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Integration of Technology and Good Governance in Educational Management: Towards a Smart School Ecosystem

Dadang Rahman Munandar

Universitas Singaperbangsa Karawang; dadang.rahman@fkip.unsika.ac.id

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ABSTRACT

This study aims to analyze the integration of technology and governance in education management as a strategic step toward establishing a smart school ecosystem. The development of information technology demands that educational institutions adapt by implementing digital systems integrated with the principles of transparent, accountable, and participatory governance. Using a descriptive qualitative approach, this research explores in depth the implementation of technology and governance practices in schools, as well as how the two support each other in creating sustainable educational transformation. Data were collected through interviews, observations, and documentation at smart elementary schools in the city of Bandung that have adopted digital management and learning systems. The findings reveal that the implementation of Information and Communication Technology (ICT) in education management has brought significant changes in efficiency, transparency, and accessibility in education. Through online learning systems, assessment software, and programs such as SaKOJA in Bandung, ICT enhances learning quality and broadens access, including for students with physical limitations. The integration of ICT in educational governance enables more structured administrative management, strengthens collaboration among stakeholders, and supports more flexible and responsive learning. With strong, technology-based governance, education can become more inclusive, efficient, and adaptive to changing times, creating smart schools that equip students with relevant skills for the future

Corresponding Author:
Siti Maspupah
Program Studi Pendidikan Masyarakat Universitas Pendidikan Indonesia; iie.sitimaspupah@upi.edu

1. INTRODUCTION

With the rapid advancement of Information and Communication Technology (ICT), the world of education is undergoing profound transformation in various aspects, particularly in how learning is managed and implemented. The integration of technology into education management is no longer merely an alternative but a pressing necessity to address the challenges of the times (Maritsa et al., 2021).

Technology enables the automation of administrative processes, streamlining of student data management, and increased efficiency in information distribution among educational stakeholders. The use of digital-based management systems, such as Learning Management Systems (LMS), School Information Systems (SIS), and online collaborative platforms, has become essential tools in building governance that is effective and adaptive to change (Hermawansyah, 2021).

Furthermore, technology plays a key role in expanding access to education and enhancing inclusivity for students from diverse backgrounds. With the advent of online and hybrid learning models, students can now learn anytime and anywhere, unhindered by the limitations of physical classrooms (Agustian & Salsabila, 2021). This presents opportunities for schools to reach remote areas and communities that have traditionally faced limited access to education. On the other hand, technological integration must also be accompanied by governance that is responsive, visionary, and collaborative to ensure that digital transformation in education proceeds optimally and sustainably (Husaini, 2017).

School governance in the digital era must be capable of accommodating change through more open, transparent, and data-driven approaches. Effective governance involves not only administrative aspects but also strategic planning, participatory decision-making, and accountable oversight of all educational processes (Kusnandi, 2019). Technology enables school principals and management teams to access real-time data, conduct evidence-based evaluations, and design more targeted educational interventions. Moreover, good governance in the digital age must also consider the digital literacy of all stakeholders—teachers, students, and parents—so that technology becomes not just a support tool, but an integral part of the school's work and learning culture (Destari, 2023).

The need for transformation toward a smart school ecosystem emerges as a response to the complexity of educational challenges in the digital era. Schools can no longer merely serve as places for knowledge transfer; they must evolve into adaptive, collaborative learning environments focused on developing 21st-century competencies (Purfitasari et al., 2019). A smart school ecosystem is characterized by the integration of technology in all aspects of management and learning processes, data-driven decision-making, and active involvement from all parties—including teachers, students, parents, and the wider community. Smart schools do not solely rely on technological tools but build systems capable of responding quickly to change, facilitating innovation, and fostering a culture of lifelong learning (Sijabat et al., 2021).

This transformation also requires a shift in mindset and educational leadership practices. School principals and stakeholders must possess a long-term vision for utilizing technology to enhance education quality, while also creating a safe, inclusive learning environment that supports the growth of every individual (Siti Harlina, 2019). Within a smart school ecosystem, collaboration among schools, governments, and the private sector is also essential to support the availability of digital infrastructure, human resource training, and the development of technology-based curricula. By building such an ecosystem, schools become not only effective learning spaces but also centers for innovation and social transformation in their communities (Hizbullah & Haidir, 2021).

Previous studies have examined the implementation of technology in education. Lestari (2018) emphasized the importance of digital literacy in shaping 21st-century learning, while Usman (2014) highlighted that technology must be accompanied by school management reform and policy changes to have a significant impact on education quality. In terms of governance, Good Governance in education provides the foundation for transparency, accountability, participation, and effectiveness in school management. Research by Putra & Roni (2021) demonstrated that leadership and data-driven policies play crucial roles in the sustainable implementation of educational technology. The emergence of the smart school ecosystem demands synergy between educational policies, school management information systems (SMIS), digital infrastructure, and human resource training.

However, research gaps remain, particularly in how the integration of technology systems and governance can be carried out harmoniously and sustainably, especially in the context of secondary schools in developing countries like Indonesia. There is still a lack of studies exploring how school management can transform through digital systems that support real-time decision-making, data-based

evaluation systems, and the involvement of the entire educational ecosystem (teachers, students, parents, and government). Therefore, this study aims to enrich the literature by offering a holistic approach to the integration of technology and governance in creating a smart school ecosystem, and by analyzing implementation models that can be replicated in various educational contexts across Indonesia.

2. METHODS

This research employs a descriptive qualitative approach aimed at gaining an in-depth understanding of how the integration of technology and governance is implemented in educational management toward the development of a smart school ecosystem. This approach was chosen because it allows for a holistic description of phenomena in a natural context and enables the researcher to explore the perspectives, experiences, and practices of educational stakeholders directly. Data collection techniques include in-depth interviews with school principals, teachers, and educational staff; observation of technology-based managerial activities; and documentation of school policies and information systems used (Sugiyono, 2016). The research was conducted in several smart schools located in the city of Bandung. Data analysis was carried out using the techniques of data reduction, data presentation, and gradual conclusion drawing. The validity of the data was ensured through source and technique triangulation, by comparing the results of interviews, observations, and related documents. Through this method, the research aims to provide a comprehensive picture of the practices of integrating technology and governance in creating an effective, inclusive, and sustainable smart school ecosystem.

3. FINDINGS AND DISCUSSION

Implementation of Information and Communication Technology in Educational Management

The implementation of Information and Communication Technology (ICT) in educational management has become a key strategy in addressing the challenges of globalization and digitalization in the education sector. The use of ICT allows for more efficient, transparent, and measurable management of educational administration. ICT in educational management can be applied in various forms, such as online learning, information systems, and communication platforms (Burhan et al., 2023).

Online learning is one form of ICT implementation in education that enables the teaching and learning process to occur without the constraints of time and space. Through online learning platforms such as Learning Management Systems (LMS), e-learning, Google Classroom, and Moodle, teachers can deliver structured material in the form of modules, videos, interactive quizzes, and discussion forums (Arthana et al., 2018). This provides flexibility for students to access learning at their own pace and according to their needs, while also making it easier for teachers to monitor and evaluate student progress digitally.

Online learning also expands access to education, especially for students who face difficulties attending physical classes. Learning materials can be accessed anytime and anywhere, making education more inclusive (Darma, 2024). Although there are still challenges such as limited infrastructure, uneven internet connectivity, and varying levels of digital literacy among teachers and students, various efforts have been made to overcome these obstacles. Governments and schools have begun collaborating to provide teacher training, facilitate access to technological devices, and develop sustainable learning systems.

The use of multimedia in presentations—such as animated videos, infographics, and audio learning—further enhances the effectiveness of online learning. Visual and audio media help explain complex concepts in ways that are easier for students to understand while maintaining their focus and interest in learning. Multimedia-based presentations also promote deeper multisensory learning, where students not only read text but also see and hear the material directly (Zein, 2024). By integrating online

learning platforms, educational applications, and multimedia, education becomes more inclusive, adaptive, and relevant to the needs of today's digital generation.

Furthermore, the application of information systems in educational management has become a strategic step to improve efficiency and transparency within schools. School administrative information systems allow for more structured and centralized management of student, teacher, staff, financial, and academic data (Supianto et al., 2019). With such systems, administrative activities that were previously done manually can now be automated, reducing the workload of administrative staff and minimizing data entry errors. In addition, data access becomes faster and more accurate, supporting decision-making based on real data.

These information systems also play an important role in school financial management—from recording income and expenses, reporting School Operational Assistance (BOS) funds, to budget transparency that can be monitored by stakeholders. On the academic side, teachers can manage grades, attendance, and student progress within the same platform, creating more integrated communication among school departments. Parents can also be involved through online access to their children's academic information, enhancing transparency and strengthening the partnership between school and family.

One increasingly popular implementation of information systems is web-based student admissions. This system simplifies the new student registration process online, from filling out forms and uploading documents to the announcement of selection results. Prospective students and parents no longer need to visit the school in person, making the process more efficient and practical. For schools, this system facilitates the management of applicant data, selection scheduling, and administrative documentation in a more organized manner. Besides creating a more transparent and accountable process, using such systems also reflects the school's readiness to transition toward a modern digital education ecosystem.

Lastly, the use of assessment software in the education system is a form of technology integration that greatly assists teachers in managing and analyzing student learning outcomes more efficiently and objectively. This software enables teachers to create various types of assessments such as quizzes, multiple-choice tests, short answer questions, and essays, which students can access online. The results are directly recorded in the system, making automatic grading easier and reducing potential errors in score processing. This certainly accelerates the evaluation process and allows teachers to provide constructive feedback to students promptly.

In addition to efficiency, assessment software also supports accuracy in measuring student learning achievements. Some software comes equipped with basic statistical analysis features that show grade distribution, question difficulty levels, and class average achievements. This information is very useful for teachers to evaluate the effectiveness of their teaching methods and adjust their future learning strategies. Assessments are no longer just about giving grades, but also serve as a comprehensive tool for mapping students' abilities in various aspects.

From the observations and interviews conducted by the researcher with school principals and teachers at several schools that have adopted the smart school concept, it was found that the city of Bandung demonstrates a strong commitment to the development of ICT in the education sector. One tangible form of this commitment is the launch of the SaKOJA (Sakola Juara) program, a digital innovation designed to improve the quality of learning in schools. SaKOJA not only serves as a platform for online teaching materials and learning assessments but is also integrated with the eKTSP (Electronic School-Based Curriculum), which facilitates the digital and structured development and management of curricula.

The presence of SaKOJA creates strong continuity between local government policies and daily school management practices. This program facilitates direct communication between the Bandung City Education Office and educational institutions, ensuring that each policy, curriculum, and learning innovation can be implemented uniformly and efficiently. With this system, schools are not only becoming more adaptive to technological advancements but also have clear guidelines and support in

managing the teaching and learning process. This initiative reflects a concrete step toward sustainable digital transformation in education and serves as a vital foundation in realizing a smart school ecosystem in Indonesia.

Governance Practices in Supporting Smart Schools

The management of educational flow plays a crucial role in strengthening Indonesia's position as a country capable of competing in a dynamic global economy. Education that is managed effectively and adaptively becomes the key to equipping citizens with relevant skills, eradicating poverty, and encouraging innovation. Unfortunately, the current education system still faces major challenges, particularly in learning approaches that fail to spark students' enthusiasm and creativity. Many learning processes still emphasize rote memorization, without giving students room to truly understand and apply the material they learn. As a result, graduates tend to have strong theoretical knowledge but lack practical skills and the critical thinking required in the real world.

In this context, educational governance plays a strategic role as a framework to ensure that all educational elements—human resources, infrastructure, and curriculum policies—operate in harmony toward set goals (Sumual et al., 2024). Learning governance is not merely about managing administration, but also involves planning lessons appropriately, organizing the sequence of materials, and utilizing resources such as syllabi, modules, and other teaching tools. The goal is to create a learning environment that is responsive to the needs of students according to their educational level. With strong governance, teachers can better understand students' characteristics and needs, allowing them to design instructional strategies that promote higher-order thinking skills and real-world application-based learning (Rostiawati, 2020).

Effective school governance can support smart schools by applying several key principles, including:

Transparency and Accountability

This principle emphasizes the importance of managing resources—financial, human, and material—in an open and accountable manner. It includes clear financial reporting, documented decision-making processes, and monitoring systems that allow all parties to understand how policies are being implemented. With transparency, trust among stakeholders increases and the potential for abuse of power can be minimized.

Collaboration

The use of information technology is an important tool to encourage collaboration within the school environment. Digital systems enable rapid and effective exchange of information and ideas among teachers, students, school staff, and parents. Such collaboration not only accelerates decision-making processes but also enriches perspectives in solving problems and designing innovative learning strategies.

Active Participation

Effective school governance requires the active involvement of all stakeholders, such as teachers, students, parents, and administrative staff. This involvement can take the form of communication forums, school deliberations, or participatory digital platforms that allow feedback and suggestions to be submitted directly. By involving many parties, school policies become more inclusive and reflective of the actual needs of the educational community.

Professional Development for Teachers

Teacher competence is one of the main pillars of educational success. Therefore, professional development through training, workshops, and continuous coaching is a crucial part of school governance. By strengthening teachers' capacity to face 21st-century challenges, schools can enhance the quality of teaching and deliver learning that is relevant to current developments.

Evaluation and Monitoring

Periodic evaluations and monitoring allow schools to assess the effectiveness of the programs and activities being carried out. With accurate evaluation data, schools can make evidence-based decisions, adjust strategies, and improve aspects of the education system that are not yet optimal.

Development of the Learning Environment

An inclusive learning environment that supports individual growth is part of ideal governance. Schools need to create a safe, friendly, and conducive atmosphere for all students regardless of social, cultural, or ability backgrounds. This approach strengthens the sense of belonging to the school and increases student motivation to learn.

Fair and Motivating Policies

Fairness is the foundation of school policy-making. Fair policies ensure that all school members receive equal treatment and have access to learning and personal development opportunities. Moreover, motivating policies—such as rewarding achievements and supporting students facing difficulties—create a positive school culture and foster a strong learning spirit.

Effective school governance plays an important role in realizing smart schools by first establishing a clear vision, mission, and goals. This clarity of direction becomes the main foundation in designing educational development strategies, including systematically integrating technology. A school with a clear direction will more easily align its steps with the times and instill an innovative culture among all its members—teachers, students, and educational staff.

In addition, it is important for schools to develop a strong governance system. This includes a transparent organizational structure, inclusive decision-making processes, and policies that support the achievement of school goals. Strong governance can coordinate resources efficiently and ensure consistency in program implementation. In the context of smart schools, strengthening data-driven management and results-based evaluation is essential to ensure that innovation is not sporadic, but well-directed and impactful.

One of the key characteristics of a smart school is the ability to use technology wisely—not only adopting ICT tools but also strategically integrating them into all aspects of management and learning (Omidinia et al., 2013). Technology should serve to enhance efficiency, broaden access to information, and facilitate more personalized and flexible learning. Smart schools are capable of using digital tools to improve administrative services, evaluation processes, and both internal and external communication.

In this digital era, social media and other ICT tools have become powerful means to reach school communities widely and quickly. Social media can be used to share academic information, build constructive interaction between students and teachers, and enhance the school's image in the public eye. This use of technology must be accompanied by strong digital literacy to ensure effective use and prevent gaps or misuse (Ibrahim et al., 2013).

Finally, to ensure the sustainability of the transformation toward smart schools, schools must foster trust and collegiality—among teachers, students, parents, and education policymakers. Working relationships built on mutual trust create a collaborative climate that supports collective decision-making and program implementation. Building meaningful relationships with all stakeholders is also key to ensuring that digital transformation is not merely a technology project, but part of a broader cultural shift toward a more humanistic, adaptive, and sustainable education system.

Integration of Technology with Governance in Educational Management Towards a Smart School Ecosystems

The integration of technology with governance in educational management opens up significant opportunities to revolutionize the education system holistically. Through the utilization of information and communication technology, school administrative processes can be conducted more efficiently and accurately, enabling centralized and easily accessible management of student, teacher, financial, and academic data. Moreover, technology enhances the quality of learning through online platforms, digital-based evaluations, and more open communication between schools, students, and

parents. Educational accessibility is also increasingly equitable, as technology reaches various segments of society regardless of geographic boundaries.

A smart school ecosystem is an integrated educational system that optimally utilizes digital technology to improve learning quality, school management efficiency, and strengthen collaboration among stakeholders. In this ecosystem, technology is not merely a supporting tool but an essential part of all educational processes—from learning planning, implementation, and evaluation to school administrative management (Benoliel & Schechter, 2023). Smart schools also promote inclusive, adaptive, and data-driven learning environments where teachers, students, parents, and school management can interact actively and productively. This approach enables schools to create learning experiences that are more relevant, responsive to students' needs, and aligned with the developments of the times.

The main component of a smart school ecosystem is the integration of digital technology into all aspects of learning and school management. This includes the use of digital platforms for content delivery, learning support applications, software-based evaluation systems, and school information systems that facilitate the management of student, teacher, and academic data (Zhou, 2022). With digital technology, the teaching and learning process becomes more flexible, interactive, and personalized, allowing students to learn at their own pace and learning style. Additionally, teachers can monitor student progress in real-time and adjust their teaching strategies more effectively.

Beyond technology, collaboration among stakeholders is also a crucial component of a smart school ecosystem. This collaboration involves teachers, students, parents, and school leaders in an open and participatory educational process. Through digital-based communication, such as online discussion groups, information portals, and school communication apps, all parties can share information, provide feedback, and work together to create a conducive learning environment (Nasir et al., 2023). Effective collaboration supports transparency, accelerates decision-making, and fosters a strong sense of ownership in the educational process. Thus, the smart school ecosystem is supported not only by technology but also by synergistic and productive social relationships (Dacholfany, 2024).

The integration of technology and governance in a smart school ecosystem is reflected in how all aspects of management and learning are unified within a digital-based system. Technology is utilized to manage school administration, such as student, teacher, financial, and academic data, efficiently through an education management information system. With this system, decision-making can be executed faster, more accurately, and transparently, as all information is accessible in real time by authorized parties. Moreover, the learning process is enhanced through digital platforms that enable teachers to design materials, deliver lessons, and conduct evaluations online and interactively.

Based on specific observations and interviews with informants at smart elementary schools in Bandung City, the integration of technology and governance in educational management is implemented through the following strategies:

1. School Management Information System (SMIS)

Integrating all school data—such as student, teacher, financial, curriculum, and administrative data—into a single digital system is a strategic step in creating efficient and responsive educational management. This centralized platform allows easy and real-time recording, tracking, and reporting. Stakeholders including principals, teachers, administrative staff, and parents can access relevant data quickly and accurately. This enhances transparency and accountability in school management while accelerating data-driven decision-making. The integrated system also minimizes data redundancy, input errors, and information delays, supporting professional and adaptive governance aligned with modern developments.

2. Digital-Based Learning Planning and Evaluation

Using digital platforms for the preparation, storage, and monitoring of lesson plans, syllabi, and learning implementation plans (RPP) represents concrete integration of technology in modern and efficient curriculum management. With technology support, teachers can systematically create instructional tools, store them in the cloud, and share them easily with relevant parties such as school

principals and supervisors. Continuous monitoring ensures that each learning stage aligns with educational goals. Transparency is improved since learning documents are accessible anytime, maintaining teacher accountability in planning and delivering lessons. It also fosters teacher collaboration in developing relevant, student-centered teaching materials.

3. Online Administrative Services

Implementing web-based systems for new student registration, certificate issuance, attendance, and correspondence demonstrates significant digital transformation in school administrative governance. These processes, previously time-consuming and paper-based, are now conducted efficiently, quickly, and transparently. Prospective students and parents can register online without visiting the school, while certificates and other documents are processed through provided platforms. Student attendance is automatically recorded via digital apps linked to the school database, easing supervision and reporting. Electronic correspondence also streamlines communication and reduces paper dependency. These innovations enhance efficiency and strengthen accountability and public service in the education ecosystem.

4. Use of Learning Management System (LMS)

Utilizing digital platforms in teaching and learning offers convenience and structure for delivering materials, assignments, discussions, and assessments. Teachers can upload content in various formats—text, audio, video, or presentations—accessible to students anytime. Assignments are submitted through the same platform, with everything neatly documented for easier assessment. Discussions among teachers and students or peers are facilitated through integrated forums or chat rooms, promoting active interaction even in remote learning contexts. Exams can be conducted online with features like timed sessions, randomized questions, and automatic grading, making evaluations faster and more accurate. This approach increases learning efficiency and adaptability.

5. Digital Communication and Collaboration

Social media, instant messaging apps, and school communication platforms play a vital role in building strong, dynamic relationships between students, teachers, parents, and the school. These tools enable real-time communication so academic updates, announcements, and student progress can be shared quickly and directly. Teachers and parents can discuss student development, resolve issues collaboratively, and provide timely support. Students also feel more connected to the school community through continuous interaction. Integrating digital communication ensures active, transparent, and participatory engagement among all stakeholders, ultimately fostering an inclusive and responsive learning environment.

6. Data-Based Monitoring and Reporting

Dashboards or analytic systems in education management allow structured, data-driven monitoring of student academic progress, attendance, and teaching effectiveness. These dashboards present real-time information in an easy-to-understand interface, aiding teachers, principals, and parents in tracking student development. For instance, teachers can access test scores, assignments, and project data to identify areas needing attention. Attendance is automatically recorded, enabling easier discipline monitoring and decision-making for interventions. Analytics from this data also facilitate evaluation of teaching methods, enabling strategy adjustments to enhance student outcomes. This system streamlines learning management, offers deep insights, and drives continuous educational improvement.

7. Data-Driven Decision Making

Leveraging digital data to support school policies, planning, and program development is essential for creating an efficient and evidence-based education system. Data from exams, attendance, and feedback from students and parents can be analyzed to gain insights into school needs and challenges. School management can use this analysis to develop targeted policies, optimize resource allocation, and plan relevant programs for students. For example, if data reveals student difficulties in a particular subject, the school can initiate remedial programs or teacher training. This ensures that every decision is well-informed and aligned with actual conditions in the school environment.

4. CONCLUSION

The implementation of Information and Communication Technology (ICT) in education management has brought about significant transformations in the efficiency, transparency, and accessibility of education, especially through online learning, information systems, and assessment software. ICT enables more structured administrative management, simplifies the evaluation process, and expands access to education, including for students with physical disabilities. Innovations such as the SaKOJA program in Bandung City demonstrate a strong commitment to integrating technology into education, creating a more adaptive, structured, and sustainable system. The use of ICT not only improves the quality of learning, but also facilitates a closer relationship between government policies and practices in the field, forming a smart school ecosystem that supports the advancement of education in Indonesia. Effective education governance plays a key role in supporting the creation of smart schools that can produce students who are not only academically superior, but also have the practical skills and critical thinking skills needed in the real world. By systematically integrating technology into all aspects of management and learning, and applying the principles of transparency, collaboration, active participation, teacher professional development, and evidence-based evaluation, schools can create a responsive, inclusive, and innovative environment. Strong and collaborative governance will ensure the achievement of sustainable education goals, increase efficiency, and expand equitable access to education, while strengthening relationships between stakeholders for a more adaptive and humanistic transformation of education culture. The integration of technology with governance in education management creates a smart school ecosystem that improves administrative efficiency, learning quality, and collaboration between stakeholders. The use of school management information systems, digital learning platforms, and technology-based communication enables efficient, transparent, and evidence-based data management. In addition, the learning process becomes more flexible, interactive, and responsive to student needs, while data-based decision making supports more targeted planning. With technology, education governance can adapt to changing times, create an inclusive and relevant learning environment, and prepare schools to face future challenges.

REFERENCES

Agustian, N., & Salsabila, U. H. (2021). Peran teknologi pendidikan dalam pembelajaran. *Islamika*, *3*(1), 123-133.

Arthana, I. K. R., Dantes, G. R., & Dantes, N. (2018). Optimalisasi pemanfaatan teknologi informasi dan komunikasi (tik) dalam bidang pendidikan melalui penerapan smart school. *Widya Laksana*, *7*(1), 81-91.

Benoliel, P., & Schechter, C. (2023). Smart collaborative ecosystem: leading complex school systems. *Journal of Educational Administration*, *61*(3), 239-255.

Burhan, B., Nurwidyayanti, N., Irwandi, A., Shaleh, N. F., Pabulo, K., & Rahmadhanningsih, S. (2023). Analisis penerapan manajemen sekolah berbasis teknologi informasi dan komunikasi. *Jurnal Ilmiah Ecosystem*, *23*(2), 450-464.

Dacholfany, M. I. (2024). Peningkatan kualitas manajemen pendidikan di sekolah dasar melalui pelatihan dan bimbingan. *Community Development Journal: Jurnal Pengabdian Masyarakat*, *5*(1), 5-13.

Darma, R. (2024). Efektivitas Manajemen Publik Dalam Mengatasi Kesenjangan Pendidikan Di Indonesia. *Jurnal Review Pendidikan Dan Pengajaran (Jrpp)*, *7*(4), 15429-15436.

Destari, D. (2023). Pendidikan Global di Era Digital: Transformasi dalam Skala Internasional. *Jurnal Pendidikan West Science*, *1*(08), 538-553.

Hermawansyah, H. (2021). Manajemen lembaga pendidikan sekolah berbasis digitalisasi di era COVID-19. *Fitrah: Jurnal Studi Pendidikan*, *12*(1), 27-46.

Hizbullah, M., & Haidir, H. (2021, June). Peran Sekolah Dalam Pembentukan Akhlak Siswa Di Smp Cerdas Murni Tembung. In *Prosiding Seminar Nasional Hasil Penelitian* (Vol. 4, No. 1, pp. 213-220).

Husaini, M. (2017). Pemanfaatan teknologi informasi dalam bidang pendidikan (e-education). *MIKROTIK: Jurnal Manajemen Informatika*, *2*(1).

Ibrahim, M. S., Razak, A. Z. A., & Kenayathulla, H. B. (2013). Smart principals and smart schools. *Procedia-social and behavioral sciences*, *103*, 826-836.

Kusnandi, K. (2019). Mengartikulasikan perencanaan pendidikan di era digital. *Jurnal Wahana Pendidikan*, *6*(1), 1-14.

Lestari, S. (2018). Peran teknologi dalam pendidikan di era globalisasi. *EDURELIGIA: Jurnal Pendidikan Agama Islam*, *2*(2), 94-100.

Maritsa, A., Salsabila, U. H., Wafiq, M., Anindya, P. R., & Ma'shum, M. A. (2021). Pengaruh teknologi dalam dunia pendidikan. *Al-Mutharahah: Jurnal Penelitian Dan Kajian Sosial Keagamaan*, *18*(2), 91-100.

Nasir, M., Mahmudinata, A. A., Ulya, M., & Firdaus, F. A. (2023). Strategi pemberdayaan sekolah sebagai upaya peningkatan manajemen pendidikan. *Journal of International Multidisciplinary Research*, *1*(2).

Omidinia, S., Masrom, M., & Selamat, H. (2013, July). An examination of the concept of smart school: An innovation to address sustainability. In *2nd International Conference on Advances in Computer Science and Engineering (CSE 2013)* (pp. 328-331). Atlantis Press.

Purfitasari, S., Masrukhi, M., Prihatin, T., & Mulyono, S. E. (2019). Digital Pedagogy sebagai Pendekatan Pembelajaran di Era Industri 4.0. In *Prosiding Seminar Nasional Pascasarjana* (Vol. 2, No. 1, pp. 806-811).

Putra, A. I. P., & Roni, M. (2021). Good Governance Dalam Lingkungan Pendidikan Tinggi (Good University Governance). *Al-Idarah: Jurnal Kependidikan Islam*, *11*(2), 226-236.

Rostiawati, E. (2020). Efektifitas Manajemen Kepemimpinan Dalam Menciptkan Good Governance. *Al-Tanzim: Jurnal Manajemen Pendidikan Islam*, *4*(1), 59-69.

Sijabat, K., Putera, R. E., & Rahayu, W. K. (2021). Kapabilitas Pemerintah Kota Padang Dalam Mitigasi Bencana Melalui Sekolah Cerdas Bencana. *Jurnal Administrasi Publik dan Pembangunan*, *2*(2), 130-139.

Siti Harlina, U. (2019). PPM Sekolah Cerdas Berbasis Teknologi Di Sd Islam Terpadu Wahdah Islamiyah 01 Makassar. *SINDIMAS*, *1*(1), 242-245.

Sugiyono, S. (2016). Metode penelitian kuantitatif, kualitatif, R&D. *Bandung: Alfabeta*, *1*(11).

Sumual, S. D., Rambitani, B. F., Sadsuitubun, M., Wakur, N., & Sumual, S. Y. (2024). Meninjau strategi kepengawasan dalam meningkatkan akuntabilitas dan transparansi tata kelola pendidikan. *Didaktik: Jurnal Ilmiah PGSD STKIP Subang*, *10*(2), 1092-1112.

Supianto, S., Atikah, A., & Marti'ah, S. (2019). Perancangan Sistem Informasi Administrasi Sekolah pada SMK Kesuma Bangsa 1 Depok. *Systematics*, *1*(2), 99-109.

Usman, A. S. (2014). Meningkatan Mutu Pendidikan Melalui Penerapan Manajemen Berbasis Sekolah. *Jurnal Ilmiah Didaktika: Media Ilmiah Pendidikan dan Pengajaran*, *15*(1), 13-31.

Zein, M. (2024). Transformasi Pendidikan Islam Di Era Digital, Tantangan Dan Solusi Dalam Meningkatkan Kualitas Pembelajaran. *JIPDAS (Jurnal Ilmiah Pendidikan Dasar)*, *2*(3), 146-156.

Zhou, B. (2022). Building a smart education ecosystem from a metaverse perspective. *Mobile Information Systems*, *2022*(1), 1938329.