INTERNATIONAL JOURNAL OF SOCIAL SCIENCE, EDUCATIONAL, ECONOMICS, AGRICULTURE RESEARCH AND TECHNOLOGY (IJSET) | ISSN (E): 2827-766X
Website: https://ijset.org/ | Volume 5 No. 12 (2026)

PRINCIPAL MANAGEMENT STRATEGIES FOR IMPROVING TEACHERS' DIGITAL LITERACY AT SMP NEGERI 2 SAMBOJA

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Received: 07/08/2026 | **Revised:** 20/09/2026 | **Accepted:** 12/10/2026 | **Published:** 26/11/2026

Abstract

Technology-based learning requires teachers to possess adequate digital literacy, yet digital competence in peripheral schools remains uneven and constrained by devices and internet connectivity. This study examines how the principal of SMP Negeri 2 Samboja, Kutai Kartanegara Regency, plans, organizes, implements, and supervises efforts to improve teachers' digital literacy, including supporting and inhibiting factors. A descriptive qualitative single-case design was used. Data were collected through in-depth interviews with the principal and literacy coordinator, a structured Google Form questionnaire, and document analysis. Data were analyzed using the Miles, Huberman, and Saldaña interactive model and verified through source and technique triangulation. The findings show data-driven planning through the Education Report Card, PMM activity, and needs questionnaires; competence-based organizing through an implementation team, peer tutors, and in-house training; integration into daily teaching through principal role modelling, rewards, and peer coaching; and tiered supervision through weekly monitoring and semester clinical supervision. Peer support, facilities, BOS funding, and principal commitment enabled the program, while unstable connectivity, resistance, limited budgets, and administrative workload constrained it. The study proposes a data-driven, peer-collaborative management cycle for teacher digital literacy.

Keywords: learning community; management strategy; principal; school management; teachers' digital literacy.

INTRODUCTION

Digital transformation has changed how teachers plan, deliver, and assess learning. Digital literacy has therefore become a key teacher competency, referring to the ability to find, evaluate, manage, and use digital information critically and ethically (Khotimah & Reza, 2022; Ningsih et al., 2021). Teachers with low digital literacy risk being unable to meet the learning needs of a generation that increasingly relies on technology (Wiguna, 2023). Training and mentoring in the use of Learning Management Systems (LMS) have been shown to improve teachers' digital skills (Ratnaningsih et al., 2025), while the Merdeka Curriculum positions digital literacy as part of efforts to prepare Indonesia's Golden Generation 2045 (Susandi et al., 2025).

National policies such as the National Assessment require teachers to integrate technology into lesson planning, implementation, and assessment (Utari et al., 2023). In practice, many teachers still use technology mainly for presentations or simple administrative tasks (Hermila & Bau, 2023). Teachers' understanding of assessment policy is also uneven; Rokhim et al. (2021) reported that approximately 25% of teachers had not fully understood the National Assessment. This gap is more pronounced in peripheral schools, where devices, connectivity, and training opportunities are limited.

SMP Negeri 2 Samboja in Kutai Kartanegara Regency illustrates this condition. The school has a computer laboratory, Chromebooks, projectors, and internet access, but the extent to which teachers use these resources varies. Some teachers use digital devices to present materials, access learning resources, and communicate with students, while others remain less confident in using more complex technologies and continue to rely on lectures and

textbooks. Teachers have participated in training programs, learning communities, and government digital platforms, but the effects have not been equally visible across classrooms.

The principal occupies a strategic position in bridging this gap. As a manager, the principal performs planning, organizing, actuating, and controlling functions in relation to school resources (Terry, 1977; Wakila, 2021). As a digital leader, the principal is expected to provide a vision and model the effective use of technology (Muslim, 2021). Previous studies indicate that principal-led programs can improve teachers' ability to use information technology and strengthen digital literacy (Erwani et al., 2023). Principal digital leadership also influences teachers' technology integration, although teacher digital competence and school infrastructure remain important constraints (Sinaga et al., 2024; Kasim & Surya, 2025). Rasdiana et al. (2024) found that digital leadership strengthens teachers' innovation skills through professional learning communities rather than through a direct pathway (Panjaitan et al., 2026).

These studies generally measure the influence of leadership on teacher competence, but relatively few have mapped in detail how principals in peripheral junior high schools perform each management function within teacher digital literacy programs and how they address the accompanying constraints. This study therefore aims to describe: (1) planning, (2) organizing, (3) implementation or direction, and (4) supervision by the principal in improving teachers' digital literacy, as well as (5) the supporting and inhibiting factors at SMP Negeri 2 Samboja. The article contributes a teacher digital literacy management cycle that is grounded in needs data and driven by peer collaboration, offering a practical reference for schools operating in similar contexts.

LITERATURE REVIEW

Educational management is understood as the science and art of managing human and non-human resources through management principles and functions to achieve educational goals effectively and efficiently (Nugraha, 2023; Sinurat et al., 2026). Terry (1977) formulated four core management functions: planning, organizing, actuating, and controlling (POAC). Planning determines objectives and the steps required to achieve them; organizing arranges roles, responsibilities, and work structures; actuating encourages organizational members to work toward shared objectives; and controlling monitors, assesses, and corrects implementation so that it remains aligned with the plan (Wakila, 2021; Asmadi et al., 2022). These four functions operate as an interconnected cycle rather than as independent stages.

Within this managerial role, the principal functions as a planner, motivator, facilitator, and supervisor. Principals who act as facilitators through training and collaboration can positively influence teachers' commitment and performance (Wati et al., 2022; Sari et al., 2021). Educational supervision provides a mechanism for evaluating the performance of teachers and education personnel (Mubarika et al., 2023), while cooperation between principals and school quality assurance teams strengthens the school quality management cycle (Kamaruddin et al., 2021). In the digital era, this role has developed into digital leadership, namely the principal's ability to build a vision, culture, and support system for technology use (Muslim, 2021; Margana et al., 2024; Saragih et al., 2024; Mei et al., 2026). Berkovich and Hassan (2022) showed that principals' digital instructional leadership is associated with student learning through teachers' intrinsic motivation for digital teaching.

Digital literacy was initially defined as the ability to understand and use information presented through computers in various formats and from diverse sources (Gilster, 1997). Ng (2012) expanded the concept into three intersecting dimensions: technical, cognitive, and socio-emotional. For teachers, digital literacy extends beyond operating devices and includes the ability to design instructional media, manage learning platforms, critically evaluate information, and use technology ethically (Khotimah & Reza, 2022; Wiguna, 2023). The POAC framework and the concept of digital literacy therefore serve as the analytical lenses for this study.

METHOD

This study employed a descriptive qualitative approach using a single-case study method (Yin, 2018). The approach was selected to obtain an in-depth understanding of how the principal performs management functions within the school's natural setting. The study was conducted at SMP Negeri 2 Samboja, Amborawang Darat Village, Samboja District, Kutai Kartanegara Regency, East Kalimantan, during the 2025/2026 academic year. The school is a public institution with B accreditation, serves 241 students in nine study groups, and has a computer laboratory, science laboratory, and library.

Informants were selected purposively based on their direct involvement in the teacher digital literacy program. Data sources and collection techniques are presented in Table 1. Interview quotations were coded KS for the principal and KL for the literacy coordinator, followed by the relevant item number in the interview guide (for

example, KS.05). The interview guide was developed around the four management functions and included indicators of needs identification, program selection, resource provision, anticipation of constraints, task allocation, coordination, communication of responsibilities, initial training, implementation, motivation, monitoring, management of obstacles, evaluation indicators, and follow-up actions.

Table 1. Data Sources and Data Collection Techniques

Data Source	Technique	Information Focus
Principal (KS)	In-depth interview	Planning, organizing, implementation, supervision, and supporting and inhibiting factors in the digital literacy program
Literacy coordinator / appointed teacher (KL)	In-depth interview	Needs-identification methods, program implementation, constraints, and the role of peers
Teachers	Structured questionnaire (Google Form)	Supporting data on needs and implementation of the digital literacy program
School documents	Document analysis	School profile, monthly reports, Implementation Team decree, literacy program, and supervision instruments

Source: Research data, 2025

Data were analyzed using the interactive model of Miles et al. (2014), which consists of data condensation, data display, and conclusion drawing and verification. Data condensation involved selecting and coding information according to the management functions; data were displayed in narratives, quotations, and matrices; and conclusions were verified by comparing evidence across sources. Trustworthiness was maintained through the criteria of credibility, transferability, dependability, and confirmability (Lincoln & Guba, 1985), particularly through source and technique triangulation, detailed contextual description, and an audit of the research process with the supervisory team.

RESULTS AND DISCUSSION

Data-Driven Needs Planning

The principal began the planning process by identifying teachers' digital literacy needs. Needs identification was conducted through direct observation and staff meetings in which teachers described the learning constraints they encountered.

> *"Through observation or by directly seeing conditions in the field, and because the current era requires us to become familiar with the digital world. During meetings, each teacher explains the difficulties they experience in teaching." (KS.01)*

The principal did not rely solely on personal observation. Information sources included the school's Education Report Card, teachers' activity on the Merdeka Mengajar Platform (PMM), actual problems reported by teachers, and a needs-analysis questionnaire. The literacy coordinator confirmed the use of these multiple methods:

> *"The methods used include a needs-analysis questionnaire through Google Forms, teacher self-evaluation and analysis of the school Education Report Card, classroom observation and supervision, and in-depth interviews." (KL.02)*

The needs assessment was translated into major work programs: workshops on the use of Artificial Intelligence (AI) and Canva, mentoring in the use of PMM, and the establishment of a digital Learning Community (Komunitas Belajar, Kombel). Priorities were set according to their direct impact on students. The ability to create engaging instructional media was placed first, followed by digital administrative skills (KS.06). The program was designed across two time horizons. Short-term activities focused on presentation applications, the creation of digital quizzes through Google Forms or Quizizz, and completion of action-based tasks on PMM. Long-term activities aimed at full digitization of school administration and sustainable use of technology. Teachers were involved in the school development team to prepare schedules, select workshop topics, and nominate technologically proficient colleagues as peer tutors.

In terms of resources, the principal prepared hardware such as laptops, Chromebooks, and tablets, internet connectivity, digital content, and technical teams and instructors. Adequacy was assessed through asset mapping that compared the number of teachers with device ratios and network capacity. Budget constraints were addressed through phased procurement, the use of School Operational Assistance (BOS) funds in accordance with regulations, and

cooperation with external parties (KS.11). The principal also anticipated resistance from senior teachers, conflicts between training schedules and teaching activities, and infrastructure instability through persuasive communication, flexible online and face-to-face schedules, and small-scale trials involving the school committee, supervisory officers, and the ICT coordinator.

These findings indicate the application of data-driven planning. Consistent with the planning function in Terry's (1977) framework, program objectives and steps were determined on the basis of evidence rather than assumptions. This pattern is consistent with Erwani et al. (2023), who found that principal-led programs effectively improved teachers' information technology skills and digital literacy. Teacher involvement in the school development team fostered program ownership, while the use of short- and long-term horizons reflected the sustainability orientation needed by principals to respond to school quality challenges in the digital era (Margana et al., 2024).

Competence-Based Collaborative Organizing

The principal divided responsibilities clearly. Teachers acted both as learners and classroom implementers, while administrative staff provided administrative and technical support. Assignments were based on information technology competence, self-motivation, teaching experience, and existing workload.

> *"Teachers are both learners and implementers in the classroom, while administrative staff provide administrative and technical support. The criteria are IT competence, self-motivation, teaching experience, and the existing workload so that responsibilities remain proportional." (KS.17)*

Task allocation was agreed through deliberation in official staff meetings and formalized through a decree establishing the Implementation Team. The team involved the principal, vice principals responsible for curriculum and facilities, teachers, and education personnel. Coordination took place through regular meetings, the empowerment of colleagues as facilitators, and optimization of the Learning Community. Team communication used a dedicated WhatsApp group, task-management applications, and weekly face-to-face meetings, with team performance evaluated once a month (KS.22). Conflicts were addressed through individual persuasive approaches, mediation, and reference to formal duties, functions, and the program's original objectives.

Each member's responsibilities were communicated through verbal and written job descriptions incorporated into Standard Operating Procedures (SOPs). Program expectations were communicated through plenary meetings and motivational messages in internal school media. Members who did not yet understand their roles were supported through question-and-answer sessions and an open-door policy. Before implementation, the principal organized In-House Training (IHT) covering digital security, the use of AI for learning, educational content creation, and digital communication ethics. Training needs were assessed through self-assessment surveys and academic supervision results, and external speakers were invited from training centers and practitioner communities.

This arrangement reflects the organizing function, namely the structuring of roles and responsibilities so that each individual understands their tasks (Wakila, 2021). The Implementation Team decree provided formal legitimacy, while the use of peer tutors and the Learning Community transformed the formal structure into a collaborative ecosystem. This finding is consistent with Rasdiana et al. (2024), who showed that principal digital leadership improves teachers' innovation skills by strengthening professional learning communities. In this case, the Learning Community became the main channel through which the principal's direction was translated into improved teacher competence.

Integrated Implementation and Human-Centered Direction

The digital literacy program was project-based and integrated into daily teaching and learning rather than implemented as a separate activity. The implementation stages followed a sequenced process and referred to national guidance:

> *"The stages are socialization, training, focused independent practice, classroom integration, and dissemination to others. They refer to the National Digital Literacy Guide and the curriculum as adapted by the school." (KS.34)*

The principal was actively involved as a facilitator, monitor, and participant who modelled the use of technology. To encourage participation, the principal gave public recognition, opened opportunities for career development, created a healthy competitive climate, and provided rewards such as certificates, points in the Employee Performance Targets (SKP), or additional work facilities (KS.37). Less-motivated teachers were supported by colleagues through peer coaching so that they would not feel intimidated by technology, accompanied by informal dialogue to listen to concerns and provide simple technical solutions.

During implementation, the principal monitored activities through classroom visits, checks of activity logs on school platforms, and periodic reports. Monitoring instruments included digital observation sheets through Google Forms and teachers' activity journals (KS.41). Evaluation meetings were held every two weeks during the intensive period, and the results were documented in the teacher performance report application and the supervision agenda book. The principal obstacle at this stage was limited teacher time due to administrative workload. The principal addressed this by integrating digital literacy into administrative tasks, for example through office automation, and by holding end-of-month reflection sessions to formulate longer-term solutions. These constraints slowed program progress but did not prevent the main objectives from being achieved.

These findings reflect the actuating function, which emphasizes leadership by example and the leader's ability to motivate others (Terry, 1977). The principal's modelling of technology use represents digital leadership (Muslim, 2021) and is consistent with Kasim and Surya (2025), who found that digital leadership, particularly its visionary and professional development dimensions, positively influences teachers' technology use. Peer coaching and individual dialogue also demonstrate attention to teachers' psychological needs. This is relevant to Berkovich and Hassan's (2022) finding that teachers' intrinsic motivation is an important pathway linking digital instructional leadership with student learning outcomes. Integrating the program into daily teaching also reduces the perception that digital literacy is an additional burden.

Tiered Supervision and the Improvement Cycle

Program supervision was conducted in tiers, beginning with the program coordinator and ending with final verification by the principal, through weekly monitoring and clinical supervision at least once each semester (KS.49). Program success was assessed using clear indicators:

> *"The indicators are an increase in the number of teachers certified in digital competence, active use of the LMS, and greater variation in digital instructional media in the classroom. The target is for at least 80% of teachers to be able to create instructional videos independently or pass the basic level of digital literacy." (KS.51)*

Supervision results were communicated to teachers through private, constructive face-to-face meetings and motivating written notes, allowing teachers to receive feedback without feeling embarrassed. Evaluation data were then used as the basis for advanced training or infrastructure improvements in the following academic year (KS.54).

This pattern is consistent with the controlling function, which involves monitoring, assessment, and corrective action to ensure that activities proceed according to plan (Asmadi et al., 2022). The use of supervision as an evaluation instrument reinforces the principal's role as supervisor and evaluator (Mubarika et al., 2023; Sari et al., 2021). The use of digital observation sheets and platform activity logs also shows that supervision itself has become technology-enabled. Using evaluation results as the basis for subsequent programs creates a continuous improvement cycle characteristic of school quality management (Kamaruddin et al., 2021). Private and constructive feedback further confirms that supervision is intended to develop teachers rather than to search for faults.

Table 2. Summary of Principal Management Strategies

Function	Main Strategy	Data Evidence
Planning	Data-driven needs identification (Education Report Card, PMM, questionnaire, observation); priority programs: AI and Canva workshops, PMM mentoring, digital Learning Community; short- and long-term horizons; asset and BOS mapping; joint anticipation of constraints with the school committee and supervisors	KS.01, KL.02, KS.06, KS.11
Organizing	Competence-based tasks through the Implementation Team decree; peer tutors and the Learning Community as coordination mechanisms; WhatsApp group, task application, weekly meetings; job descriptions and SOPs; IHT with external speakers	KS.17, KS.22
Implementation	Project-based program integrated into daily teaching; principal role modelling; praise, certificates, SKP points; peer coaching and individual dialogue; monitoring through supervision, platform logs, and digital observation	KS.34, KS.37, KS.41
Supervision	Tiered supervision; weekly monitoring and semester clinical supervision; indicators and target of ≥80% of teachers producing instructional videos; private feedback; evaluation results used as the basis for the next program	KS.49, KS.51, KS.54

Source: Analysis of research data, 2025

Supporting and Inhibiting Factors

The teacher digital literacy improvement program was supported by five main factors: teachers with strong technology skills who were willing to serve as peer tutors, a computer laboratory and Chromebooks, the Learning Community as a collaborative forum, BOS funding, and the principal's role modelling and commitment. Peer support was identified as a key strategy for anticipating constraints:

> *"Other parties who help anticipate digital literacy constraints are colleagues whose digital technology skills are stronger and can be utilized to support others." (KL.16)*

Inhibiting factors included a limited number of devices and unstable internet connectivity, uneven digital competence among teachers accompanied by resistance from some senior teachers, limited procurement and maintenance budgets, and administrative workload that made training schedules difficult to arrange.

> *"The constraints include the limited number of available devices, differences in educators' digital abilities, limited school budgets, and unstable internet network infrastructure." (KL.11)*

The principal responded to these constraints adaptively by maximizing the available devices, encouraging peer collaboration, preparing realistic budgets according to priorities, and arranging shared use of the internet network according to need (Table 3).

Table 3. Supporting Factors, Inhibiting Factors, and Principal Responses

Aspect	Supporting Factors	Inhibiting Factors	Response
Human resources	Technology-proficient teachers as peer tutors; principal commitment and role modelling	Uneven digital competence; resistance among senior teachers	Peer coaching, persuasive communication, individual dialogue
Facilities and network	Computer laboratory, Chromebooks, internet access	Limited devices; unstable connectivity	Optimization of available devices; alternating network use
Budget	BOS funds; opportunities for external cooperation	Limited procurement and maintenance budget	Phased procurement and priority-based budgeting
Organization and time	Learning Community as a collaborative forum	Administrative workload limits training time	Integration of digital literacy into administrative tasks; monthly reflection

Source: Analysis of research data, 2025

The findings regarding infrastructure constraints and teacher digital competence are consistent with Kasim and Surya (2025), who concluded that teacher digital competence and school technology infrastructure remain major barriers to technology integration. Resistance among senior teachers is a common feature of organizational change and requires a gradual approach. A distinctive feature at SMP Negeri 2 Samboja is the principal's use of peer collaboration as the primary response to almost every constraint: peer tutors reduce competence gaps, the Learning Community provides a coordination forum, and peer coaching reduces teachers' anxiety about technology. This pattern supports Rasdiana et al.'s (2024) argument that professional learning communities provide an important pathway linking digital leadership with improved teacher capability. The principal's commitment also plays an important role in improving educational quality more broadly (Susanti, 2023).

Teacher Digital Literacy Management Cycle

The synthesis of findings produced the teacher digital literacy management cycle presented in Image 1. The cycle positions the four management functions as a recurring sequence: data-driven planning, collaborative organizing, integrated and human-centered implementation, and tiered supervision whose results feed back into planning for the following year. The Learning Community, peer tutors, and principal role modelling occupy the center of the cycle as its core drivers, while supporting and inhibiting factors form the conditions that accelerate or slow the cycle.

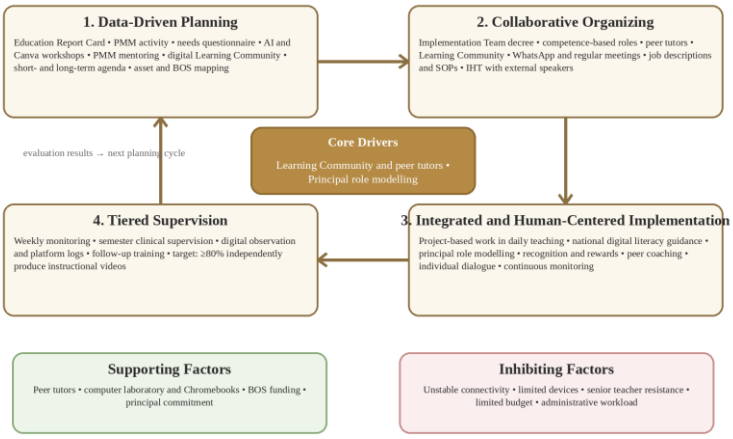

Image 1. Data-Driven and Peer-Collaborative Management Cycle for Teachers' Digital Literacy
Source: Synthesis of research findings, 2025

The practical implication is that principals in similarly constrained schools do not need to wait for complete infrastructure before initiating a program. They can begin with available needs data, empower teachers who are already proficient as internal drivers, integrate the program into teachers' routine work, and use evaluation as a basis for improvement. Nevertheless, program success remains dependent on policy and financial support from outside the school, particularly for devices and stable connectivity.

CONCLUSION

The principal's management strategy for improving teachers' digital literacy at SMP Negeri 2 Samboja was implemented through the four management functions in an integrated manner. Planning was systematic and participatory, based on needs data from the Education Report Card, PMM, questionnaires, and observation. Organizing relied on competence-based task allocation formalized through an Implementation Team decree, the empowerment of peer tutors and the Learning Community, and IHT as initial training. Implementation was integrated into daily teaching through principal role modelling, rewards, and peer coaching. Supervision was conducted in tiers using measurable indicators, constructive feedback, and evaluation results to improve subsequent programs. Peer tutors, ICT facilities, the Learning Community, BOS funding, and principal commitment served as supporting factors, while limited devices and connectivity, competence gaps and resistance among senior teachers, budget limitations, and administrative workload acted as constraints.

This study contributes a teacher digital literacy management cycle grounded in needs data and driven by peer collaboration. Principals are advised to strengthen the follow-up to supervision through continued mentoring and to give particular attention to reducing competence gaps among teachers. Education authorities should support the provision of devices, network stability, technology-based training, and integrated monitoring systems. The study is limited to one school and relies primarily on information from the principal and literacy coordinator. Future research should involve more schools and a broader range of informants, including classroom teachers, supervisors, and students, and should use quantitative or mixed-method approaches to measure the effects of improved teacher digital literacy on instructional quality and student learning outcomes.

REFERENCES

Asmadi, I., Romansyah, R., Farid, M., Ilyas, A., Habaib, M., Warta, W., . . . Sauri, S. (2022). Manajemen kepala sekolah guna meningkatkan mutu pendidikan (studi kasus SMAT Riyadlul Ulum, Pesantren Condong Tasikmalaya). JIIP: Jurnal Ilmiah Ilmu Pendidikan, 5(12), 5830–5836. https://doi.org/10.54371/jiip.v5i12.1270

Berkovich, I., & Hassan, T. (2022). Principals' digital instructional leadership during the pandemic: Impact on teachers' intrinsic motivation and students' learning. Educational Management Administration & Leadership, 52(4), 934–954. https://doi.org/10.1177/17411432221113411

Erwani, E., Witarsa, R., & Masrul, M. (2023). Penerapan program kepala sekolah terhadap kemampuan guru dalam menggunakan informasi teknologi dan literasi digital di sekolah dasar. Journal of Education Research, 4(3), 957–963. https://doi.org/10.37985/jer.v4i3.263

Gilster, P. (1997). Digital literacy. John Wiley & Sons.

Hermila, A., & Bau, R. (2023). E-learning sebagai komplemen dalam pembelajaran: Perwujudan akselerasi transformasi digital dalam pendidikan. Jurnal Studi Kebijakan Publik, 2(1), 69–79. https://doi.org/10.21787/jskp.2.2023.69-79

Kamaruddin, K., Yahya, M., Mulyadi, A., & Basso, S. (2021). Peran kepala sekolah dan tim penjamin mutu sekolah dalam menerapkan manajemen mutu di SDN 1 Lejang Kabupaten Pangkep. Guru Membangun, 40(2), 74. https://doi.org/10.26418/gm.v40i2.49199

Kasim, M., & Surya, P. (2025). Dampak kepemimpinan digital kepala sekolah terhadap integrasi teknologi guru di sekolah dasar. Jurnal Pendidikan dan Kebudayaan, 10(1), 1–18. https://doi.org/10.24832/jpnk.v10i1.5662

Khotimah, N., & Reza, M. (2022). Digital literacy to improve pedagogical and professional competence of early childhood teacher. Jurnal Inovasi dan Teknologi Pembelajaran, 9(2), 117. https://doi.org/10.17977/um031v9i22022p117

Lincoln, Y. S., & Guba, E. G. (1985). Naturalistic inquiry. SAGE Publications.

Margana, J. S., Hidayati, D., & Suyatno, S. (2024). Kepemimpinan kepala sekolah dan tantangan meningkatkan mutu sekolah di era digital. Jurnal Manajemen Pendidikan, 9(2), 253–261. https://doi.org/10.34125/jmp.v9i2.345

Mei, H., Supeningsih, S., Purba, A. Y., Sherly, S., & Herman, H. (2026). Strengthening Collaborative Leadership as a Strategy for Improving the Quality of Community-Based Elementary Schools. African Journal of Advanced Arts and Humanities, 4(3). Retrieved from https://journals.evonexpublishers.com/index.php/AJAAH/article/view/102

Miles, M. B., Huberman, A. M., & Saldaña, J. (2014). Qualitative data analysis: A methods sourcebook (3rd ed.). SAGE Publications.

Mubarika, F., Imani, H., Astrella, K., Febry, M., & Arianti, N. (2023). Implementasi supervisi pendidikan kepala sekolah sebagai wahana evaluasi kinerja tenaga pendidik dan kependidikan. Proceedings Series of Educational Studies. https://doi.org/10.17977/um083.7868

Muslim, M. (2021). Visi kepemimpinan digital kepala sekolah dasar di era teknologi digital. Elementeris: Jurnal Ilmiah Pendidikan Dasar Islam, 3(1), 1. https://doi.org/10.33474/elementeris.v3i1.8796

Ng, W. (2012). Can we teach digital natives digital literacy? Computers & Education, 59(3), 1065–1078. https://doi.org/10.1016/j.compedu.2012.04.016

Ningsih, I., Widodo, A., & Asrin, A. (2021). Urgensi kompetensi literasi digital dalam pembelajaran pada masa pandemi Covid-19. Jurnal Inovasi Teknologi Pendidikan, 8(2). https://doi.org/10.21831/jitp.v8i1.35912

Nugraha, D. (2023). Manajemen pendidikan. JPI, 1(01), 36–39. https://doi.org/10.63018/jpi.v1i01.10

Panjaitan, M. R., Silalahi, M., Sidabutar, W. G., Adilan, H. A., Sinurat, R., Sitorus, J. T. J., Purba, R., Rumbiak, Y., Nainggolan, G., Soraya, N., and Pandia, M. M. (2026) Strategi kepemimpinan visioner: Menjawab tantangan abad ke-21. Padang: Penerbit Get Press Indonesia. ISBN: 978-634-255-309-1

Rasdiana, R., Nurhadi, T., Akbar B., M. I., Salim, F. A., Novitasari, A. T., Cholidah, R. N., Susanto, K., Ma'rifatin, S., Rawe, N. S. H. A., Paranoan, C. A. C., Sartika, R. P., Kadju, M. D. P., & Habibah, L. B. (2024). The effect of digital leadership in nurturing teachers' innovation skills for sustainable technology integration mediated by professional learning communities. Journal of Infrastructure, Policy and Development, 8(10), Article 8480. https://doi.org/10.24294/jipd.v8i10.8480

Ratnaningsih, N., Patmawati, H., Sukirwan, S., Nugraha, D., Suhaya, S., Nurfadillah, Z., . . . Maheltra, A. (2025). Penguatan literasi digital bagi guru-guru di lingkungan pesantren Kabupaten Tasikmalaya melalui pelatihan

dan pendampingan penggunaan learning management system (LMS). Jurnal Pengabdian pada Masyarakat, 10(2), 490–499. https://doi.org/10.30653/jppm.v10i2.1287

Rokhim, D., Rahayu, B., Alfiah, L., Peni, R., Wahyudi, B., Wahyudi, A., . . . Widarti, H. (2021). Analisis kesiapan peserta didik dan guru pada asesmen nasional (asesmen kompetensi minimum, survey karakter, dan survey lingkungan belajar). JAMP: Jurnal Administrasi dan Manajemen Pendidikan, 4(1), 61. https://doi.org/10.17977/um027v4i12021p61

Saragih, N., Effendi, Sherly, Silalahi, M., Siregar, L., & Herman. (2024). The Influence of Self-Efficacy and School Culture on the Job Satisfaction of RK Bintang Timur Private Elementary School Teachers. Bulletin of Science Education, 4(3), 29–38. https://doi.org/10.51278/bse.v4i3.1462

Sari, E., Sihaloho, R., Sutomo, S., & Arum, W. (2021). Meningkatkan komitmen guru melalui optimalisasi kepemimpinan kepala sekolah. Jurnal Jendela Pendidikan, 1(04), 250–264. https://doi.org/10.57008/jjp.v1i04.32

Sinaga, M., Sherly, S., & Herman, H. (2024). Pengaruh Gaya Kepemimpinan Altruistik dan Supervisi Kelas untuk Meningkatkan Kepuasan Kerja Guru di SD Wilayah Siantar Naungan YPK ST. Yoseph Pematangsiantar. Bulletin of Community Engagement, 4(2), 1–7. https://doi.org/10.51278/bce.v4i2.1089

Sinaga, M., Efendi, E., Sherly, S., Siregar, L., Butarbutar, M., and Herman, H. (2024). The Effect of Altruistic Leadership on Competencies with Self Efficacy as Intervening Variables for the Principal by YPK St. Yoseph Medan in Pematangsiantar. Sarcouncil Journal of Education and Sociology, 3(10), 1-9. https://doi.org/10.5281/zenodo.13899767

Sinurat, R., Herman, H., Panjaitan, M. B., Batubara, J., Sherly, S., Silalahi, M., & Simatupang, S. (2026). Sosialisasi Kepemimpinan Visioner dalam Meningkatkan Kualitas Pelayanan Publik di SMA Plus Efarina. Pengabdian Masyarakat Sumber Daya Unggul, 4(2), 34–42. Retrieved from https://publikasi.abidan.org/index.php/pmsdu/article/view/2021

Susandi, A., Amelia, D., Huda, M., MZ, A., & Khasanah, L. (2025). Relevansi kurikulum merdeka berbasis literasi digital menuju generasi Indonesia Emas 2045. Journal of Nusantara Education, 4(2), 109–119. https://doi.org/10.57176/jn.v4i2.148

Susanti, S. (2023). Manajemen peran kepala sekolah dalam meningkatkan mutu pendidikan. Jurnal Impresi Indonesia, 2(6), 574–581. https://doi.org/10.58344/jii.v2i6.2916

Terry, G. R. (1977). Principles of management (7th ed.). Richard D. Irwin.

Utari, A., Roza, Y., & Maimunah, M. (2023). Pemahaman guru matematika terhadap asesmen nasional pada kurikulum merdeka belajar. JIPM (Jurnal Ilmiah Pendidikan Matematika), 11(2), 433. https://doi.org/10.25273/jipm.v11i2.12876

Wakila, Y. (2021). Konsep dan fungsi manajemen pendidikan. Jurnal Ilmiah Social Teknik, 3(1), 49–62. https://doi.org/10.46799/jequi.v3i1.33

Wati, D., Wahyuni, N., Fatayan, A., & Bachrudin, A. (2022). Analisis kepemimpinan kepala sekolah di sekolah dasar. Jurnal Basicedu, 6(5), 7970–7977. https://doi.org/10.31004/basicedu.v6i5.3684

Wiguna, K. (2023). Analisis kompetensi literasi digital pada guru sekolah menengah atas. Jurnal Riset Manajemen Komunikasi, 3(1), 21–32. https://doi.org/10.29313/jrmk.v3i1.2316

Yin, R. K. (2018). Case study research and applications: Design and methods (6th ed.). SAGE Publications.

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