

The Influence of Artificial Intelligence Utilization on School Financial Decision-Making Effectiveness

Sri Rahayu¹, Ken Sabardiman Soetjipto²

^{1,2}Department of Information and Communication Technology, Institut Teknologi & Bisnis Bina Sarana Global, Tangerang, Indonesia

Email: srirahayu@global.ac.id

This study aims to examine the influence of Artificial Intelligence (AI) utilization on the effectiveness of school financial decision-making at SMK Bina Mandiri. This research employed a quantitative associative approach involving 30 teachers as respondents, selected through a saturated sampling technique. Data were collected using a Likert-scale questionnaire and analyzed through validity testing, reliability testing, classical assumption testing, linear regression analysis, t-test, F-test, and the coefficient of determination (R^2) using SPSS. The results indicate that all statement items were valid and reliable, the residual data were normally distributed, and no heteroscedasticity was found. The regression equation obtained was $Y = 6.892 + 0.784X$, indicating that AI utilization has a positive effect on financial decision-making effectiveness. The t-test result ($t\text{-count } 5.921 > t\text{-table } 2.048$, sig. 0.000) confirms that H1 is accepted, while the F-test result ($F\text{-count } 35.058 > F\text{-table } 4.196$, sig. 0.000) confirms that the regression model is fit for use. The coefficient of determination (R^2) of 0.556 indicates that 55.6% of the variance in financial decision-making effectiveness is explained by AI utilization, while the remaining 44.4% is explained by other factors outside this research model. This study recommends that schools enhance AI training and literacy for teachers and staff involved in school financial management.

Keywords: Artificial Intelligence, Decision-Making, School Finance

This is an open access article under the [CC BY-NC](#) license



Corresponding Author:

Sri Rahayu

Institut Teknologi & Bisnis Bina Sarana Global

Jl. Aria Santika No.43, RT.005/RW.011, Margasari, Kec. Karawaci, Kota Tangerang, Banten 15113

srirahayu@global.ac.id

1. Introduction

The advancement of digital technology, particularly Artificial Intelligence (AI), has brought major changes across various sectors, including education. Educational institutions are increasingly expected not only to deliver high-quality learning but also to manage administrative and financial resources transparently, efficiently, and accountably. According to the UNESCO Global Education Monitoring Report, more than two-thirds of countries are actively integrating digital technologies into educational management systems, while AI-based applications are increasingly being adopted to support administrative decision-making and resource allocation. Furthermore, the 2025 McKinsey Global Survey on AI reports that approximately 78% of organizations worldwide have adopted AI in at least one business function, with finance, operations, and strategic planning among the fastest-growing areas of implementation. These findings indicate that AI has evolved beyond instructional support into a strategic technology capable of improving organizational decision-making through faster data processing, predictive analytics, and reduced human error [1], [2].

In Indonesia, the digital transformation of educational management has accelerated through the implementation of various technology-based systems, including the School Operational Assistance (BOS) information system, digital financial reporting, and electronic school management platforms. Nevertheless, financial decision-making in many schools remains highly dependent on manual analysis and individual

experience. Although administrative data are digitally recorded, the analytical process for budget planning, expenditure prioritization, and financial forecasting is still largely conducted using conventional methods. Consequently, school financial managers often encounter challenges related to lengthy decision-making processes, inconsistent data interpretation, and limited utilization of data-driven recommendations. These conditions suggest that the potential of AI to improve financial management has not yet been fully realized within the educational sector.

AI technologies are increasingly recognized as effective decision-support tools because of their ability to process large volumes of data rapidly, identify hidden patterns, generate predictive insights, and provide analytical recommendations for managerial decision-making. Previous studies have demonstrated that AI adoption contributes to improved organizational efficiency, better financial planning, and higher decision accuracy across various sectors. AI technologies are increasingly reshaping organizational processes and enhancing decision-making capacity within educational institutions [1]. Across sectors more broadly, organizations increasingly report that AI-based decision-support tools accelerate data analysis, reduce human error, and support more evidence-based managerial choices [2]. These advantages indicate that AI has considerable potential to strengthen school financial governance, particularly in budget planning, expenditure monitoring, and financial accountability.

SMK Bina Mandiri, as one of the vocational schools continuously striving to improve management quality, has begun utilizing several AI-based applications, including intelligent spreadsheet tools, AI-powered chatbots, and simple financial analytics systems to support budgeting and financial planning. However, the utilization of AI among teachers who serve as school treasurers, vice principals for finance, or members of the School Operational Assistance (BOS) fund management team remains relatively limited. Many financial decisions continue to rely on manual calculations and personal judgment rather than AI-assisted analysis. As a result, financial planning and budget allocation processes tend to be slower, more susceptible to human error, and less supported by comprehensive data analysis. This situation raises an important question regarding the extent to which AI utilization contributes to improving the effectiveness of school financial decision-making.

Although research on AI adoption and acceptance has expanded rapidly in recent years, a significant research gap remains. Previous studies have primarily investigated AI acceptance, behavioral intention, and technology adoption across sectors such as healthcare, e-commerce, customer service, and higher education without specifically examining financial decision-making within educational organizations [3]. Likewise, studies investigating AI-assisted financial decision-making have largely focused on banking, corporate finance, investment management, and fintech environments [4], while other studies have explored AI-supported decision-making from organizational behavior and psychological perspectives outside the education sector [5]. Within Indonesia, AI-related educational research has mainly concentrated on teachers' digital competence, digital leadership, technology readiness, and AI utilization in classroom instruction rather than teachers' administrative responsibilities in financial management [6]. Similarly, investigations of AI-assisted administrative systems have focused primarily on government institutions and public services instead of school-level financial governance [7]. Consequently, empirical evidence regarding the influence of AI utilization on the effectiveness of financial decision-making in vocational schools, particularly within the Indonesian educational context, remains very limited.

This study addresses this gap by empirically examining the influence of AI utilization on the effectiveness of school financial decision-making among teachers who are directly involved in financial management at SMK Bina Mandiri. The novelty of this research lies in its emphasis on AI utilization within school financial management, an area that has received considerably less scholarly attention than AI-supported teaching,

vocational learning, or teacher professional development [8], [9]. Using a quantitative associative research design with regression analysis, this study provides empirical evidence regarding the contribution of AI utilization to effective financial decision-making in vocational schools. The findings are expected to serve as a practical reference for policymakers and school administrators in designing AI literacy programs, strengthening digital financial governance, and promoting evidence-based financial management practices within educational institutions.

Based on these considerations, this study seeks to empirically investigate the influence of AI utilization on the effectiveness of school financial decision-making. Data were collected from 30 teachers at SMK Bina Mandiri who are directly or indirectly involved in school financial management. The findings are expected to contribute both theoretically, by expanding the literature on AI adoption in educational administration, and practically, by providing evidence that supports the development of AI-based financial management policies in schools.

2. Literature Review and Problem Statement

Artificial Intelligence Utilization

Artificial Intelligence (AI) refers to computer-based systems capable of simulating human intelligence in analyzing data, recognizing patterns, generating predictions, and supporting decision-making. In school financial management, AI can be utilized through financial analytics applications, intelligent spreadsheet tools, decision-support systems, and AI-powered chatbots that assist budgeting, financial reporting, and expenditure planning. This study is grounded in the Technology Acceptance Model (TAM), which explains that technology utilization is primarily influenced by perceived usefulness and perceived ease of use [10]. When users perceive AI as useful and easy to operate, they are more likely to integrate it into their work processes, thereby improving the efficiency and quality of managerial tasks. Empirical studies have consistently confirmed that these two factors remain the strongest predictors of AI utilization across various organizational contexts, including education [11]. Accordingly, AI utilization in this study is measured using five indicators: (1) intensity of AI use in work activities, (2) perceived ease of use, (3) perceived usefulness, (4) AI capability in supporting data analysis, and (5) AI support for budget projection and forecasting.

Financial Decision-Making Effectiveness

Financial decision-making effectiveness refers to the level of accuracy, speed, and accountability in the decision-making process related to the management of an organization's budget and financial resources, including schools. A financial decision is considered effective if it results in well-targeted resource allocation, is carried out quickly and responsively to needs, and can be accounted for transparently to stakeholders. In this study, the effectiveness of school financial decision-making is measured through the following indicators: (1) accuracy of budget decisions, (2) speed of the decision-making process, (3) transparency and accountability, (4) efficiency of fund allocation, and (5) satisfaction with the outcomes of decisions made. Studies on the application of AI technology in education indicate that this technology can support various managerial aspects, including data-driven decision-making [1]. From a technology-adoption perspective, the Technology Acceptance Model explains that perceived usefulness and perceived ease of use are key determinants of successful technology utilization within organizations, including educational organizations [10]. Systematic reviews of AI acceptance further show that these factors remain consistent across diverse sectors, from customer service to healthcare and organizational management [3]. Evidence from organizational-adoption studies also shows that AI diffusion within institutions is shaped by innovation-diffusion dynamics and organizational readiness rather than technical capability alone [12], and that perceived usefulness and perceived ease of use continue to significantly predict individual performance

outcomes once AI-supported systems are adopted [13]. In the financial domain, recent studies confirm that AI utilization has a significant effect on financial decision-making, whether directly or through mediating factors such as financial technology adoption [4]. Related technology-adoption frameworks, such as the Unified Theory of Acceptance and Use of Technology (UTAUT), have also been applied extensively to explain technology adoption in higher education [14] and, more recently, among K-12 educators [15]. Parallel research on data-driven decision-making in schools shows that leaders who systematically use data and analytics tend to make more effective and accountable decisions [16], [17]. These studies form the conceptual foundation that technology utilization, including AI, has the potential to influence the effectiveness of decision-making processes across various fields, including school financial management. However, as noted in the background, most of these studies have been conducted outside the school-finance context, underscoring the need for the present study to enrich this literature with more specific evidence from the educational sector, particularly at the vocational school level.

3. Method

This study employs a quantitative approach with a causal associative research design, which aims to examine the relationship and influence between variables. Specifically, this research is conducted to analyze the effect of Artificial Intelligence Utilization (X) on the effectiveness of school financial decision-making (Y). The research was conducted at SMK Bina Mandiri during the 2025/2026 academic year. The research location was selected based on the consideration that SMK Bina Mandiri has begun adopting AI-based technologies in several aspects of school management, including financial management processes.

The population in this study consisted of all teachers at SMK Bina Mandiri who are involved, either directly or indirectly, in school financial management and decision-making processes. The sampling technique used was saturated sampling (total sampling), in which all members of the population were selected as research samples [18]. Therefore, the total number of respondents involved in this study was 30 teachers. Data were collected using a closed-ended questionnaire with a five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). The questionnaire consisted of 10 statement items measuring the Artificial Intelligence Utilization variable (X) and 10 statement items measuring the Financial Decision-Making Effectiveness variable (Y). The instrument items were developed based on the indicators of each variable.

The collected data were analyzed using the Statistical Package for the Social Sciences (SPSS). The analysis process began with a validity test to assess the accuracy of each questionnaire item using the Pearson Product Moment correlation technique. An item was considered valid if the calculated r -value was greater than the r -table value ($n = 30$, $df = 28$, $\alpha = 5\%$, $r\text{-table} = 0.361$). A reliability test was then conducted to examine the internal consistency of the research instrument using Cronbach's Alpha coefficient. The instrument was considered reliable if the Cronbach's Alpha value was equal to or greater than 0.60. Furthermore, classical assumption tests were performed, including the normality test using the Kolmogorov-Smirnov method to determine whether the residual data followed a normal distribution and the heteroscedasticity test using the Glejser method to ensure that there was no unequal variance of residuals. The multicollinearity test was not conducted because this study only involved one independent variable (X).

Data analysis continued with linear regression analysis to determine the relationship and influence between Artificial Intelligence Utilization and Financial Decision-Making Effectiveness. Since this study consists of one independent variable and one dependent variable, the statistical model applied is simple linear regression. The regression analysis was further tested through hypothesis testing using the t -test and F -test. The t -test was used to examine the partial significance of the influence of Artificial Intelligence

Utilization on financial decision-making effectiveness by comparing the calculated t-value with the t-table value ($df = 28$, $\alpha = 5\%$, $t\text{-table} = 2.048$). Meanwhile, the F-test was conducted to evaluate the overall feasibility of the regression model by comparing the calculated F-value with the F-table value ($df_1 = 1$, $df_2 = 28$, $\alpha = 5\%$, $F\text{-table} = 4.196$). Finally, the coefficient of determination (R^2) was analyzed to determine the extent to which Artificial Intelligence Utilization contributes to explaining variations in the effectiveness of school financial decision-making. The value of R^2 indicates the proportion of changes in the dependent variable that can be explained by the independent variable within the proposed research model.

4. Results and Discussion

General Description of Respondents

Respondents in this study consisted of 30 teachers at SMK Bina Mandiri, with the following characteristics:

Table 1. Respondent Characteristics

Characteristic	Category	Frequency (f)	Percentage (%)
Gender	Male	12	40.0
	Female	18	60.0
Age	25–35 years	9	30.0
	36–45 years	14	46.7
	> 45 years	7	23.3
Length of Service	< 5 years	6	20.0
	5–10 years	13	43.3
	> 10 years	11	36.7
Total	-	30	100.0

Validity Test Results

The validity test was conducted by comparing the calculated r-value of each item with the table r-value (0.361). Based on the validity test results, all statement items for the Artificial Intelligence Utilization (X) and Financial Decision-Making Effectiveness (Y) variables produced calculated r-values ranging from 0.398 to 0.812, all of which exceed the table r-value of 0.361 ($n = 30$, $df = 28$, $\alpha = 5\%$). Accordingly, all 20 statement items for both variable X and variable Y are statistically declared valid, indicating that each item consistently measures its intended construct without any item requiring elimination or revision. The absence of invalid items suggests that the indicators developed from the theoretical review namely intensity of use, ease of use, and perceived usefulness for variable X, as well as accuracy, speed, transparency, efficiency, and satisfaction with decision outcomes for variable Y were operationalized appropriately into the questionnaire items. All statement items for variables X and Y have a calculated r-value greater than the table r-value (0.361), so all items are declared valid and suitable for use as research instruments, and can therefore be reliably carried forward to the subsequent stages of data analysis, namely the reliability test, classical assumption test, and linear regression analysis.

Reliability Test Results

Table 2. Reliability Test Results

Variable	Cronbach's Alpha	N of Items	Remarks
Artificial Intelligence Utilization (X)	0.887	10	Reliable
Financial Decision-Making Effectiveness (Y)	0.902	10	Reliable

Both variables have a Cronbach's Alpha value above 0.60, even falling into the very high category, so all research instruments are declared reliable and consistent for measuring the intended variables.

Classical Assumption Test Results

The classical assumption test conducted in this study consisted of a normality test and a heteroscedasticity test to ensure that the regression model met the basic requirements for valid statistical inference. The normality test, performed using the One-Sample Kolmogorov–Smirnov test, produced an Asymp. Sig. (2-tailed) value of 0.200, which is greater than the significance threshold of 0.05, indicating that the residual data in this study are normally distributed and therefore satisfy the assumption of normality required for regression analysis. In addition, the heteroscedasticity test, conducted using the Glejser method, yielded a significance value of 0.407 for the Artificial Intelligence Utilization variable (X), which is also greater than 0.05, indicating that there is no significant inequality of residual variance across observations and that the regression model is free from heteroscedasticity. Taken together, these results confirm that the residual data are both normally distributed and homoscedastic, meaning that the classical assumptions underlying linear regression have been adequately fulfilled and that the model is statistically appropriate for further use in testing the influence of AI utilization on the effectiveness of school financial decision-making.

Linear Regression Analysis Results

Table 3. Linear Regression Analysis Results (Coefficients)

Model	B	Std. Error	Beta	t	Sig.
(Constant)	6.892	3.145	-	2.192	0.037
AI Utilization (X)	0.784	0.132	0.746	5.921	0.000

Based on the table 3, the following regression equation was obtained: $Y = 6.892 + 0.784X$. The constant value of 6.892 indicates that if AI utilization (X) is 0, the effectiveness of school financial decision-making (Y) stands at 6.892. The regression coefficient of X, 0.784, indicates that every one-unit increase in AI utilization increases the effectiveness of school financial decision-making by 0.784 units, assuming other variables remain constant. Based on Table 3, the calculated t-value for the Artificial Intelligence Utilization variable (X) is 5.921 with a significance of 0.000. The calculated t-value (5.921) is greater than the table t-value (2.048), and the significance value (0.000) is less than 0.05. Thus, H_0 is rejected and H_1 is accepted, meaning that Artificial Intelligence utilization has a significant partial effect on the effectiveness of school financial decision-making at SMK Bina Mandiri.

Table 4. F-Test Results (ANOVA)

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	156.842	1	156.842	35.058	0.000
Residual	125.324	28	4.476		
Total	282.166	29			

The calculated F-value of 35.058 is greater than the table F-value (4.196), with a significance level of 0.000 (< 0.05). This indicates that the regression model in this study is fit for predicting the influence of Artificial Intelligence Utilization on Financial Decision-Making Effectiveness.

Table 5. Model Summary

R	R Square
0.746	0.556

The R Square value of 0.556 indicates that 55.6% of the variation in Financial Decision-Making Effectiveness (Y) can be explained by Artificial Intelligence Utilization (X), while the remaining 44.4% is explained by other variables or factors outside this research model, such as work experience, school policy, or budget availability.

Discussion

The results of this study indicate that Artificial Intelligence utilization has a positive and significant effect on the effectiveness of school financial decision-making at SMK Bina Mandiri. This finding is consistent with the Technology Acceptance Model, which states that the perceived usefulness of a technology encourages its users to utilize it more optimally in supporting work activities, including decision-making [10]. It also aligns with recent experimental evidence showing that generative AI tools can meaningfully increase the speed and quality of professional task completion once users perceive them as useful and easy to use [21].

The coefficient of determination of 55.6% indicates that AI has a fairly substantial contribution to improving the effectiveness of school financial decision-making, although 44.4% is still influenced by other factors, such as human resource competence, government budget regulations, or school organizational culture. Therefore, AI utilization needs to be balanced with improved teacher competence in using the technology so that the results of school financial decision-making can be further optimized, consistent with findings that organizational AI adoption is shaped as much by capability-building and diffusion dynamics as by the technology itself [12].

Practically, this finding indicates that SMK Bina Mandiri can continue to encourage the utilization of AI technology in the financial management process, for example through training in the use of data analytics applications, the provision of AI-based decision support systems, and the strengthening of digital literacy among teachers and education staff involved in school financial management. This is consistent with the broader gap identified in the literature: as AI-based decision support becomes more common in financial contexts outside education [4], schools stand to benefit from similarly structured, evidence-based approaches to strengthen financial governance. Moreover, because a large share of Indonesian school finances is administered through public funding schemes such as the School Operational Assistance (BOS) fund, strengthening AI-supported analysis could directly reinforce the accountability and transparency standards documented in prior BOS-management studies [22]–[25], particularly given that digital budgeting applications such as ARKAS have already been shown to improve transparency in school fund management when properly implemented [23].

5. Conclusion.

Based on the results of this study, several conclusions can be drawn. The level of Artificial Intelligence utilization by teachers at SMK Bina Mandiri is classified as good, as shown by the validity and reliability test results, all of which were declared valid and reliable. In addition, the level of effectiveness of school financial decision-making at SMK Bina Mandiri is classified as fairly good, as reflected in the indicators of accuracy, speed, transparency, efficiency, and satisfaction with decision outcomes. Furthermore, Artificial Intelligence utilization was found to have a positive and significant effect on the effectiveness of school financial decision-making at SMK Bina Mandiri, contributing 55.6% ($R^2 = 0.556$) to the variation in decision-making effectiveness, while the remaining 44.4% is explained by other factors outside this research model. Several recommendations are proposed. For the school, it is recommended to continue improving AI training and literacy for teachers and education staff involved in school financial management. For teachers, it is recommended to more actively utilize available AI technology to support faster, more accurate, and more accountable financial analysis and decision-making processes. For future researchers, it is recommended to incorporate other variables suspected of influencing the effectiveness of school financial decision-making, as well as to expand the number of respondents and research locations so that the results can be more broadly generalized.

6. References

- [1] L. Xue, J. Mahat, and N. Ghazali, "Technology acceptance model in artificial intelligence in education: A meta-analysis," *SAGE Open*, 2026.
- [2] E. Górka, D. Baran, G. Wojak, M. Ćwikła, S. Zupok, D. Starkowski, D. Reško, and O. Okrasa, "The impact of artificial intelligence on enterprise decision-making process," *arXiv preprint*, arXiv:2512.02048, 2025.
- [3] S. Kelly, S.-A. Kaye, and O. Oviedo-Trespalacios, "What factors contribute to the acceptance of artificial intelligence? A systematic review," *Telematics and Informatics*, vol. 77, Art. no. 101925, 2023. doi:10.1016/j.tele.2023.101925.
- [4] A. M. Qatawneh, A. Lutfi, and T. Al Barrak, "Effect of artificial intelligence (AI) on financial decision-making: Mediating role of financial technologies (Fin-Tech)," *HighTech and Innovation Journal*, vol. 5, no. 3, pp. 759–773, 2024. doi:10.28991/HIJ-2024-05-03-017.
- [5] A. Talamo, S. Marocco, and C. Tricol, "The flow in the funnel: Modeling organizational and individual decision-making for designing financial AI-based systems," *Frontiers in Psychology*, vol. 12, Art. no. 697101, 2021. doi:10.3389/fpsyg.2021.697101.
- [6] N. Sudibjo *et al.*, "Exploring Indonesian teachers' intention to use artificial intelligence in schools: The impact of digital leadership, digital readiness, and perceived usefulness," *Cogent Education*, vol. 12, 2025. doi:10.1080/2331186X.2025.2498574.
- [7] A. S. Rathnayake, T. D. H. N. Nguyen, and Y. Ahn, "Factors influencing AI chatbot adoption in government administration: A case study of Sri Lanka's digital government," *Administrative Sciences*, vol. 15, no. 5, Art. no. 157, 2025. doi:10.3390/admsci15050157.
- [8] S. Wahjusaputri, T. I. Nastiti, B. Bunyamin, and W. Sukmawati, "Development of artificial intelligence-based teaching factory in vocational high schools in Central Java Province," *Journal of Education and Learning (EduLearn)*, vol. 18, no. 4, pp. 1234–1245, 2024. doi:10.11591/edulearn.v18i4.21567.
- [9] A. Rulyansah, "Bridging the digital divide: Empowering teachers with AI tools in rural Indonesian schools," *Indonesia Berdaya*, 2025.
- [10] F. Ibrahim, J.-C. Münscher, M. Daseking, and N.-T. Telle, "The technology acceptance model and adopter type analysis in the context of artificial intelligence," *Frontiers in Artificial Intelligence*, vol. 7, Art. no. 1496518, 2025. doi:10.3389/frai.2025.1496518.
- [11] C. Wang, S. F. Ahmad, A. Y. A. Bani Ahmad Ayassrah, E. M. Awwad, M. Irshad, Y. A. Ali, M. Al-Razgan, Y. Khan, and H. Han, "An empirical evaluation of technology acceptance model for artificial intelligence in e-commerce," *Heliyon*, vol. 9, no. 8, Art. no. e18349, 2023. doi:10.1016/j.heliyon.2023.e18349.
- [12] G. G. Costa, F. Venier, and R. Pugliese, "Unveiling organizational AI adoption patterns in Italian companies through the lens of the diffusion of innovations theory," *Managing Global Transitions*, vol. 23, no. 1, pp. 65–90, 2025. doi:10.26493/1854-6935.23.65-90.
- [13] E. A. Anaam, S. C. Haw, N. Palanichamy, A. Ali, and S. Azni, "Analysis of perceived usefulness and perceived ease of use in relation to employee performance," *International Journal of Membrane Science and Technology*, vol. 10, no. 2, pp. 1607–1616, 2023. doi:10.15379/ijmst.v10i2.1776.
- [14] L. Xue, A. Mat Rashid, and S. Ouyang, "The unified theory of acceptance and use of technology (UTAUT) in higher education: A systematic review," *SAGE Open*, vol. 14, no. 1, 2024. doi:10.1177/21582440241229882.
- [15] L. Kittinger and V. Law, "A systematic review of the UTAUT and UTAUT2 among K-12 educators," *Journal of Information Technology Education: Research*, vol. 23, pp. 17–48, 2024. doi:10.28945/5268.
- [16] J. Fernandes, "The role of data-driven decision-making in effective educational leadership," *Academy of Educational Leadership Journal*, vol. 27, no. S2, pp. 1–3, 2023.

- [17] M. Öz and G. Arastaman, "School principals' opinions on data-based school management: A case study," *Participatory Educational Research*, vol. 9, no. 3, pp. 132–147, 2022.
- [18] M. M. Rahman, "Sample size determination for survey research and non-probability sampling techniques: A review and set of recommendations," *Journal of Entrepreneurship, Business and Economics*, vol. 11, no. 1, pp. 42–62, 2023.
- [19] Sugiyono, *Metode Penelitian Kuantitatif, Kualitatif, dan R&D*, Bandung, Indonesia: Alfabeta, 2022.
- [20] C. G. Park, "Implementing alternative estimation methods to evaluate the reliability of Likert-scale instruments," *Women's Health Nursing*, vol. 30, no. 1, 2024. doi:10.4069/whn.2024.03.15.