

Research/Review

The Role of Principal Leadership Style in Enhancing 21st-Century Teaching Skills: Evidence from Indonesian Primary Schools

Wawan Kurniawan^{1*}, Syarifuddin², Muh. Fahreza W³¹ Universitas Patompo, Indonesia; e-mail : shifankurniawan@gmail.com² Universitas Patompo Indonesia; e-mail : syarif35mks@gmail.com³ Universitas Patompo Indonesia; e-mail : mfahreza@unpatompo.ac.id

Jl. Inspeksi Kanal Citraland No. 10 Kec. Rappocini. Kel. Tambolo. Kota Makassar. 90233.

* Corresponding Author : Wawan Kurniawan

Abstract: This study explores the role of principal leadership style in shaping the quality of 21st-century teaching skills among elementary school teachers in Indonesia, with particular attention to leadership practices, challenges encountered, and strategies for improvement. Using a descriptive qualitative approach, the research was conducted at SD Negeri 90 Sampulungan, Takalar, South Sulawesi, involving the principal and teachers as participants. Data were gathered through in-depth interviews, direct observations, and documentation to provide a comprehensive understanding of the phenomenon. The findings indicate that the principal primarily employed transformational and democratic leadership styles. These approaches motivated teachers by inspiring them with clear visions, serving as role models, and encouraging active participation in decision-making processes. Such leadership practices contributed significantly to teacher engagement and the overall school climate. Teachers, in turn, demonstrated competencies aligned with 21st-century learning demands, particularly through the application of the 4Cs: critical thinking, creativity, communication, and collaboration. They also showed efforts in integrating information and communication technology (ICT) into their teaching practices and implementing interactive classroom management strategies. However, several challenges were identified, including limited availability of facilities, resistance among some teachers toward adopting innovative methods, and the heavy administrative workload that often distracted from instructional focus. To address these issues, the principal implemented various strategies such as organizing continuous professional development training, providing close supervision and mentoring, and offering motivational support to sustain teacher commitment. Overall, the study emphasizes the crucial role of transformational leadership in strengthening teachers' 21st-century skills and offers practical implications for educational policy development, while also recommending future studies across broader school contexts in Indonesia.

Keywords: 21st-Century Skills; Educational leadership; Elementary Education; Indonesia; Principal Leadership.

1. Introduction

The twenty-first century has introduced increasingly complex challenges for education systems worldwide, particularly in preparing future generations to compete in the era of globalization. Rapid advancements in technology, information, and communication demand that schools produce graduates who are not only academically proficient but also equipped with essential twenty-first-century competencies. These competencies include critical thinking, creativity, collaboration, communication, and digital literacy (MY et al., 2023). Such skills are regarded as core requirements for navigating modern society, where learners

Received: August 15, 2025

Revised: August 30, 2025

Accepted: September 20, 2025

Online Available: September 22, 2025

Curr. Ver.: September 22, 2025



Copyright: © 2025 by the authors.
Submitted for possible open access publication under the terms and conditions of the Creative Commons Attribution (CC BY SA) license (<https://creativecommons.org/licenses/by-sa/4.0/>)

are expected to adapt, innovate, and actively participate in social and professional life. Consequently, the urgency to foster twenty-first-century skills has moved beyond rhetoric, becoming a critical agenda in educational policy and practice across countries.

Within this global transformation, teachers occupy a strategic position. They are no longer limited to delivering subject matter but are increasingly required to act as facilitators, motivators, counselors, and innovators capable of designing engaging and collaborative learning experiences. This transformation demands continuous professional development to ensure teachers are capable of supporting students' acquisition of twenty-first-century skills. However, teachers' competencies are heavily influenced by the role of principals, who function as educational leaders at the school level. Principals are not only administrators but also managers, supervisors, and instructional leaders with a direct impact on improving teaching quality (Jusmawati et al., 2024). Accordingly, the leadership style of principals plays a pivotal role in motivating, guiding, and empowering teachers to align with twenty-first-century educational demands (Mulyasa, 2014).

Research on school leadership has consistently demonstrated its importance in improving teacher quality and professional practice. For instance, Salmia et al. highlighted that principals' leadership could strengthen teachers' professionalism through technical guidance, workshops, and systematic supervision (Salmia et al., 2020). Similarly, Iskandar found that transformational leadership significantly influences educational quality by inspiring teachers, encouraging innovation, and integrating twenty-first-century skills into the curriculum (S. Iskandar, 2023). These findings emphasize that school principals are more than administrative figures; they are agents of change who shape teacher practices and prepare students for modern challenges.

Despite these insights, much of the existing research has approached school leadership in general terms, without adequately examining its connection to teachers' twenty-first-century competencies at the primary education level. Prior studies have often emphasized managerial effectiveness or overall school performance, while the specific relationship between principals' leadership styles and the development of twenty-first-century teaching practices remains underexplored, especially in rural or less-urbanized contexts in Indonesia. Addressing this gap is crucial, as empirical evidence from localized school settings can provide practical insights into how leadership fosters or constrains teachers' adoption of twenty-first-century skills.

In Indonesia, the urgency of this research is reflected in ongoing educational reforms. The government has introduced the *Kurikulum Merdeka* (Independent Curriculum), which explicitly requires teachers to develop critical thinking, foster innovation, and integrate digital tools into learning. Nevertheless, implementation faces challenges, particularly in primary schools located in rural areas. Limited technological resources, unequal teacher competencies, and entrenched traditional teaching cultures often impede meaningful transformation. In this context, principals are expected to act as central figures who can mentor, motivate, and provide supportive environments for teachers. Thus, principals' leadership is not simply about resource management but about ensuring that the vision of twenty-first-century education is realized at the school level.

SD Negeri 90 Sampulungan, located in Galesong Utara, Takalar, South Sulawesi, provides a relevant case study for this issue. Recognized as one of the leading schools in its district, it has demonstrated strong performance in management, teaching quality, and resource utilization. Much of this success is attributed to its principal, who has played a multifaceted role as a manager, supervisor, and humanistic leader. Rather than limiting leadership to administrative duties, the principal has embraced participatory practices, such as fostering positive teacher interactions, conducting regular monitoring of teaching activities, and cultivating a collaborative school climate. This human-centered leadership has positively shaped relationships within the school community, marked by open communication, mutual respect, and professional recognition.

At the same time, the experiences of SD Negeri 90 Sampulungan illustrate the dual nature of leadership in advancing twenty-first-century teaching. Teachers at the school have implemented competencies such as the 4Cs, ICT integration, and interactive classroom management. However, they continue to face barriers, including insufficient digital infrastructure, resistance from some teachers toward innovation, and heavy administrative workloads. The principal has responded to these issues through a combination of strategies, including continuous training programs, supervision, mentoring, motivation, and recognition. These practices highlight how leadership style serves not only as a guiding force but also as a mechanism to overcome structural and cultural barriers to twenty-first-century education.

Given this background, the present study is both theoretically and practically significant. Theoretically, it aims to fill a gap in the literature by offering empirical evidence on the relationship between principals' leadership styles and teachers' twenty-first-century skills within the primary education context. Practically, the study is expected to provide guidance for school leaders in adopting more effective leadership styles, for teachers in strengthening professional practices, and for policymakers in designing educational programs that better support twenty-first-century skill development. Specifically, the objectives of this study are three-fold: (1) to describe the role of principals' leadership styles; (2) to examine their influence on teachers' twenty-first-century teaching competencies; and (3) to identify the challenges and solutions related to leadership in advancing twenty-first-century skills.

Overall, this study seeks to contribute to the broader discourse on educational leadership and teacher competence in the digital era. By focusing on a primary school context in Indonesia, the research provides localized insights that may be applicable to other developing country contexts with similar challenges. The findings are expected to strengthen the theoretical understanding of transformational and democratic leadership in education while offering practical recommendations for enhancing teaching quality and aligning teacher practices with twenty-first-century learning goals. In doing so, the study reaffirms the critical role of principals as catalysts for change in equipping teachers to meet the evolving demands of global education.

2. Preliminaries or Related Work or Literature Review

School Leadership

Leadership is widely defined as a process of influencing and guiding others toward achieving collective goals. In the educational context, the principal serves as the highest leader who integrates managerial, pedagogical, and social roles to ensure school effectiveness (Nursidah et al., 2022; Yulk, 2013). A principal's leadership style significantly shapes teacher performance and organizational culture, making it central to school improvement. Prior studies indicate that effective leadership not only involves administrative tasks but also the ability to motivate, supervise, and inspire teachers to embrace professional development (Salmia et al., 2020).

Leadership Styles in Education

Scholars have identified several leadership styles relevant to school contexts, including authoritarian, democratic, laissez-faire, transactional, transformational, and instructional approaches. Authoritarian leaders emphasize strict control and efficiency but often hinder teacher creativity (Usman, 2009). Democratic leadership encourages participation and fosters commitment but may slow decision-making (Aliyyah et al., 2019). Laissez-faire leadership offers autonomy yet risks lack of direction (Yulk, 2013). Transactional leadership ensures discipline through reward and punishment but fails to stimulate innovation (Aminah et al., 2024). In contrast, transformational leadership, which emphasizes vision, inspiration, and motivation, has been shown to drive teacher creativity, innovation, and twenty-first-century readiness (A. Iskandar et al., 2023; Stufflebeam & Coryn, 2014). Instructional leadership, with its focus on supervision and curriculum, further strengthens teaching quality by directly addressing classroom practices (Sartika, 2023).

Twenty-First-Century Teacher Competencies

Twenty-first-century skills are globally recognized as essential competencies for navigating the challenges of the digital era and knowledge-based society. The Partnership for 21st Century Learning (P21) framework emphasizes the "4Cs"—critical thinking, creativity, communication, and collaboration—as foundational competencies (Belyaeva et al., 2022; Todorova, 2024). Teachers are thus required not only to master content but also to integrate technology, foster collaboration, and nurture students' emotional intelligence (Rahayu et al., 2023). In Indonesia, these skills are emphasized in national curricula, including the Kurikulum Merdeka, which aims to prepare students for Industry 4.0 and Society 5.0 challenges.

Dimensions of Twenty-First-Century Teaching

The dimensions of twenty-first-century teaching skills include: (1) critical thinking and problem-solving, which enable teachers to design reflective and analytical learning experiences (Khatib, 2023); (2) creativity and innovation, which foster novel pedagogical approaches and encourage students to generate original ideas (Darmuki et al., 2023; Yusni et al., 2024); (3) communication skills, which ensure effective teacher-student interactions and clarity in learning (Vasiliauskiene et al., 2005); and (4) collaboration skills, which support teamwork among students and teachers, creating a culture of shared responsibility. Collectively, these competencies transform teachers into facilitators, motivators, and innovators who prepare students for the demands of a globalized world.

Linking Leadership and Twenty-First-Century Teaching

Previous research has established that school leadership plays a crucial role in shaping teachers' pedagogical practices. Transformational and democratic leadership styles, in particular, are associated with enhanced teacher motivation, innovation, and professional growth (Sundari et al., 2021). However, most studies remain general in scope, focusing on leadership and school outcomes without explicitly examining the nexus between principals' leadership styles and teachers' twenty-first-century skills. Moreover, research in rural and developing contexts such as Indonesia remains limited.

3. Proposed Method

This study adopted a descriptive qualitative design to explore how principals' leadership styles influence the development of teachers' twenty-first-century skills. A qualitative approach was considered appropriate because it provides opportunities to capture participants' lived experiences in depth and to interpret the meanings behind their practices in natural contexts rather than producing statistical generalizations. The research was conducted at SD Negeri 90 Sampulungan, a public primary school located in Galesong Utara, Takalar, South Sulawesi, Indonesia. The school was purposively selected due to its reputation as a leading institution in the district and its consistent efforts in promoting teacher competence development in line with twenty-first-century educational demands. Participants consisted of the school principal and a group of purposively selected teachers who were actively engaged in teaching, involved in school programs, and considered capable of providing rich information regarding 4C practices, ICT integration, interactive classroom management, and their roles as facilitators, motivators, and inspirers for students.

Data were collected over a three-month period, from July to September 2025, using three complementary techniques: semi-structured interviews, classroom and school observations, and document analysis. Interviews were conducted with the principal and teachers to obtain insights into leadership practices, classroom experiences, and challenges in developing twenty-first-century skills. Observations were carried out to directly capture leadership behaviors and teachers' classroom activities, while document analysis focused on school profiles, work programs, supervision records, activity reports, and curriculum materials. The use of multiple data sources enabled methodological triangulation to strengthen the validity of findings. The researcher acted as the primary instrument, while auxiliary tools were developed to support data collection. These included an interview guide containing open-ended prompts on leadership and twenty-first-century competencies, an observation checklist to record leadership behaviors and classroom practices, and a documentation sheet to systematically log school records and artifacts. These instruments ensured that the data obtained were both consistent and comprehensive.

Data analysis followed the Miles, Huberman, and Saldaña (2014) interactive model, which consists of three stages: data reduction, data display, and conclusion drawing/verification. In the reduction stage, interview transcripts, observation notes, and documents were coded and grouped into thematic categories such as transformational leadership, teacher motivation, 4C pedagogy, and ICT integration. Data were then displayed in narrative summaries, thematic matrices, and illustrative quotations, which allowed the identification of patterns and relationships between leadership styles and teacher competencies. Finally, conclusions were drawn and continuously verified by comparing emerging categories, revisiting data, and refining interpretations throughout the research process.

The trustworthiness of the findings was established through Lincoln and Guba's (1985) criteria. Credibility was ensured through triangulation of sources, techniques, and time, as well

as member checks with participants. Transferability was supported by providing thick descriptions of the research context, while dependability was maintained through an audit trail of procedures and analytical decisions. Confirmability was strengthened by reflexive memos and the systematic preservation of raw data such as transcripts and field notes, ensuring that the findings were grounded in the participants' perspectives rather than researcher bias.

Ethical considerations were carefully observed throughout the study. Informed consent was obtained from all participants prior to data collection, and they were assured of voluntary participation with the right to withdraw at any time. Data were anonymized, securely stored, and reported in aggregate to protect confidentiality. The overall research timeline spanned three months, during which data collection, analysis, and verification were conducted simultaneously to ensure depth and rigor in the findings.

4. Results and Discussion

Research Result

The findings of this study are presented according to the three main foci of inquiry: (1) the role of the principal's leadership style, (2) the quality of teachers' twenty-first-century skills, and (3) the challenges and solutions in implementing such leadership at SD Negeri 90 Sampulungan, Galesong Utara, Takalar.

The Role of the Principal's Leadership Style

The results demonstrate that the principal plays a central role in shaping a positive school climate through a leadership approach that combines transformational, democratic, transactional, and situational elements. First, the principal acted as a direction-setter by consistently articulating the school's vision and mission, ensuring that teachers internalized these values and aligned their lesson plans with institutional goals. Teachers emphasized that the principal not only explained the vision and mission but also operationalized them in concrete guidance, such as the preparation of lesson plans and curriculum alignment.

Second, the principal provided motivation and inspiration through recognition of teacher achievements, opportunities for professional development, and modeling exemplary behavior. Teachers reported feeling encouraged to innovate because of the principal's encouragement, supervision, and provision of training. Third, role modeling in discipline and integrity was evident in punctuality, compliance with administrative regulations, fairness in sanctions, and transparency in financial management, all of which built trust among staff.

Fourth, the principal fostered participation and open communication by involving teachers in key decision-making processes related to curriculum, budgeting, and school programs. Teachers highlighted that decision-making was largely consultative, supported by transparent communication channels through meetings and digital platforms. Finally, supervision and evaluation were conducted systematically, beginning with classroom observations and administrative checks, followed by formative feedback that emphasized positive reinforcement before corrective advice.

Overall, the principal's leadership style was predominantly transformational and democratic, characterized by vision, inspiration, and participatory practices, while transactional elements ensured discipline and accountability, and situational adjustments accommodated different teacher profiles.

The Quality of Teachers' Twenty-First-Century Skills

Teachers at SD Negeri 90 Sampulungan demonstrated substantial efforts in integrating twenty-first-century skills into their pedagogy. The findings indicate that critical thinking was fostered through the use of higher-order questioning, open-ended discussions, and real-world contextualization. Creativity was promoted by designing project-based learning activities, providing safe spaces for experimentation, and giving constructive feedback to support student confidence. Communication was cultivated through frequent opportunities for presentations, debates, and classroom dialogues, alongside attention to respectful interaction and listening skills. Meanwhile, collaboration was encouraged through group projects, cooperative learning, and task-based simulations that required teamwork and shared responsibility.

The study also revealed that ICT integration has become a crucial dimension of teaching practice. Teachers utilized digital presentations (e.g., PowerPoint, Canva), videos, interactive applications, and mobile devices to enrich classroom activities. Beyond technology, they also

applied cross-disciplinary integration, linking lesson content with social and real-life contexts to enhance relevance and meaningful learning.

Classroom practices reflected a balance between interactive and collaborative learning environments. Teachers created participatory spaces through discussions, educational games, and inquiry-based activities while maintaining order through agreed-upon class rules. In addition, they consistently sought to sustain student motivation by contextualizing lessons, employing diverse teaching methods, providing rewards, and creating supportive classroom atmospheres. Teachers also embraced their roles as facilitators, motivators, and inspirers, guiding students toward independent learning, offering encouragement in times of difficulty, and serving as role models in adopting innovative practices.

Challenges and Solutions in Leadership Implementation

Despite these positive practices, both internal and external challenges were identified. Internal challenges included limited ICT infrastructure, uneven teacher competence in digital pedagogy, resistance among some teachers to adopt innovative methods, heavy administrative workloads that reduced creative preparation time, and generally passive learning habits among students. External challenges were associated with unequal distribution of government training programs and technological support, as well as entrenched school cultures that favored traditional methods over innovative ones.

To address these challenges, the principal implemented several strategies. Capacity building was strengthened through regular training, workshops, and professional learning communities, supported by supervision and mentoring to ensure transfer of learning into classroom practice. Recognition and motivational strategies were applied through verbal and written appreciation, small incentives, and acknowledgment of teacher achievements. In addition, the principal cultivated a supportive and communicative work environment, encouraging open dialogue and collaboration among staff. Looking forward, teachers emphasized the importance of sustained training, digital innovation, and stronger external collaborations with universities, educational organizations, and industry partners. Providing adequate ICT facilities and reliable internet access was also considered essential to sustaining twenty-first-century pedagogy.

Discussion

The discussion of this study highlights the role of the principal's leadership style in enhancing the quality of twenty-first-century skills among teachers at SD Negeri 90 Sampulungan, Takalar. It further examines the contextual practices of 21st century pedagogy, identifies internal and external challenges, and explores strategies and solutions developed by the school principal to maintain learning quality. The analysis is structured around three central themes.

The Role of the Principal's Leadership Style

The findings confirm that the principal exercised a central role in directing teachers and aligning classroom practices with the broader vision and mission of the school. Guidance was consistently linked to the school's long-term goals of producing competitive and high-quality graduates. As one teacher stated, "*Araban kepala sekolah selalu dikaitkan dengan visi dan misi sekolah, terutama mencetak siswa berkualitas dan berdaya saing*" (Informant 1). This finding resonates with Mustaghfirin et al. (2024), who argue that effective principals ensure clarity and consistency in translating institutional vision into classroom strategies.

Beyond direction, the principal functioned as a motivator and inspirer. Teachers emphasized that recognition extended beyond certificates to more meaningful support such as professional training opportunities: "*Guru berhasil meningkatkan hasil belajar siswa, kepala sekolah memberikan apresiasi langsung dan kesempatan pelatihan*" (Informant 6). Such practices reflect the characteristics of transformational leadership, where recognition and modeling inspire continuous innovation (Erlisa, 2024). The principal also demonstrated role modeling through discipline, fairness, and transparency, which reinforced trust among teachers. Transparency in financial management and consistent discipline mirrored prior findings that link integrity with institutional credibility (Mulyasa, 2023; Salim, 2016).

Communication patterns were open and participatory, with teachers actively involved in decision-making processes. Meetings, both formal and informal, created democratic spaces for consultation: "*Kepala sekolah mengajak guru rapat bersama sebelum mengambil keputusan*" (Informant 3). This supports Zahria (2024), who highlights participatory leadership as a catalyst for professional ownership among teachers. Moreover, supervision and evaluation were im-

plemented systematically. The principal not only observed lessons and administrative compliance but also applied a feedback model that emphasized appreciation before constructive correction, creating a non-threatening supervisory culture (Merlita et al., 2023).

Taken together, the leadership style at SD Negeri 90 Sampulungan was predominantly transformational and democratic, complemented by transactional elements of reward and sanctions, and situational adaptations tailored to senior or novice teachers. This adaptive approach illustrates holistic leadership capable of fostering an innovative and professional school environment.

Teachers' Twenty-First-Century Skills

Teachers' professional practices were strongly aligned with the 4C framework (critical thinking, creativity, communication, and collaboration). Teachers routinely promoted critical thinking by employing higher-order questioning and real-world contextualization: "*Guru menggunakan pertanyaan terbuka, mendorong diskusi dan debat, menganalisis studi kasus*" (Informant 4). This aligns with Nurmansyah (2022), who underscores the role of inquiry and case-based learning in cultivating reasoning skills.

Creativity was fostered by creating safe environments for experimentation and project-based learning. Teachers noted that students were encouraged to take risks and explore innovative solutions: "*Guru menciptakan lingkungan yang mendukung eksperimen dan pengambilan risiko tanpa takut salah, menggunakan metode berbasis proyek dan kolaboratif*" (Informant 4). This practice reflects the findings of Mustriyal & Azhar (2024), which emphasize creativity as a product of supportive and appreciative learning contexts.

Communication was strengthened through structured opportunities such as debates and presentations, while collaboration was embedded in group projects and cooperative tasks: "*Meliputi proyek kelompok, seperti melakukan survei lingkungan atau membuat proyek sains*" (Informant 4). These approaches echo Afridaini et al. (2024), who identify interactive and project-based learning as effective in fostering communication and teamwork.

Integration of ICT further enriched learning experiences. Teachers incorporated digital presentations, interactive applications, and contextual cross-disciplinary approaches to enhance relevance: "*Menghubungkan materi dengan kondisi sosial ekonomi, misalnya IPS dengan sains maupun seni*" (Informant 5). This mirrors Aini (2022), who argues that combining technology with contextualization ensures meaningful learning outcomes.

Additionally, teachers adopted diverse strategies to sustain student motivation, including contextualizing content, employing varied teaching methods, and using reward systems. As highlighted by Informant 6, "*Dengan memberi reward, memberikan pujian yang sesuai, pemberian penghargaan yang mendorong siswa.*" Such findings are consistent with Asriani et al. (2024) and Wahyuningsih et al. (2024), who emphasize the importance of combining intrinsic and extrinsic motivators. Ultimately, teachers' roles as facilitators, motivators, and inspirers were clearly visible, guiding students towards independence while modeling resilience and creativity.

Challenges and Solutions in Leadership Implementation

Despite these advances, several internal and external challenges were identified. Internally, the most pressing issue was limited infrastructure, particularly ICT devices, laboratories, and internet connectivity: "*Koneksi yang lemah dan tidak fleksibel dapat menjadi penghalang implementasi pembelajaran berbasis keterampilan abad 21*" (Informant 5). Teachers also highlighted uneven competencies and resistance toward digital pedagogy: "*Ada guru yang enggan memakai teknologi digital karena merasa sulit atau tidak terbiasa*" (Informant 2). Administrative burdens further reduced teachers' time to prepare creative lessons, reflecting broader concerns raised by Mansor & Jamaludin (2024).

Externally, although government programs provided teacher training and ICT support, distribution remained uneven. As noted, "*Pemerintah sudah memberikan program pelatihan guru dan bantuan sarana TIK, namun pelaksanaannya belum merata*" (Informant 3). Cultural barriers also persisted, with some teachers preferring traditional methods over innovative practices (Hendriani et al., 2022; Zahurin et al., 2024).

In response, the principal employed several solutions. Capacity-building was prioritized through training and workshops, supported by continuous supervision and mentoring: "*Kepala sekolah konsisten melaksanakan program kegiatan pelatihan dan workshop keterampilan abad 21*" (Informant 1). Motivation was reinforced with appreciation and verbal encouragement, while collaborative cultures were nurtured through positive communication and supportive work environments. Looking forward, sustainable strategies were identified, including ongoing

ing professional development, teacher learning communities, external partnerships with universities and NGOs, and classroom digitalization. As Informant 1 emphasized, “*Solusinya separati pelatihan rutin, komunitas belajar, pemanfaatan teknologi, ruang inovasi, apresiasi, kolaborasi eksternal, dan evaluasi berkala.*”

These findings suggest that the principal’s leadership at SD Negeri 90 Sampulungan embodies a transformational and adaptive model, balancing capacity-building, digital innovation, and collaborative culture to overcome systemic challenges. Such strategies resonate with international scholarship that links effective leadership with teacher empowerment and sustainable educational improvement.

5. Comparison

The findings of this study reveal both similarities and distinctions when compared with previous research on school leadership and the development of 21st-century teacher competencies. In line with Iskandar (2023) and Erlisa (2024), the results confirm that transformational leadership plays a critical role in motivating teachers, fostering innovation, and aligning teaching practices with institutional goals. At SD Negeri 90 Sampulungan, this leadership style was evident in the principal’s ability to inspire through role modeling, reward systems, and open communication, which mirrors global perspectives that emphasize transformational leadership as a driver of educational change (Bass & Avolio, 1994). However, unlike studies that predominantly focus on transformational leadership alone, this research highlights the multi-faceted nature of leadership practices. The principal not only employed transformational strategies but also incorporated democratic and situational approaches, ensuring teacher involvement in decision-making while adapting leadership style to the needs of novice and senior teachers. This adaptive pattern extends prior findings by Zahria (2024), who emphasized participatory leadership, by demonstrating how democratic participation can coexist with transactional mechanisms such as sanctions and rewards.

In terms of teacher competencies, the findings strongly align with the 4C framework promoted by P21 (Partnership for 21st Century Learning) and supported by Nurmansyah (2022) and Musrizal & Azhar (2024), showing that critical thinking, creativity, communication, and collaboration can be effectively cultivated through inquiry-based, project-based, and technology-enhanced learning. Yet, this study adds empirical evidence from a rural Indonesian context, demonstrating that even schools with limited resources can implement 4C pedagogy when guided by strong leadership. This contrasts with Afridaini et al. (2024), who found that inadequate ICT often hindered collaboration and creativity; in the present study, although infrastructure was limited, leadership strategies such as teacher mentoring and workshop facilitation mitigated those constraints. Furthermore, while prior literature often highlights policy-level constraints (Septiyanti et al., 2023; Zahurin et al., 2024), this study underscores how school-level leadership practices—including continuous supervision, appreciation, and the creation of teacher learning communities—can serve as counterbalances to systemic challenges. This represents a key distinction: instead of framing infrastructural and cultural barriers as immovable, the findings here suggest that adaptive leadership can partially offset these limitations by fostering motivation and building collaborative professional cultures. In summary, this study corroborates existing research regarding the importance of transformational and democratic leadership in enhancing 21st-century teacher skills. At the same time, it extends the literature by illustrating a hybrid leadership model that integrates transformational, democratic, transactional, and situational dimensions, and by presenting empirical evidence from an underexplored rural Indonesian setting. These contributions enrich the broader discourse on educational leadership, teacher empowerment, and the localized implementation of 21st-century learning.

6. Conclusions

This study concludes that the leadership of the principal at SD Negeri 90 Sampulungan plays a decisive role in shaping the quality of teachers’ 21st-century skills. The findings demonstrate that the principal predominantly adopts a transformational and democratic leadership style, complemented by transactional and situational elements. Through vision-setting, motivation, role modeling, participatory decision-making, and continuous supervision, the principal fosters a school climate that is transparent, collaborative, and innovation-oriented.

Teachers, in turn, have successfully implemented various dimensions of 21st-century competencies, particularly the 4Cs (Critical Thinking, Creativity, Communication, and Collaboration), digital integration in teaching, interactive and collaborative classrooms, and the cultivation of student motivation. Moreover, teachers consistently assume roles as facilitators, motivators, and inspirators, ensuring that learning is student-centered, engaging, and contextually relevant. Nevertheless, several internal challenges persist, including limited ICT facilities, unequal teacher competencies, resistance to innovation, and heavy administrative workloads. At the same time, external barriers such as uneven implementation of government policies and entrenched traditional school cultures remain significant obstacles. Despite these constraints, the principal has employed strategic interventions—such as continuous training, mentoring, motivational reinforcement, and constructive supervision—to sustain teacher performance and innovation.

References

- Aliyyah, R. R., Mulyadi, D., Widyasari, & Kholik, A. (2019). *Manajemen lembaga pendidikan* (1st ed., Vol. 10, Issue 1). Polime-dia Publishing.
- Aminah, S., Sari, F. N. K., & Hasanah, S. Z. (2024). Strategi kepala sekolah dalam meningkatkan kompetensi siswa di SD Baiturrahman Jember. *Jurnal Visionary: Penelitian dan Pengembangan di Bidang Administrasi Pendidikan*, 12(1), 126. <https://doi.org/10.33394/vis.v12i1.9290>
- Belyaeva, T., Levanskaya, N. M., & Nikitina, L. (2022). 21st century skills in teaching. <https://doi.org/10.46646/sakh-2022-1-159-162>
- Darmuki, A., Hidayati, N. A., Tanghal, A. B., & Esteban, A. M. Jr. (2023). Pengembangan dan keefektifan model buku teks mata kuliah strategi pembelajaran berbasis pendekatan kontekstual. *Kembara: Jurnal Keilmuan Bahasa, Sastra, dan Pengajarannya*, 9(1), 223–238. <https://doi.org/10.22219/kembara.v9i1.22635>
- Iskandar, A., Winata, W., Kurdi, M. S., Sitompul, P. H. S., Nurhayati, S., Hasanah, M., & Haluti, F. (2023). *Peran teknologi dalam dunia pendidikan*. Yayasan Cendekiawan Inovasi Digital Indonesia.
- Iskandar, S. (2023). Kepemimpinan transformasional kepala sekolah dalam pembelajaran abad 21 di sekolah dasar. *Jurnal Elementaria Edukasia*, 6(2), 287–297. <https://doi.org/10.31949/jee.v6i2.5484>
- Jusmawati, J., Baharuddin, I., Mahdi, M., & W., M. F. (2024). Pengembangan pendidikan karakter dan profil pelajar Pancasila berwawasan kearifan lokal. *Jurnal Education and Development Institut Pendidikan Tapanuli Selatan*, 12(1), 1–7.
- Khatib, M. M. El. (2023). Design thinking skills for senior managers from business and technology perspectives. *International Journal of Business and Applied Sciences*, 3(1), 56–73. <https://doi.org/10.54489/ijbas.v3i1.197>
- Mulyasa, E. (2014). *Manajemen berbasis sekolah: Konsep, strategi dan implementasi* (15th ed.). PT. Remaja Rosdakarya.
- MY, N., Nurlina, N., & Ma'ru'f, M. (2023). Analysis of critical thinking skills of elementary school students through integrated problem-based learning model with mind mapping. *EDUKASIA: Jurnal Pendidikan dan Pembelajaran*, 4(2), 1373–1380. <https://doi.org/10.62775/edukasia.v4i2.445>
- Nursidah, N., Yunus, M., & Elpisah, E. (2022). Pengaruh supervisi akademik kepala sekolah dan budaya sekolah terhadap mutu mengajar guru. *Jurnal Pendidikan Ekonomi (JUPE)*, 10(1), 38–44. <https://doi.org/10.26740/jupe.v10n1.p38-44>
- Rahayu, R., Iskandar, S., & Kurniawan, D. T. (2023). Karakteristik keterampilan guru abad 21. *Caruban: Jurnal Ilmiah Ilmu Pendidikan Dasar*, 6(1), 89. <https://doi.org/10.33603/caruban.v6i1.8018>
- Salmia, S., Rosleny, R., & Idawati, I. (2020). Kepemimpinan kepala sekolah menuju pembelajaran abad 21. *Indonesian Journal of Primary Education*, 4(1), 1–10. <https://doi.org/10.17509/ijpe.v4i1.22362>

- Sartika, D. (2023). Role of the principal on teacher pedagogic competence. *Journal of Education Management and Learning Studies*, 1(1), 29–34. <https://doi.org/10.59653/jemls.v1i01.14>
- Stufflebeam, D. L., & Coryn, C. L. S. (2014). *Evaluation theory, models, and applications* (2nd ed.). Jossey-Bass.
- Sundari, D. H., Iskandar, I., & Muhlis, M. (2021). Penerapan media presentasi classpoint untuk meningkatkan hasil belajar siswa pada mata pelajaran Bahasa Inggris MAN 19 Jakarta. *Jurnal Pemikiran dan Pengembangan Pembelajaran*, 3(3).
- Todorova, S. A. (2024). 21st century skills in the context of education. *Kulturno-Istoričesko Nasledstvo: Opazvane, Predstavane, Digitalizaciá*, 10(1), 101–110. <https://doi.org/10.55630/kinj.2024.100109>
- Usman, H. (2009). *Manajemen teori praktik dan riset pendidikan*. PT. Bumi Aksara.
- Vasiliauskienė, L., Stanikūnienė, B., & Lipinskienė, D. (2005). The employees' competence development inside organization: Managerial solutions. *Engineering Economics*, 45(5), 60–65. <https://doi.org/10.5755/j01.ee.45.5.11341>
- Yukl, G. (2013). *Kepemimpinan dalam organisasi*. PT. Indeks.
- Yusni, D., Sanjaya, Y., Kusnadi, K., Nurhamidah, N., & Azzahra, W. (2024). Analyze the crisis of students' character values and innovative school strategies in overcoming the challenge. *The Eurasia Proceedings of Educational & Social Sciences*, 52–60. <https://doi.org/10.55549/epess.791>