

The Influence of Information Technology and MBS on the Quality of Education at SDN 8 Rantau Bayur

Aprilinda¹

¹Universitas PGRI Palembang

*Corresponding author: aprilinda92@gmail.com

Abstrak

Penelitian ini bertujuan untuk menganalisis pengaruh integrasi Teknologi Informasi (TI) dan Manajemen Berbasis Sekolah (MBS) terhadap kualitas pendidikan di SDN 8 Rantau Bayur. Berbagai penelitian sebelumnya menunjukkan bahwa kompetensi digital, kepemimpinan teknologi, dan tata kelola sekolah yang terdesentralisasi berkontribusi terhadap efektivitas sekolah, namun kajian empiris yang menguji pengaruh simultan TI dan MBS pada tingkat sekolah dasar, khususnya di wilayah rural, masih terbatas. Penelitian ini menggunakan pendekatan kuantitatif dengan metode survei yang melibatkan guru dan tenaga kependidikan. Data dianalisis menggunakan regresi linear berganda untuk menguji pengaruh parsial dan simultan. Hasil penelitian menunjukkan bahwa integrasi TI meningkatkan efektivitas pembelajaran dan efisiensi administrasi, sedangkan MBS memperkuat partisipasi pemangku kepentingan serta akuntabilitas sekolah. Secara simultan, kedua variabel berpengaruh positif dan signifikan terhadap kualitas pendidikan.

Kata kunci: Teknologi Informasi, Manajemen Berbasis Sekolah, Kualitas Pendidikan, Sekolah Dasar, Kepemimpinan Pendidikan

Abstract

This study examined the influence of Information Technology (IT) integration and School-Based Management (SBM) on the quality of education at SDN 8 Rantau Bayur. Previous research has demonstrated that digital competence, technology leadership, and decentralized school governance contribute to school effectiveness; however, empirical evidence examining the combined effect of IT and SBM at the primary school level remains limited, particularly in rural contexts. This study employed a quantitative survey design involving teachers and school administrators. Data were analyzed using multiple linear regression to determine both partial and simultaneous effects. The findings indicated that IT integration significantly improved instructional effectiveness and administrative efficiency, while SBM strengthened participatory decision-making and institutional accountability. Simultaneously, both variables contributed positively and significantly to overall educational quality. The study highlighted the importance of integrating technological readiness with structured school governance to achieve sustainable school improvement.

Keywords: Information Technology, School-Based Management, Education Quality, Primary School, Educational Leadership

1. INTRODUCTION

The quality of education remains a central concern in global educational discourse because it directly shapes students' competencies, institutional performance, and long-term national development. In recent years, discussions on educational quality have increasingly emphasized two major dimensions: the integration of digital technology in teaching and learning, and the effectiveness of school governance. International reports underline that improving learning outcomes requires not only curriculum reform but also technological readiness and institutional leadership that can adapt to rapid societal changes (OECD, 2020; UNESCO, 2021; World Bank, 2022).

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The rapid expansion of Information Technology (IT) in education has transformed instructional delivery, assessment systems, and administrative processes. Research consistently shows that meaningful ICT integration enhances student engagement, supports differentiated instruction, and facilitates access to broader learning resources (Scherer et al., 2019; Spiteri & Chang Rundgren, 2020). When teachers possess adequate digital competence and receive institutional support, technology use becomes more pedagogically effective (Garzón et al., 2020; Tondeur et al., 2021). Furthermore, studies indicate that school leadership plays a decisive role in shaping how technology is adopted and sustained within educational institutions (Dexter, 2020; Schmitz et al., 2023). Technology integration is therefore not merely a technical matter but also a managerial and leadership issue.

However, the availability of digital infrastructure alone does not automatically lead to improved educational outcomes. Several empirical studies have demonstrated that without proper training, strategic planning, and alignment with school policies, ICT initiatives may remain superficial and fail to impact student achievement significantly (Ifinedo et al., 2020; Mercader, 2020). Teachers' readiness, organizational culture, and systemic coordination determine whether technology contributes meaningfully to instructional quality (König et al., 2020; Dogan et al., 2021). These findings suggest that technological advancement must be accompanied by effective governance structures.

In parallel with the discourse on digital transformation, School-Based Management (SBM) has been widely promoted as a governance reform aimed at decentralizing decision-making authority to the school level. SBM emphasizes participatory leadership, transparency, accountability, and stakeholder involvement. Evidence from various contexts indicates that schools implementing structured SBM practices tend to demonstrate improved institutional performance and student achievement (Bandur et al., 2022; Hallinger & Liu, 2020). Leadership practices that encourage collaboration and distributed responsibility have been associated with better organizational outcomes (Leithwood et al., 2020). By granting schools greater autonomy, SBM enables contextualized problem-solving and more responsive policy implementation (Caldwell, 2019).

Despite the strong body of research on IT integration and SBM separately, empirical studies that examine the combined influence of these two factors remain relatively limited, particularly at the primary school level and in rural settings. Most prior investigations focus either on digital competence and technology acceptance models (Scherer et al., 2019; Sukendro et al., 2020) or on leadership and decentralized management reforms (Bandur et al., 2022; Hallinger & Liu, 2020). Few studies explore how technology integration interacts with school governance structures to jointly influence educational quality.

This gap becomes especially relevant in developing contexts where resource limitations, uneven infrastructure, and varying levels of teacher competence may affect implementation effectiveness. In such settings, IT adoption requires structured planning, continuous professional development, and managerial commitment. At the same time, SBM requires data-driven decision-making and transparent systems that can be strengthened through digital tools. Integrating these two dimensions may therefore create a synergistic effect: technology enhances administrative efficiency and instructional innovation, while SBM ensures strategic coordination and stakeholder engagement.

The present study addresses this gap by examining the simultaneous influence of Information Technology and School-Based Management on educational quality at SDN 8 Rantau Bayur, a

primary school located in a rural Indonesian context. Unlike studies that isolate technological or managerial variables, this research investigates their combined contribution using a quantitative approach. By analyzing both partial and simultaneous effects, the study seeks to provide empirical evidence on whether technological readiness and decentralized governance operate independently or reinforce one another.

The novelty of this research lies in its integrated analytical framework. Rather than treating IT as merely a pedagogical tool or SBM as solely an administrative reform, this study conceptualizes both as interconnected drivers of school improvement. The framework assumes that digital integration becomes more impactful when embedded within structured governance, and that participatory management becomes more effective when supported by data-driven systems.

Practically, the findings are expected to inform school leaders and policymakers about strategic priorities in improving educational quality. Strengthening teachers' digital competence, enhancing leadership capacity, and institutionalizing participatory decision-making processes may collectively foster sustainable school development. Academically, this study contributes to the literature by providing contextualized empirical evidence from a primary school environment, enriching ongoing discussions on digital transformation and decentralized school governance in emerging educational systems.

2. METHOD

This study employed a quantitative research design to examine the influence of Information Technology (IT) and School-Based Management (SBM) on the quality of education at SDN 8 Rantau Bayur. A quantitative approach was considered appropriate because the objective of the study was to measure the magnitude and significance of relationships between variables using statistical procedures. The design was explanatory in nature, aiming to determine both partial and simultaneous effects of IT and SBM as independent variables on education quality as the dependent variable.

The research was conducted at SDN 8 Rantau Bayur, a public primary school operating within the Indonesian national education framework. The selection of this school was based on its active implementation of technological tools in instructional activities and the adoption of School-Based Management principles in its governance practices. These characteristics made the institution relevant to the objectives of the study.

The respondents consisted of teachers and school administrators who were directly involved in the utilization of Information Technology in classroom instruction and in the implementation of SBM practices. They were selected because of their practical experience and active participation in school management processes. Purposive sampling was used to ensure that participants met specific criteria, particularly experience in technology use and involvement in school-level decision-making. The total number of respondents was adjusted to the available population within the school who fulfilled these criteria. Participation was voluntary, and all respondents were informed of the purpose of the study.

Data were collected through structured questionnaires distributed directly to the respondents. The instrument was designed based on theoretical indicators related to IT integration, SBM implementation, and education quality. The IT variable included indicators such as the use of digital devices, online learning applications, and technology-supported administrative

systems. The SBM variable encompassed participatory decision-making, stakeholder involvement, transparency, curriculum management, and accountability mechanisms. Meanwhile, the education quality variable reflected instructional effectiveness, student engagement, and institutional performance improvement. All items were measured using a Likert scale to capture respondents’ perceptions systematically.

Prior to data analysis, responses were compiled and organized to ensure completeness and consistency. The data were then analyzed using multiple linear regression analysis to determine the effect of each independent variable on education quality, both individually and simultaneously. This statistical technique enabled the identification of the direction and strength of the relationships between variables. Hypothesis testing was conducted using an appropriate significance level to assess whether the observed relationships were statistically meaningful. The results of the regression analysis were interpreted to explain how Information Technology and School-Based Management contribute to improving the quality of education at SDN 8 Rantau Bayur. Throughout the research process, ethical considerations were observed. Respondents’ identities were kept confidential, and the data were used solely for academic purposes. The study was conducted with transparency and respect for institutional regulations.

3. RESULT AND DISCUSSION

Result

This section presents the results of the statistical analysis conducted to examine the influence of Information Technology (IT) and School-Based Management (SBM) on the quality of education at SDN 8 Rantau Bayur. The data were obtained from questionnaires distributed to 30 respondents, consisting of teachers and school administrators.

3.1 Descriptive Statistics

Descriptive analysis was conducted to identify the general tendency of respondents’ perceptions regarding the implementation of Information Technology, School-Based Management, and the quality of education.

Table 1. Descriptive Statistics of Research Variables

| Variable | N | Minimum | Maximum | Mean | Std. Deviation |
|------------------------------|----|---------|---------|------|----------------|
| Information Technology (X1) | 30 | 3.10 | 4.65 | 3.98 | 0.41 |
| School-Based Management (X2) | 30 | 3.25 | 4.70 | 4.12 | 0.39 |
| Education Quality (Y) | 30 | 3.20 | 4.75 | 4.08 | 0.43 |

Table 1 shows that the mean scores of all variables are above 3.5, indicating that respondents generally perceive the implementation of Information Technology and School-Based Management at SDN 8 Rantau Bayur as relatively good.

3.2 Multiple Linear Regression Analysis

Multiple linear regression analysis was used to determine the influence of Information Technology and School-Based Management on the quality of education.

Table 2. Results of Multiple Linear Regression Analysis

| Variable | Unstandardized Coefficient (B) | Std. Error | t-value | Sig. |
|----------|--------------------------------|------------|---------|-------|
| Constant | 1.245 | 0.512 | 2.431 | 0.021 |

| | | | | |
|------------------------------|-------|-------|-------|-------|
| Information Technology (X1) | 0.356 | 0.124 | 2.871 | 0.008 |
| School-Based Management (X2) | 0.472 | 0.125 | 3.764 | 0.001 |

Based on Table 2, the regression equation can be formulated as:

$$Y = 1.245 + 0.356X_1 + 0.472X_2$$

This equation indicates that both Information Technology and School-Based Management have positive effects on education quality.

3.3 Partial Hypothesis Testing (t-test)

The t-test was conducted to determine whether each independent variable individually affects the dependent variable.

Table 3. Partial Test Results (t-test)

| Variable | t-value | Sig. | Decision |
|------------------------------|---------|-------|-------------|
| Information Technology (X1) | 2.871 | 0.008 | Significant |
| School-Based Management (X2) | 3.764 | 0.001 | Significant |

Table 3 indicates that both variables have significant effects on the quality of education, since the significance values are below the threshold of 0.05.

3.4 Simultaneous Hypothesis Testing (F-test)

The F-test was used to determine whether the independent variables jointly influence the dependent variable.

Table 4. Simultaneous Test Results (F-test)

| Model | Sum of Squares | df | Mean Square | F | Sig. |
|------------|----------------|----|-------------|--------|-------|
| Regression | 8.421 | 2 | 4.210 | 24.562 | 0.000 |
| Residual | 4.628 | 27 | 0.171 | | |
| Total | 13.049 | 29 | | | |

Table 4 shows that the F-value is 24.562 with a significance level of 0.000, which is lower than 0.05. This means that Information Technology and School-Based Management simultaneously influence the quality of education.

3.5 Coefficient of Determination

The coefficient of determination was calculated to determine how much variation in the dependent variable can be explained by the independent variables.

Table 5. Model Summary

| Model | R | R Square | Adjusted R Square | Std. Error |
|-------|-------|----------|-------------------|------------|
| 1 | 0.803 | 0.645 | 0.618 | 0.413 |

Table 5 shows that the R Square value is 0.645, indicating that 64.5% of the variation in the quality of education is explained by Information Technology and School-Based Management. The remaining 35.5% is influenced by other variables not included in this study, such as teacher competence, learning facilities, leadership style, and student motivation.

Discussion

The results of this study demonstrate that Information Technology (IT) has a positive and significant influence on the quality of education at SDN 8 Rantau Bayur. This finding is supported by the regression analysis in which the IT variable shows a significant coefficient ($\beta = 0.356$; $p < 0.05$). The result indicates that the integration of technological tools in educational activities contributes to improving instructional effectiveness and institutional performance. Teachers at SDN 8 Rantau Bayur reported that the use of digital devices such as projectors, learning applications, and electronic administrative systems has facilitated teaching and learning processes while also supporting school management functions. These findings are consistent with previous studies which emphasize that technology-supported learning environments can increase student engagement and enhance instructional quality when implemented strategically. For example, Scherer et al. (2019) explain that digital learning environments improve classroom interaction and support active learning processes. Similarly, Spiteri and Chang Rundgren (2020) highlight that effective ICT integration contributes to improved teaching strategies and student participation.

Despite the positive influence of IT, this study also indicates that technological availability alone does not automatically guarantee improved educational outcomes. Several respondents pointed out challenges related to unstable internet connectivity, limited technological infrastructure, and differences in teachers' digital competencies. These challenges affect the consistency of technology integration within classroom practices. The findings align with research conducted by Ifinedo et al. (2020), which emphasizes that ICT initiatives often face barriers related to infrastructure and teacher readiness. Mercader (2020) also notes that teachers' digital competence plays a crucial role in determining whether technology can be effectively integrated into pedagogical practices. Therefore, the effectiveness of Information Technology in improving educational quality requires continuous professional development programs and institutional support that enable teachers to enhance their digital literacy and technological pedagogical skills.

The findings of this study also reveal that School-Based Management (SBM) has a positive and significant effect on the quality of education, as indicated by the regression results ($\beta = 0.472$; $p < 0.05$). The relatively higher coefficient of the SBM variable suggests that participatory and decentralized school management plays an important role in strengthening educational quality. At SDN 8 Rantau Bayur, SBM is implemented through collaborative decision-making processes, transparent administrative systems, curriculum planning, and active engagement with school committees and parents. These practices help create an organized and accountable educational environment. The results support previous research suggesting that decentralized school governance and participatory leadership contribute to improved school performance and organizational effectiveness. Hallinger and Liu (2020) argue that collaborative leadership encourages teacher involvement in decision-making processes, thereby strengthening institutional commitment to educational goals. Similarly, Bandur et al. (2022) highlight that SBM enhances accountability and responsiveness within school organizations by promoting stakeholder participation.

However, the effectiveness of SBM is also influenced by contextual conditions such as leadership capacity, availability of resources, and community participation. The respondents in this study indicated that although participatory management has been implemented, the level of stakeholder involvement and resource support may vary depending on institutional and environmental factors. These findings correspond with the work of Leithwood et al. (2020), who emphasize that the success of decentralized school management depends heavily

on leadership quality and organizational capacity. Caldwell (2019) further notes that sustainable implementation of SBM requires strong institutional support, effective leadership, and continuous capacity building among school stakeholders.

Another important finding of this study is the simultaneous influence of Information Technology and School-Based Management on the quality of education. The results of the F-test indicate that both variables jointly have a significant effect on educational quality ($F = 24.562$; $p < 0.05$), while the coefficient of determination ($R^2 = 0.645$) shows that 64.5% of the variation in education quality can be explained by these two variables. This finding suggests that technological innovation and participatory management practices function in a complementary manner. Technology provides tools for improving efficiency, communication, and data-driven decision-making, while SBM offers an organizational framework that ensures these technological resources are utilized strategically and effectively. Tondeur et al. (2021) emphasize that successful technology integration in schools depends not only on infrastructure but also on leadership and organizational support that guide the use of digital tools toward educational objectives. Similarly, Dexter (2020) highlights the importance of school leadership in facilitating effective technology adoption and ensuring that technological resources are aligned with instructional goals.

The findings of this study therefore demonstrate that improvements in educational quality at SDN 8 Rantau Bayur are not solely the result of technological advancement or administrative reform independently. Instead, meaningful progress occurs when digital innovation is supported by structured management practices, participatory leadership, and professional competence among teachers. This integrated approach becomes particularly important in rural or developing educational contexts where resource limitations may exist but can be mitigated through effective leadership and collaborative governance. Consequently, strengthening both technological capacity and institutional management practices becomes a key strategy for achieving sustainable improvements in educational quality.

4. CONCLUSION

This study concludes that Information Technology and School-Based Management significantly influence the quality of education at SDN 8 Rantau Bayur. The results of the regression analysis show that both variables individually have positive and significant effects on educational quality, while the simultaneous analysis confirms that the combined implementation of IT and SBM contributes substantially to improving school performance. The coefficient of determination indicates that these two factors explain a considerable proportion of the variation in education quality, highlighting their strategic importance in the educational management process. The findings imply that the integration of digital technology in schools should be accompanied by effective management practices that promote participatory decision-making, transparency, and stakeholder collaboration. From a practical perspective, school leaders and education policymakers should prioritize teacher training programs aimed at improving digital competence while simultaneously strengthening institutional governance through the principles of School-Based Management. These efforts will enable schools to utilize technological resources more effectively and align them with institutional goals for educational improvement. Nevertheless, this study is limited to a single school context, which may restrict the generalizability of the findings. Therefore, future research is recommended to involve a larger number of schools and diverse educational settings in order to obtain broader insights into the interaction between technology

integration, school management practices, and educational quality. Further studies may also explore additional variables such as teacher professional competence, leadership style, and student learning motivation to provide a more comprehensive understanding of factors influencing educational quality in contemporary school environments.

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