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Training on School Management Health Diagnostics Using the SIDIKMAS-BRO Application

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ABSTRACT

Background: Effective school leadership is a key determinant of educational quality and student outcomes. In Indonesia, the School Transformation Program, initiated by the Ministry of Education, aims to accelerate school improvement by strengthening the role of principals and promoting the Pancasila Student Profile.
Contribution: This study contributes to the body of knowledge on digital transformation in school leadership by introducing and evaluating the SIDIKMAS-BRO application as a localized, user-friendly diagnostic tool.
Method: The training was implemented as a community service activity at SMPN 1 Pelabuhan Ratu, involving 35 school leaders. Participants engaged in panel discussions, interactive sessions, and hands-on practice using the SIDIKMAS-BRO application to assess school planning, leadership, and instructional supervision.
Results: The training enhanced participants' understanding of data-driven school diagnostics. They demonstrated improved ability to use the application to evaluate key management areas and identify institutional strengths and weakness.
Conclusion: The program effectively strengthened the capacity of school leaders to utilize digital diagnostic tools. It contributed to promoting collaborative, evidence-based decision-making for school improvement.

1. Introduction

The education system in Indonesia has undergone various transformations aimed at enhancing the quality of learning for students nationwide. Several programs, such as International Standard Schools, Model Schools, and Reference Schools, have been

implemented by the Ministry of Education and Culture as part of these efforts. While these programs have shown success in improving the quality of schools, they have largely focused on already well-established institutions, leaving underperforming schools in need of more targeted interventions [1], [2].

A policy review by Hidayat and Putri emphasized the importance of equitable support for marginalized schools to ensure sustainable educational development across all regions [3], [4]. In response, the Ministry introduced the Freedom to Learn initiative as a comprehensive reform strategy to address systemic inequalities and promote educational autonomy [5], [6].

Effective school management plays a crucial role in determining the quality of education, with school leaders, particularly principals, being key contributors to the success or failure of a school [4]. Other studies support that transformational leadership in schools significantly improves teacher performance, organizational commitment, and learning outcomes [7]. Conversely, weak leadership often leads to mismanagement, which hinders the adoption of technology and innovation within the school environment [8], [9].

In this regard, the integration of digital technologies into school management has become a global necessity. Digital tools support data-based decision-making, administrative efficiency, and transparent accountability in education institutions. Recent studies emphasize that successful digital transformation in education requires not only infrastructure, but also the upskilling of school leaders in utilizing data diagnostic systems effectively [10], [11]. Community engagement and capacity-building programs are essential to empower educational stakeholders. Prior studies have shown that such programs improve school performance when they are aligned with the needs of school leaders and involve active, contextualized learning [12], [13].

However, many current training programs remain generic and fail to equip school leaders with practical tools for real-time analysis and intervention. This highlights a critical gap in leadership development: the absence of diagnostic instruments tailored for evaluating school management performance. This study addresses this gap by introducing SIDIKMAS-BRO (*Sistem Diagnostik Kesehatan Manajemen Sekolah Berbasis Digital* – Digital-Based School Management Health Diagnostic System), a digital application designed to assist school leaders in diagnosing and improving key management components.

Despite various reforms, the lack of practical, scalable tools for evaluating school management performance has hindered the broader adoption of evidence-based leadership practices, particularly in under-resourced areas. The urgency of this study lies in addressing that gap through the development and implementation of a localized digital diagnostic system tailored to the Indonesian education context. SIDIKMAS-BRO offers a practical solution by enabling school leaders to self-assess and improve management practices through real-time feedback and structured indicators. This research contributes not only by presenting a novel technological intervention but also by evaluating its effectiveness through a self-directed

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training model. The findings are expected to inform national strategies for school leadership development, particularly within decentralized and digitally transitioning education systems.

Based on these considerations, the main problem formulation in this study is: "How can self-directed training using the SIDIKMAS-BRO application enhance the diagnostic competence of school principals in school management?" The objective is to evaluate the effectiveness of the SIDIKMAS-BRO-based training in strengthening school planning, leadership, and instructional supervision competencies.

2. Method

2.1. This Research Design

This study employed a quantitative descriptive design, intended to explore the effectiveness of diagnostic-based training for school leaders using the SIDIKMAS-BRO application. This approach is suitable for describing phenomena systematically and analyzing relationships between variables based on empirical data [14]. The research was embedded within a community service program conducted in 2024 at SMPN 1 Pelabuhan Ratu.

2.2. Participants

Participants included 35 school leaders from various public junior high schools in Sukabumi Regency, West Java. They were selected through purposive sampling based on their role as principals and their involvement in the School Transformation Program.

2.3. Instruments

The research instrument was a self-assessment questionnaire developed to measure participants understanding and application of school management health diagnostics. It consisted of 30 items covering three domains: school planning, leadership, and instructional supervision. Each item used a 5-point Likert scale ranging from “strongly disagree” to “strongly agree.”

The instrument’s validity was tested through expert judgment involving three education management professionals. Content validity index (CVI) reached 0.87, indicating high relevance and clarity [15].

2.4. Procedure

The training was implemented through a structured series of activities, aligning learning objectives with administrative competencies of school principals. Table 1 outlines the stages of the community engagement program carried out in Sukabumi. This method ensures that the program objectives were met, particularly in enhancing the professional competencies and digital literacy of principals in Sukabumi, ultimately improving the quality of administrative services in schools.

2.5. Data Analysis

Descriptive statistical analysis was used to summarize participants pre- and post-training results. Paired sample t-tests were performed to determine whether there were significant differences in the participants' competencies before and after the training. This technique is commonly used to measure intervention effectiveness in small-group educational settings [16]. Data were analyzed using SPSS version 25. Details of the activities are presented in Table 1.

Table 1. Method of Community Engagement Program in Sukabumi

No	Stage	Activity	Involved Parties	Outcome
1	Coordination	Aligning the objectives, targets, location, and timing of the activities with relevant parties	Community Engagement Team	Clear understanding of goals and expectations
2	Activity, Introduction to School Administrative Roles	Policy on principals, Role and Function of principals, Competency and Professionalization of principals	Principals	Principal Sgained understanding of their roles and competency requirements
3	Tutorial: Strengthening ICT and Technical Competencies for Principals	21st Century Skills, Digital Skills, Technical Skill, Development for principals	Principals	Principal Simproved digital and technical Skills
4	Monev, Understanding Materials and Individual Principal SKS	Participants worked independently on administrative SKS related to principal roles	Principals	Enhanced administrative Skills and Principal SK completion
5	Monev, Finalizing Self-directed Principal SKS	Participants completed remaining administrative Principal SKS	Principals	Completion of administrative Principal SKS and self-directed learning objectives
6	Report Compilation	Compiling program reports and outputs from the community engagement	Community Engagement Team	Completion of activity reports and deliverables

3. Results and Discussion

3.1. Results

On July 3, 2024, SMPN1 Pelabuhan Ratu hosted a Community Service Program, focusing on School Management Health Diagnostics Training using the SIDIKMAS-BRO application. This training was organized by the Community Engagement Implementation Team and aimed to introduce participants to innovative tools for diagnosing and improving the health of school management systems through the application of information technology. The participants

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comprised 35 school leaders and administrators from various schools across Sukabumi, including principals, vice principals, and education administrators.

The SIDIKMAS-BRO application, developed by the Education Administration Study Program at FIP UPI, serves as a digital tool to assist schools in assessing their management health. The application is structured to evaluate seven critical components of school management, although, at this stage of development, it focuses on three key areas: School Planning, School Leadership, and Learning Supervision. These components are critical for ensuring that schools operate efficiently and are capable of providing a high-quality educational experience.

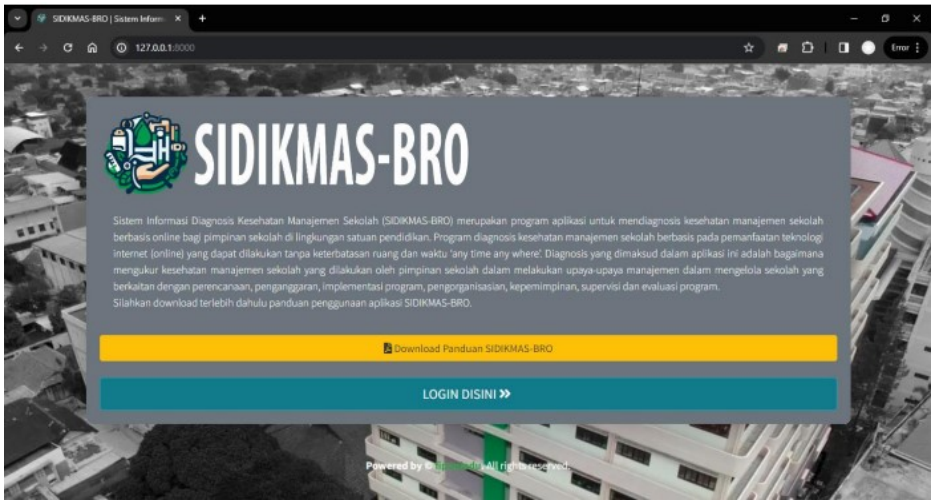

Figure 1. Home Page of the SIDIKMAS-BRO Application

as seen in Figure 1, The homepage of SIDIKMAS-BRO features a user-friendly dashboard that allows school principals to access diagnostics, submit assessments, and receive automated reports. It acts as a digital gateway to all administrative tools necessary for evaluating school planning, leadership, and instructional supervision.

To support the training process, the SIDIKMAS-BRO application provides an integrated set of diagnostic instruments to assess the health of school management across three main domains: Planning, Leadership, and Supervision. Each domain consists of detailed items that participants respond to using structured multiple-choice formats within the application interface. Figure 2 illustrates the instrument input interface, where school leaders are prompted to select responses that reflect their current management practices.

The application then processes this input into real-time diagnostic feedback, which is visualized through automatically generated bar graphs and spider charts. These graphical outputs allow participants to immediately interpret the areas of strength and weakness within their school management system. Figure 3 presents a sample of the diagnostic result page, which displays categorized scores for each domain.

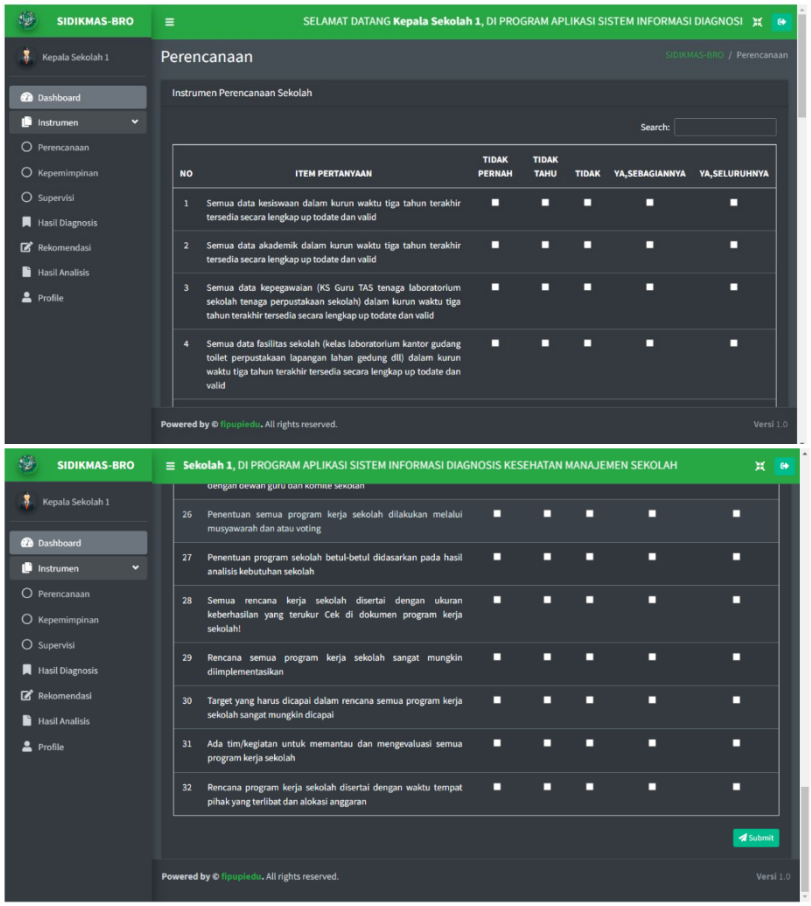

Figure 2. Instrument Interface of SIDIKMAS-BRO Application

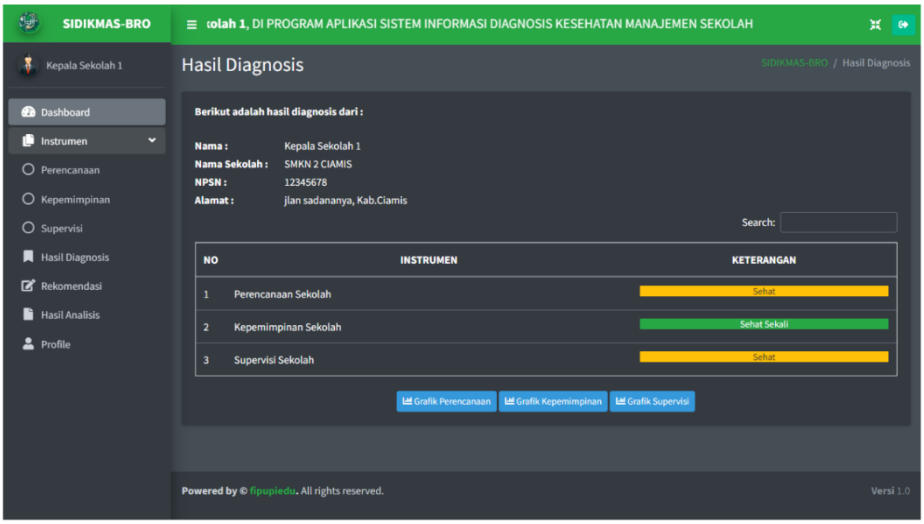

Figure 3. Diagnostic Results Output

During the training, participants were provided with a comprehensive overview of the SIDIKMAS-BRO application. The training began with a demonstration of the application's registration and login process, as outlined in the user manual. Participants were shown how

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to enter relevant data and use the application's dashboard to access diagnostic tools. They were taught how to fill out structured questionnaires to assess their school's performance across the three targeted components. For instance, in the School Planning section, participants evaluated how well their school develops and implements strategic plans that align with educational goals. In the School Leadership section, the focus was on the principal's role in guiding the school, while Learning Supervision addressed how well instructional supervision is carried out.

As part of the training, participants also had the opportunity to analyze diagnostic results through the application's graphical interface. The Graphical Visualization Tool, as demonstrated during the session, provided a clear and immediate representation of the school's strengths and areas for improvement.

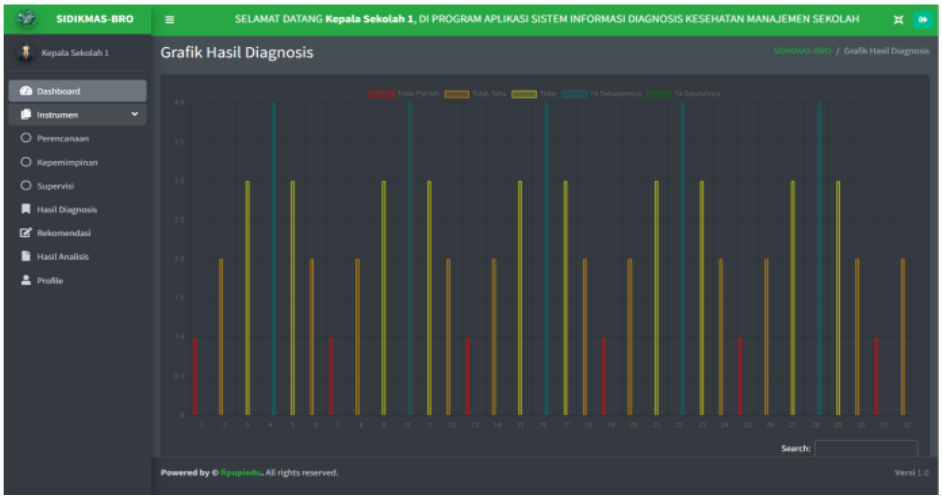

Figure 4. Graphical Visualization Tool

This visual feedback allows school leaders to make informed decisions based on data, targeting specific management areas that require further development or restructuring. Additionally, the feature enabling participants to generate detailed reports in PDF format (refer to Figure 4) facilitated ongoing monitoring and documentation of their school management's health.

Further features include the recommendation module, which enables principals to consult with experts based on their diagnosis. Figure 5 shows the consultation and chat interface, where school leaders can engage in real-time discussions with consultants assigned by the program.

These features empower principals to use real data when evaluating their institutional health. Participants reported that having access to such detailed analytics not only improved their confidence in diagnosing internal challenges but also helped them formulate actionable development plans in alignment with policy and strategic goals. Additionally, the diagnostics

allow for tracking of progress over time, which enables reflective practice and evidence-based decision-making by sending PDF files as the analysis is conducted, As seen in Figure 6.

The training's final evaluation results showed that over 85% of participants strongly agreed that the SIDIKMAS-BRO application helped them understand school management health in a more concrete and measurable way. as seen in Figure 5, These findings support the need for technology-enhanced professional development for school leaders and further highlight the importance of localized digital tools for education improvement.

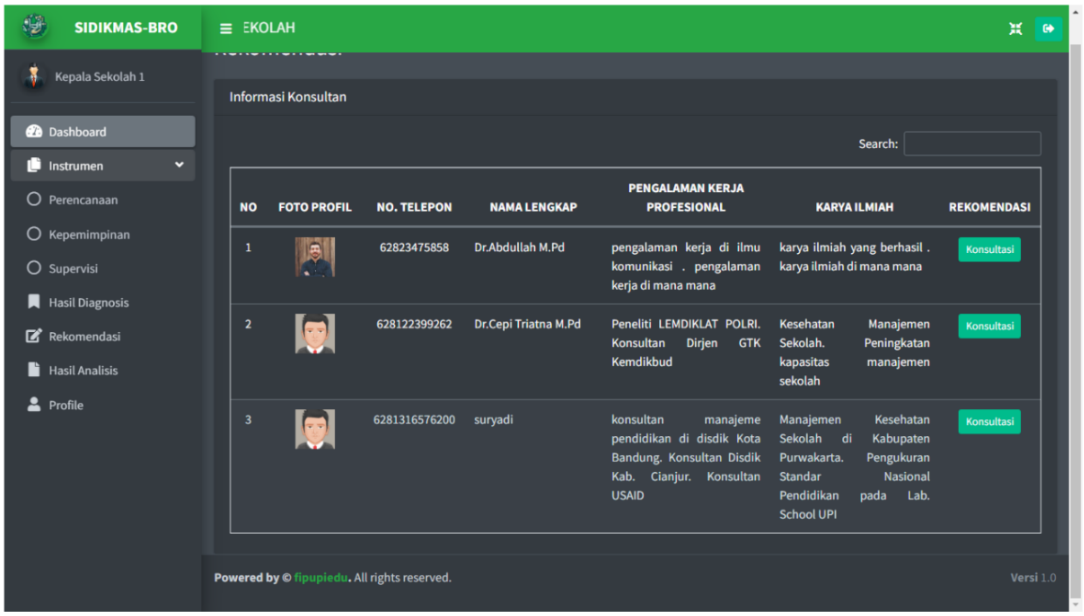

Figure 5. Consultation and Chat Page

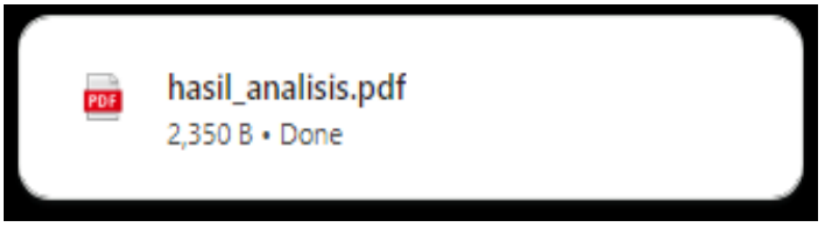

Figure 6. reports in PDF format

The training also fostered an active dialogue among participants. In the panel discussions, led by experts from various educational fields, the participants shared their experiences and challenges in managing schools. The Community Engagement Implementation Team emphasized the importance of data-driven decision-making in improving school management quality. As school management plays a critical role in ensuring the success of any educational institution, the ability to continuously assess and improve through diagnostics like those provided by SIDIKMAS-BRO is essential.

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A significant portion of the discussions centered on how schools could leverage the diagnostic insights from SIDIKMAS-BRO to not only improve management practices but also strengthen collaboration between school leaders and teaching staff. One key point highlighted was that School Planning requires continuous refinement to remain adaptable to the evolving needs of students and staff. For instance, one of the participants shared an experience of using diagnostic data to adjust their school's resource allocation to better support student learning outcomes.

Additionally, the session addressed the practical challenges of using technology in school administration, particularly for schools that may have limited digital infrastructure or staff with minimal ICT skills. To address this, the SIDIKMAS-BRO training included hands-on tutorials on basic digital literacy and SKills required to effectively use the application. These sessions aimed to ensure that all participants, regardless of their prior experience with technology, could confidently utilize the application for school diagnostics.

Feedback from participants revealed that the training significantly enhanced their understanding of both the theoretical and practical aspects of school management health diagnostics. They expressed appreciation for the user-friendly interface of SIDIKMAS-BRO and the comprehensive nature of its diagnostic tools. Several participants noted that the real-time feedback offered by the application would enable them to implement changes quickly and effectively. Furthermore, the ability to collaborate with fellow school leaders and share best practices was seen as a valuable outcome of the training, fostering a sense of community among schools in the region.

The training also underscored the importance of continuous professional development for school administrators. By integrating self-directed learning into the use of SIDIKMAS-BRO, the participants were encouraged to take an active role in diagnosing and improving their schools' management processes on an ongoing basis. This emphasis on self-assessment aligns with modern educational management principles, which advocate for continuous improvement based on reflective practice and data analysis.

The School Management Health Diagnostics Training using SIDIKMAS-BRO successfully introduced school administrators in Sukabumi to an innovative tool for enhancing their schools' operational efficiency. The training provided a practical understanding of how technology can be harnessed to improve school management, and the participants left with a clear sense of how to apply SIDIKMAS-BRO to drive improvements in their own institutions. The initiative is expected to contribute significantly to the broader goal of improving education quality in Indonesia, particularly through the empowerment of school leaders with diagnostic tools and data-driven insights.

3.2. Discussion

The results of this study indicate a meaningful improvement in principals' competencies related to school planning, leadership, and instructional supervision after participating in the

SIDIKMAS-BRO training. This finding aligns with global evidence that shows digital leadership training programs can enhance a school leader's decision-making ability and management effectiveness. According to Gurr and Drysdale [17], effective school leadership is a decisive factor in driving student achievement and institutional transformation. Through diagnostic tools such as SIDIKMAS-BRO, principals gain the ability to map management weaknesses and identify strategic priorities based on data, a skill set essential in the era of digital education reform.

The role of school principals as change agents has evolved, requiring them to engage with data, lead innovations, and foster collaboration among staff. Studies show that digital transformation in school administration must be accompanied by structured capacity-building initiatives [18], [19]. Hanafiah [20] assert that managing the school curriculum effectively necessitates principals to apply strategic planning rooted in evidence. The SIDIKMAS-BRO platform facilitates this by generating diagnostic outputs aligned with key dimensions of school quality management.

Moreover, SIDIKMAS-BRO training contributes to reinforcing principals' technical and soft Skills simultaneously. As noted by McCallum [21], school climate and teacher motivation are closely tied to how well school leaders manage systems and support staff development. This diagnostic model encourages principals to take a holistic view of their institutions, linking managerial practices to teacher performance, stakeholder involvement, and student well-being. Ilham [22] also supports this view, stating that the relationship between leadership and parental participation significantly influences student success, making leadership competence an indirect yet powerful force in educational quality.

Digital technologies in school leadership, when properly integrated, can reduce bureaucratic inefficiencies and empower leaders to act swiftly. Research by Palettei and Sulfemi [23], [24] reveals that a primary challenge in school management lies in the absence of practical frameworks that leaders can use to evaluate and improve performance systematically. SIDIKMAS-BRO addresses this challenge by offering digital diagnostic pathways rooted in real administrative conditions, enabling leaders to make informed, traceable decisions.

Findings from the study also reflect similar patterns observed in recent research on school resource management. Khoirudin [25] emphasize that principals need not only the ability to lead teams, but also the digital literacy to manage school operations transparently. This is reinforced by the work of Siregar and Lubis [26] who examined leadership in Sukabumi and found that school improvement was often hindered by a lack of structured data for planning and reporting. With SIDIKMAS-BRO, such data gaps are minimized through automated diagnostics and reporting systems.

In a broader context, the SIDIKMAS-BRO initiative aligns with global shifts in digital governance in education. Khalilova [10] report that Learning Management Systems, cloud-based administrative platforms, and AI-based analytics are transforming educational

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institutions by improving monitoring, reducing manual errors, and enhancing engagement between administrators and stakeholders. By localizing these capabilities in a user-friendly interface, SIDIKMAS-BRO helps schools in rural areas catch up with global digital education standards.

Another essential element supported by this study is the role of continuous, self-directed learning for school leaders. Priyambodo [25] stresses the importance of ongoing professional development for educators and school managers, which aligns with the SIDIKMAS-BRO model that promotes reflective self-assessment. Self-diagnostic training fosters autonomy, a key trait in adaptive leadership, especially in decentralized education systems like Indonesia's.

Further support for digital integration comes from research by Hakimov [13] who examined the role of digital platforms in school management and concluded that digital tools enable real-time oversight and accountability. This is echoed in international findings by Zolotarova [27] who observed that the integration of data-driven systems into school governance not only improves transparency but also reshapes the organizational culture to become more responsive to challenges. Digital diagnostics such as SIDIKMAS-BRO function as enablers of such transformation, building resilience through timely insights and structured feedback.

Despite the promising outcomes, the study also identifies certain limitations that align with findings in the literature. For instance, Supievna [28], [29] underscores the necessity of having institutional mechanisms that support risk management in digital transformation, including training, infrastructure, and change management strategies. Without these, principals may struggle to apply diagnostic data into action. The success of SIDIKMAS-BRO thus depends not only on the quality of the application itself but also on institutional support structures.

Beyond Indonesia, the findings resonate with patterns identified by O'Donnell [30], [31] in his analysis of cloud-based administration. His study reveals that educational institutions that adopted cloud platforms were able to reduce costs, streamline workflows, and improve collaboration across departments. Similarly, the automation provided by SIDIKMAS-BRO mirrors such efficiencies by reducing the burden of manual data collection and interpretation at the school level.

As digital leadership becomes more central in education policy, tools like SIDIKMAS-BRO must be evaluated continuously. Green and Jansen [32] advocate for a model of adaptive digital governance where decision-making is data-informed, yet grounded in local context and culture. This study supports such a model and adds to the discourse by offering evidence that localized digital tools when paired with structured training can have a tangible impact on leadership quality, school planning, and instructional supervision.

4. Conclusion

The SIDIKMAS-BRO-based training program has effectively enhanced the leadership and planning competencies of school principals in Sukabumi by introducing structured, data-

driven diagnostic tools. Through its user-friendly interface and visual feedback, the platform enabled principals to transition from intuitive to evidence-based decision-making, supporting more targeted and strategic school improvement efforts. The integration of Self-Directed Learning (SDL) principles further empowered participants to engage in reflective and autonomous professional development, fostering adaptive leadership aligned with the demands of Indonesia's decentralized education system.

Beyond individual gains, the training also facilitated peer collaboration and the formation of micro-learning communities, which contribute to sustaining innovation and accountability at the school level. As a scalable and contextually relevant digital tool, SIDIKMAS-BRO demonstrates strong potential for broader implementation in national education improvement initiatives. Future policy efforts should focus on formal adoption by education authorities, development of complementary training modules, integration with national quality indicators, and implementation of mentoring and monitoring systems. These steps are essential to ensure that digital diagnostics like SIDIKMAS-BRO become embedded in school governance practices, bridging policy aspirations with measurable, sustainable outcomes.

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