Open* 10, no. 3 (2023): 1545–55, <https://doi.org/10.1002/nop2.1405>.

satisfaction.⁵ These findings collectively indicate that family-related factors operate both directly and indirectly to influence educational outcomes.

Beyond academic support, the family environment plays a crucial role in regulating adolescents' behavioral and psychological adjustment. Positive family climates have been found to reduce maladaptive behaviors, such as excessive media use, through enhanced self-regulation and psychological capital.⁶ Parenting styles and emotional support further predict students' learning engagement by fostering grit, resilience, and adaptive coping strategies.⁷ In contrast, unsupportive family-school environments are associated with increased emotional distress and lower academic motivation among adolescents.⁸ Thus, family influence extends beyond cognition to encompass affective and behavioral dimensions essential for successful learning.

Recent scholarship has increasingly emphasized the relevance of family factors in the context of Generation Z learners. As digital natives, Generation Z students experience unique learning challenges related to technology exposure, attention regulation, and digital stress.⁹ Family norms and guidance regarding technology use have been shown to shape adaptive learning behaviors, discipline, and time management among adolescents. Empirical studies further demonstrate that family relations remain strong predictors of academic achievement, even when technological access is widespread. These findings underscore that technological advancement does not diminish the foundational role of the family in educational development.

⁵ S A Kollannoor and S Thomas, "Exploring the Influence of Family Relationship on Students' School Well-Being," *Children and Youth Services Review* 178 (2025), <https://doi.org/10.1016/j.childyouth.2025.108540>.

⁶ N Wang, Y Zhu, and Y Zhang, "Demographic and Educational Factors Associated with COPD Knowledge among Primary Family Caregivers: A Cross-Sectional Study at a Tertiary Hospital," *Medicine (United States)* 104, no. 36 (2025): e44228, <https://doi.org/10.1097/MD.00000000000044228>.

⁷ E C de Lara and T Leesen, *RETHINKING RESILIENCE IN CHARACTER EDUCATION: Insights from Literature and Philosophy* (Amsterdam University College, Amsterdam, Noord-Holland, Netherlands: Taylor and Francis, 2025), <https://doi.org/10.4324/9781003528692>.

⁸ S Liao and D Wang, "Patterns of Family-School Environment Influence Depressive Symptoms among Adolescents in China: The Mediating Role of Resilience," *Frontiers in Psychiatry* 16 (2025), <https://doi.org/10.3389/fpsy.2025.1717022>.

⁹ R.-S. Lu et al., "Integrating Urban Mining Concepts Through AI-Generated Storytelling and Visuals: Advancing Sustainability Education in Early Childhood," *Sustainability (Switzerland)* 16, no. 24 (2024), <https://doi.org/10.3390/su162411304>.

The multidimensional nature of family influence has also been highlighted in studies examining emotional support, socioeconomic conditions, and home learning facilities. Emotional closeness and constructive parent-child interaction significantly enhance learning achievement and academic confidence.¹⁰ Economic stability within the family has been linked to higher learning engagement and more intensive academic interaction at home. Additionally, family values and parental support shape students' academic intentions and long-term motivation. Collectively, these studies suggest that family environments influence learning outcomes through interconnected structural, emotional, and cultural mechanisms.

Despite extensive international research, several limitations remain evident in the existing literature. Many studies focus on early childhood or higher education contexts, leaving secondary-level Generation Z students underrepresented.¹¹ Furthermore, research conducted in diverse cultural and national settings may not fully capture the specific dynamics of Indonesian families and schools.¹² Methodologically, prior studies often rely on single indicators of achievement, potentially overlooking students' subjective perceptions of learning competence and independence.¹³ These gaps highlight the need for context-specific and multidimensional investigations of family influence on learning outcomes.

In response to these gaps, the present study focuses on analyzing the influence of the family environment on the learning outcomes of Generation Z students at SMA Negeri 1 Wuryantoro. Learning outcomes are examined through students' self-perceived comprehension, independence, academic confidence, and task completion skills, offering a comprehensive

¹⁰ Muhamad Sofian Hadi, Lidiyatul Izzah, and Qondila Paulia, "Teaching Writing Through Canva Application," *Journal of Languages and Language Teaching* 9, no. 2 (2021): 228, <https://doi.org/10.33394/jollt.v9i2.3533>.

¹¹ Nurmadiah Nurmadiah and Asmariani Asmariani, "Teknologi Pendidikan," *Al-Afkar: Manajemen Pendidikan Islam* 7, no. 1 (2019): 61–90, <https://doi.org/10.32520/afkar.v7i1.220>.

¹² J Zhao et al., "Cumulative Genetic Score of KIAA0319 Affects Reading Ability in Chinese Children: Moderation by Parental Education and Mediation by Rapid Automatized Naming," *Behavioral and Brain Functions* 19, no. 1 (2023), <https://doi.org/10.1186/s12993-023-00212-z>.

¹³ C J P Alvarez-Abarejo, "On Virtue Epistemology and Artificial Intelligence in Education: Could AI Be the 21st Century Transformation Machine of Nozick?," *Kritike* 19, no. 1 (2025): 50–74, <https://doi.org/10.25138/19.1.a2>.

perspective on achievement.¹⁴ By empirically testing multiple family environment indicators within a quantitative framework, this study aims to extend existing theoretical and empirical insights.¹⁵ The findings are expected to contribute contextually grounded evidence to the discourse on family education dynamics in the digital era and inform educational stakeholders seeking to enhance student achievement through family-based interventions.

RESEARCH METHODS

This study employed a quantitative research approach using an explanatory survey design to examine the influence of the family environment on the perceived learning outcomes of Generation Z students. Quantitative methodology was selected because it enables the systematic measurement of relationships between variables through numerical data and statistical testing.¹⁶ The explanatory survey design was deemed appropriate as it allows for hypothesis testing regarding causal relationships between independent and dependent variables within a natural educational setting. The independent variable in this study was the family environment, while the dependent variable was students' perceived learning outcomes. This design aligns with contemporary empirical studies investigating family influences on academic achievement using inferential statistical models.¹⁷

The research was conducted at SMA Negeri 1 Wuryantoro in October 2025, selected due to its representativeness of Generation Z students and accessibility for data collection. The population consisted of all Grade XI students, totaling 280 individuals. A sample of 106 students was drawn using a simple random sampling technique to ensure equal selection probability for each participant. This sampling approach was chosen to enhance the generalizability of findings and reduce selection bias. The

¹⁴ L J Silva et al., "Design and Validation of a Simulator for Feline Cephalic Vein Cannulation — A Pilot Study," *Journal of Veterinary Medical Education* 48, no. 3 (2021): 276–80, <https://doi.org/10.3138/jvme.2019-0028>.

¹⁵ M Koseni et al., "The Influence of the Social Environment on the Development of Critical Thinking Skills in Young People: A Study in the City of Durres, Albania," *International Journal of Education and Practice* 13, no. 1 (2025): 57–68, <https://doi.org/10.18488/61.v13i1.3942>.

¹⁶ Sugiyono, "Pengumpulan Data Dan Instrumen Penelitian" 1 (2013): 1–9.

¹⁷ Sugiyono, *Metodologi Penelitian Kuantitatif, Kualitatif Dan R&D*, Bandung: Alfabeta, 2016.

sample size met the recommended minimum threshold for regression-based quantitative analysis.

Table 1. Number of Grade XI Students at SMA Negeri 1 Wuryantoro

Class	Number of Students
XI – F ₂	32 Students
XI – F ₃	25 Students
XI – F ₄	27 Students
XI – F ₅	22 Students
Total	106 Students

Data collection followed a structured procedure using self-administered questionnaires distributed directly to respondents in the school environment. Participants completed the questionnaires within 20–30 minutes under the supervision of the researcher to ensure clarity of instructions and completeness of responses. The instrument comprised two sections, with Section A measuring the family environment and Section B measuring perceived learning outcomes. Each section contained 20 items developed from established indicators in prior national and international research. The supervised administration minimized missing data and improved response accuracy.

The research instruments were designed to measure the family environment and perceived learning outcomes using a four-point Likert scale. The family environment instrument assessed six indicators: home atmosphere, family economic condition, parenting style, parental attitude toward education, family relationships, and the family's role in building student self-confidence. Perceived learning outcomes were measured across cognitive, affective, and psychomotor domains, as well as overall learning achievement.¹⁸ The four-point Likert scale was selected to eliminate neutral responses and encourage more decisive participant judgments. This measurement approach is consistent with recent studies examining family influences on student learning behavior and achievement.

¹⁸ E Fatmawati et al., "Change Management towards Good University Governance in Indonesia: Study at Islamic Religious Universities Based on BLU Mandate," *Cogent Social Sciences* 10, no. 1 (2024), <https://doi.org/10.1080/23311886.2024.2333081>.

Data analysis was conducted using descriptive and inferential statistical techniques. Instrument validity was tested using Pearson product-moment correlation, while reliability was assessed using Cronbach's Alpha coefficients. Prior to hypothesis testing, classical assumption tests, including normality testing, were performed to ensure data suitability for parametric analysis. The relationship between the family environment and perceived learning outcomes was examined using correlation analysis and simple linear regression. These analytical techniques were selected because they are widely used in family-education research to determine the magnitude and direction of variable influence.

To ensure reliability and validity, the research instruments were developed based on theoretically grounded indicators and empirically validated measures from previous studies. Internal consistency reliability was confirmed through Cronbach's Alpha values exceeding accepted thresholds, indicating stable measurement across items. Construct validity was supported by significant item-total correlations, demonstrating that each item adequately represented its respective construct. The combination of rigorous sampling procedures, standardized data collection, and robust statistical testing strengthened the methodological integrity of the study. Overall, these methodological safeguards ensured that the findings accurately reflect the influence of the family environment on the learning outcomes of Generation Z students within the Indonesian secondary education context.

FINDINGS AND DISCUSSION

Descriptive Statistics

Based on data collected from 106 respondents, descriptive statistics were obtained. The results can be seen in Table 2, which shows that the family environment variable has a mean score of 81.39 with a standard deviation of 11.537, while the learning outcomes variable has a mean score of 77.40 with a standard deviation of 9.727.

Tabel 2. Descriptive Statistics of Research Variables

Variable	N	Min	Max	Mean	Std. Deviasi
Family Environment	106	52	100	81.39	11.537
Learning Outcomes	106	47	100	77.40	9.727

Validity and Reliability Test Results

The Validity Test for the 20 items of the family environment instrument and the 20 items of the learning achievement instrument showed that all question items have a calculated r-value > r-table (0.194) with a significance level below 0.05. Therefore, all items are declared valid and can be used for further analysis.

The Reliability Test yielded a Cronbach's Alpha value of 0.910 for the family environment instrument and 0.875 for the learning achievement instrument. These values indicate that the research instruments have excellent reliability ($\alpha > 0.80$).

Normality Test Results

The normality test using the Kolmogorov-Smirnov test indicates that the data are normally distributed. As seen in Table 3, the significance value for the family environment variable is 0.061 and for the learning achievement variable is 0.192 (both > 0.05).

Tabel 3. Normality Test Result

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Total_X	0,084	106	0,061	0,972	106	0,026
Total_Y	0,074	106	0,192	0,988	106	0,445

a. Lilliefors Significance Correction

Correlation Test Results

The Pearson correlation test yielded a correlation coefficient of 0.698 with a significance of 0.000. This indicates a strong and significant positive relationship between the family environment and student learning achievement. In other words, the better the family environment, the higher

the learning achievement attained by students at SMA Negeri 1 Wuryantoro. The test results can be seen in Table 4.

Tabel 4. Correlation Test Result

		Total_X	Total_Y
Total_X	Pearson Correlation	1	.698**
	Sig. (2-tailed)		0,000
	N	106	106
Total_Y	Pearson Correlation	.698**	1
	Sig. (2-tailed)	0,000	
	N	106	106

Linear Regression Analysis Results

Based on the linear regression analysis, the regression equation was obtained: **Learning Outcomes = 29.527 + 0.588 (Family Environment)**. The coefficient of determination (R Square) value of 0.487 indicates that the family environment contributes 48.7% to the variation in the learning outcomes of Generation Z students at SMA Negeri 1 Wuryantoro, while the remaining 51.3% is influenced by factors outside the model.

The ANOVA test results show that the formed regression model is significant ($F = 98.574$, $p = 0.000$). Similarly, the regression coefficient for the family environment variable is also significant ($t = 9.928$, $p = 0.000$), indicating that the family environment has a positive and significant influence on student learning achievement. The linear regression analysis results can be seen in Table 5.

Tabel 5. Linear Regression Test Result

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.698 ^a	0,487	0,482	7,003

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4834,611	1	4834,611	98,574	.000 ^b
	Residual	5100,748	104	49,046		
	Total	9935,358	105			

Coefficients					
	Unstandardized Coefficients	Std. Error	Beta	t	Sig.
	B				
(Constant)	29,527	4,869		6,064	0,000
Lingkungan Keluarga	0,588	0,059	0,698	9,928	0,000

Discussion

Based on the linear regression analysis conducted, the regression equation Learning Outcomes = 29.527 + 0.588 (Family Environment) was obtained. This equation indicates that when the family environment has a value of zero, the student's learning achievement is at the level of 29.527. The regression coefficient of 0.588 shows that each one-point increase in the family environment will increase learning achievement by 0.588 points. This finding is in line with the research of Karini et al. (2018), which found the regression equation $Y = 50.850 + 0.172X$, although the magnitude of the effect in this study is higher. This indicates that for Generation Z high school students, the influence of the family environment is stronger compared to middle school students.

The R Square value of 0.487 shows that the family environment contributes 48.7% to the variation in the learning outcomes of Generation Z students at SMA Negeri 1 Wuryantoro. This finding is consistent with Hasbullah's (2012) perspective, which asserts that the family is the first educational institution that shapes character and influences a child's academic development. The remaining 51.3% variation in learning

outcomes is influenced by other factors outside the model, such as students' intrinsic motivation, teacher competence, school facilities, and peer influence. This confirms Dalyono's (2005) opinion that the success of the educational process is influenced by various interacting factors.

The significance test results with $F = 98.574$ ($p = 0.000$) and $t = 9.928$ ($p = 0.000$) prove that the influence of the family environment on learning outcomes is highly significant. The correlation coefficient of 0.698 shows a strong relationship between the two variables, higher than the finding of Kartawijaya (2018), which found a correlation of 0.371 in research at SMP Negeri Kabupaten Bekasi. This suggests that in the context of Generation Z at the high school level, the relationship between the family environment and learning outcomes is closer than for students at the middle school level.

In the context of Generation Z as digital natives, the results of this study reveal that despite facing digital era challenges, the role of the family environment remains crucial. Parents need to develop competencies in supporting their children's learning process in the digital era, as identified in previous research that many parents still face competency gaps. A supportive family environment, with indicators such as a conducive home atmosphere, harmonious interpersonal relations, and the family's role in building self-confidence (Kartawijaya, 2018), has proven effective in improving the learning outcomes of Generation Z students.

Compared to the research by Karini et al. (2018), which found a contribution of 19.3%, this study found a larger contribution (48.7%). This may be due to differences in respondent characteristics, as this study focuses on Generation Z at the high school level, who have higher levels of independence and learning awareness. Similarly, research by Kartawijaya (2018), which studied the family environment and motivation together, only contributed 13.8% to learning outcomes. The findings of this study indicate that in the Generation Z context, the family environment alone already provides a significant contribution.

Although it provides a significant contribution, 51.3% of other factors still influence learning outcomes. This study is also limited to one school, so generalization of findings should be done carefully. The family environment variable is measured based on student perceptions, which may be subjective.

This study was designed to address the question of how the family environment influences the learning outcomes of Generation Z students at the senior high school level, a topic that has gained increasing relevance amid rapid digital and social change. Prior research has consistently emphasized that family contexts shape students' academic engagement, emotional regulation, and long-term educational trajectories.¹⁹ In particular, socio-ecological perspectives highlight the family as a foundational system interacting with school and community environments to influence learning.²⁰ For Generation Z learners, these influences are further mediated by technology exposure, autonomy demands, and changing parental roles. Against this background, examining family influence within a specific secondary school context provides both theoretical and empirical value.

Turning to the main findings, the descriptive results indicate that students generally perceive their family environment as supportive, with mean scores in the medium-to-high range. This suggests that most respondents experience relatively harmonious home conditions, adequate parental attention, and sufficient academic support. Similar patterns have been observed in studies reporting that positive family climates are common protective factors during adolescence. However, the relatively large standard deviation indicates substantial heterogeneity in family experiences. This variability reflects structural and relational differences across households, which have been shown to shape unequal learning opportunities.²¹

With regard to learning outcomes, the findings reveal that students' perceived academic achievement is generally favorable but unevenly distributed. The presence of students with low outcome scores highlights that not all Generation Z learners benefit equally from their learning

¹⁹ Kollannoor and Thomas, "Exploring the Influence of Family Relationship on Students' School Well-Being."

²⁰ N Rath et al., "What Influences Indian Primary School Children's Food Behaviors? - Perceptions of Children, Mothers and Teachers," *BMC Public Health* 25, no. 1 (2025), <https://doi.org/10.1186/s12889-025-22660-0>.

²¹ J Chun et al., "Study on the Influence of Family Cultural Capital on Intellectual Support in the Context of Rural Revitalization—An Empirical Analysis Based on Rural Children's Reading Literacy," *Journal of Library Science in China* 51, no. 1 (2025): 101–15, <https://doi.org/10.13530/j.cnki.jlis.2025007>.

environments. This observation aligns with evidence that adolescent learning outcomes are sensitive to differences in family support, motivation, and access to resources. Such disparities are particularly salient in the digital era, where home conditions strongly influence how students engage with learning technologies. Therefore, descriptive patterns already point to the relevance of family-related factors in explaining outcome differences.

More importantly, the correlation analysis demonstrates a strong and statistically significant positive relationship between the family environment and learning outcomes. This result indicates that improvements in family conditions are closely associated with higher levels of student achievement. Comparable strong associations have been reported in studies emphasizing the role of family atmosphere and parent-child interaction in adolescent academic development. The magnitude of the correlation found here suggests that the family environment remains a central determinant even for digitally immersed students. Thus, technological advancement does not diminish the foundational role of the family in shaping learning behavior.

Beyond correlation, the regression results show that the family environment explains nearly half of the variance in learning outcomes, underscoring its predictive power. This level of contribution positions the family environment not merely as a contextual factor but as a primary explanatory variable. Similar proportions have been identified in studies linking family support and cultural capital to academic achievement across educational levels. The relatively high explanatory value may reflect the developmental stage of Grade XI students, who face increased academic pressure and future-oriented decision-making. Consequently, family guidance and emotional stability may exert a stronger influence at this stage.

When compared with previous findings, the results of this study largely support and extend existing empirical evidence. Prior research at lower educational levels often reported weaker relationships between family environment and achievement. In contrast, the stronger effect identified here suggests that the influence of family factors intensifies during late adolescence. This pattern is consistent with research showing that parental expectations, emotional support, and home learning norms

become increasingly salient as students approach critical educational transitions.²² Therefore, the present findings reinforce the importance of considering age and educational stage when interpreting family effects.

At the same time, the results resonate with international studies highlighting multidimensional family influences on academic and psychosocial outcomes. Family socioeconomic conditions and cultural practices have been shown to shape literacy, science curiosity, and critical thinking skills through both material and relational pathways. Likewise, positive parenting and family cohesion are associated with higher engagement, grit, and adaptive learning behaviors. The consistency between these studies and the present findings strengthens the argument that family influence operates across diverse cultural and educational contexts. However, it also suggests that the mechanisms of influence may be complex and interrelated.

From an explanatory perspective, the strong effect of the family environment may be understood through its role in shaping emotional security, learning discipline, and academic self-confidence. Supportive families provide structure, encouragement, and role modeling that help Generation Z students manage academic and digital demands. At the same time, access to learning resources and parental attitudes toward education influence how effectively students utilize technology for learning. Nevertheless, cautious interpretation is warranted because learning outcomes were measured through self-reported perceptions, which may amplify subjective evaluations. This limitation suggests that the observed relationships should be interpreted as perceived rather than purely objective effects.

Finally, the findings carry important implications for educational practice and policy. Strengthening school–family partnerships may enhance student learning by aligning expectations, communication, and support strategies. Programs that improve parental awareness of digital learning challenges can further support Generation Z students’ academic adaptation. At the policy level, family-centered educational interventions

²² S Miedijensky, “Insights into Gifted Development: The Influence of Childhood, Learning Environments, and Family from Gifted Adults Perspectives,” *Education Sciences* 15, no. 6 (2025), <https://doi.org/10.3390/educsci15060677>.

may help reduce achievement disparities linked to socioeconomic inequality.²³ Overall, the study underscores that fostering supportive family environments remains a critical pathway for improving learning outcomes in contemporary secondary education.

CONCLUSION

This study aimed to analyze the influence of the family environment on the learning outcomes of Generation Z students at SMA Negeri 1 Wuryantoro using a quantitative explanatory approach. The findings demonstrate that students generally perceive their family environments as supportive and their learning outcomes as relatively high, although with noticeable variation among individuals. Statistical analysis revealed a strong and positive relationship between the family environment and learning outcomes, indicating that improvements in family conditions are consistently associated with higher levels of perceived academic achievement. Furthermore, the regression results confirm that the family environment is a significant predictor, accounting for 48.7% of the variance in student learning outcomes, which underscores its substantial role in shaping academic development among Generation Z learners.

These results contribute meaningfully to the field of educational research by reinforcing the theoretical perspective that academic success is not solely determined by cognitive factors but is also strongly influenced by social and emotional contexts within the family. The study highlights that, even in the digital era where students are highly exposed to technology, the family remains a central and influential educational environment. Practically, the findings emphasize the importance of strengthening collaboration between schools and families, as well as encouraging parental involvement that supports emotional stability, learning discipline, and self-confidence among students. At a broader level, the study supports the relevance of family-centered educational strategies as an effective pathway for improving student learning outcomes and reducing disparities.

²³ K Ipinge and J Seroto, "The Influence of Ecological Systems on Primary School Learner Performance in Informal Settlements in Namibia," *SAGE Open* 14, no. 2 (2024), <https://doi.org/10.1177/21582440241247933>.

Despite its contributions, this study has several limitations that should be acknowledged. The research was conducted in a single school, which may limit the generalizability of the findings to other educational contexts. In addition, learning outcomes were measured based on students' self-perceptions rather than objective academic records, which may introduce subjectivity into the results. The model also did not include other potential predictors such as teacher quality, peer influence, or individual motivation, which may account for the remaining unexplained variance.

Future research is therefore recommended to involve multiple schools or regions to enhance external validity and to incorporate mixed methods or longitudinal designs for a deeper understanding of causal mechanisms. Subsequent studies could also integrate objective academic performance data and examine additional variables that interact with the family environment. Such efforts would further enrich the understanding of how family dynamics influence learning outcomes and provide stronger empirical foundations for educational interventions targeting Generation Z students.

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