



Instructional Leadership Strategies of School Principals in Promoting Teachers' Instructional Innovation in the Era of Elementary Education Digitalization

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Abstract: This study aims to describe the instructional leadership strategies of school principals in the era of elementary education digitalization, to describe the forms of teachers' instructional innovation in the digital era, and to analyze the supporting and inhibiting factors of principals' instructional leadership at SDN 18 Deteng Deteng. The research employed a qualitative approach with a descriptive design and was conducted at SDN 18 Deteng Deteng. The participants consisted of the principal and teachers, with data collected through observation, interviews, and documentation. Data analysis followed the Miles and Huberman model, which includes data reduction, data display, and conclusion drawing, while data validity was ensured through source and technique triangulation. The findings reveal three main results. First, the principal's instructional leadership strategy was realized through digitally oriented lesson planning, including the formulation of the school's vision-mission and digital lesson plans, routine academic supervision conducted every semester, monitoring and evaluation of learning, and the strengthening of academic culture through continuous teacher professional development. Second, teachers' instructional innovation was reflected in the use of digital technology such as Canva and YouTube, increased pedagogical creativity, strengthened digital literacy, and the implementation of learning that is more adaptive to students' needs. Third, supporting factors for instructional leadership included the principal's commitment, teacher motivation, and the availability of learning facilities, while inhibiting factors included limited technological facilities (a restricted number of LCD projectors), unstable internet connectivity, and uneven digital literacy among teachers. The study concludes that principals' instructional leadership plays a significant role in promoting teachers' instructional innovation, thereby enhancing the quality of learning to become more creative, effective, and aligned with the demands of 21st-century education.

Keywords: instructional leadership; school principal, teachers' instructional innovation; digitalization of elementary education

Abstrak: Penelitian ini bertujuan untuk mendeskripsikan strategi kepemimpinan instruksional kepala sekolah di era digitalisasi pendidikan sekolah dasar, mendeskripsikan bentuk inovasi pembelajaran guru dalam era digitalisasi, serta menganalisis faktor pendukung dan penghambat kepemimpinan instruksional kepala sekolah di SDN 18 Deteng Deteng. Penelitian menggunakan pendekatan kualitatif dengan desain deskriptif dan dilaksanakan di SDN 18 Deteng Deteng. Informan penelitian terdiri atas kepala sekolah dan guru, dengan teknik pengumpulan data melalui observasi, wawancara, dan dokumentasi. Analisis data menggunakan model Miles dan Huberman yang meliputi reduksi data, penyajian data, dan penarikan kesimpulan, sedangkan keabsahan data diperoleh melalui triangulasi sumber dan teknik. Hasil penelitian menunjukkan tiga temuan utama. Pertama, strategi kepemimpinan instruksional kepala sekolah diwujudkan melalui perencanaan pembelajaran yang berorientasi digital berupa penyusunan visi-misi sekolah dan RPP digital, supervisi akademik yang dilaksanakan secara rutin setiap semester, monitoring dan evaluasi pembelajaran, serta penguatan budaya akademik melalui pengembangan profesional guru secara berkelanjutan. Kedua, bentuk inovasi pembelajaran guru tampak dari pemanfaatan teknologi digital seperti Canva dan YouTube, peningkatan kreativitas pedagogik guru, penguatan literasi digital, serta penerapan pembelajaran yang lebih adaptif terhadap kebutuhan siswa. Ketiga, faktor pendukung kepemimpinan instruksional meliputi komitmen kepala sekolah, motivasi guru, dan ketersediaan sarana pembelajaran, sedangkan faktor penghambat mencakup keterbatasan sarana teknologi (jumlah LCD proyektor yang terbatas), jaringan internet yang belum stabil, serta literasi digital guru yang belum merata. Kesimpulan penelitian menegaskan bahwa kepemimpinan instruksional kepala sekolah berperan signifikan dalam mendorong inovasi pembelajaran guru, sehingga kualitas pembelajaran dapat ditingkatkan agar lebih kreatif, efektif, dan sesuai dengan tuntutan pendidikan abad ke-21.

Kata kunci: kepemimpinan instruksional; kepala sekolah; inovasi pembelajaran guru; digitalisasi Pendidikan dasar

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Introduction

Education is a fundamental right of every Indonesian citizen, as mandated by Article 31(1) of the 1945 Constitution of the Republic of Indonesia, which stipulates that every citizen has the right to education. Article 31(3) further mandates the government to establish and administer a national education system aimed at enhancing faith, religious devotion, and noble character as part of the effort to educate the nation. This constitutional mandate is further elaborated in Law No. 20 of 2003 on the National Education System. Article 3 of the Law stipulates that national education serves to develop individuals' capacities and shape the character and civilization of the nation with dignity. Within this context, school principals play a strategic role as educational leaders responsible for translating these constitutional mandates into educational practices at the school level. One important manifestation of this role is instructional leadership, which encourages teachers to develop innovative learning practices in response to the growing demands of educational digitalization.

The digitalization of education requires elementary school principals to exercise adaptive instructional leadership by becoming directly involved in supporting and improving instructional processes rather than focusing solely on administrative management (Hermawan et al., 2026). However, this role has not yet been optimally implemented in practice, resulting in persistent challenges for teachers in developing technology-based learning innovations in a consistent and equitable manner (Lestari et al., 2025). This situation is evident at SDN 18 Deteng Deteng. The school has 19 teaching staff members, comprising civil servant teachers, government contract teachers (P3K), part-time teachers, and honorary teachers, who serve 156 students across six classes. Initial observations indicate that some teachers have begun incorporating digital media, such as Canva and instructional videos from YouTube, particularly in the Science and Social Studies (IPAS) subject. Nevertheless, teachers' levels of digital competence vary considerably. Some teachers have primarily mastered Canva, while other digital applications remain challenging to use. The principal has conducted academic supervision at least once each semester; however, supporting facilities remain limited. Only two LCD projectors are available for six classrooms, requiring teachers to share the equipment on a rotating basis. In addition, the school's internet connection is frequently unstable.

The findings from preliminary interviews further reinforce these observations. The principal of SDN 18 Deteng Deteng (TD) stated that "the main challenge is time. Administrative responsibilities often overlap with the supervision schedule, so

instructional support cannot always be provided optimally." Similarly, one of the teachers (PW) explained that "the biggest obstacle is the facilities. There are only two LCD projectors, so we have to take turns using them. The internet is also frequently unstable, so when we want to show videos from YouTube, the connection sometimes gets interrupted." This phenomenon indicates that the gap between the expectation of adaptive instructional leadership in response to educational digitalization and the realities in the field is not solely attributable to teachers' readiness. It is also influenced by limited time for instructional support and inadequate supporting infrastructure.

Previous studies on principals' instructional leadership have generally employed quantitative approaches to examine relationships among variables in broad terms (Prasrihamni et al., 2022; Syahrizi & Ramli, 2025). Other studies have examined educational digitalization more generally without providing an in-depth exploration of how principals' strategies are implemented and supported in actual school settings (Ampy et al., 2025). These studies have not sufficiently explained how instructional support processes are carried out amid constraints in time and infrastructure, nor how school principals respond contextually to differences in teachers' levels of digital competence. Based on the researchers' review of the existing literature, no study has specifically examined the instructional leadership strategies employed by an elementary school principal to promote teachers' learning innovation through

Method

Research Design and Setting

This study employed a qualitative approach using a case study design. A qualitative approach was selected because the study aimed to gain an in-depth understanding of the instructional leadership practices of a school principal in promoting teacher learning innovation in the context of educational digitalization. The phenomenon under investigation involves meanings, contextual factors, and participants' subjective interpretations that are more appropriately explored qualitatively than measured numerically. Creswell (2014) describes qualitative research as an approach for exploring and understanding the meanings individuals or groups attribute to social or human problems. This approach enabled the researchers to explore the meanings, strategies, and leadership practices implemented by the school principal from the perspectives of the participants and within the natural school setting.

A case study design was selected because the research focused on a single research site, SDN 18 Deteng-Deteng, which was treated as a bounded system examined intensively and comprehensively.

According to Yin (2018), case study research is appropriate when researchers seek to answer “how” or “why” questions concerning contemporary phenomena within real-life contexts, particularly when the boundaries between the phenomenon and its context are not clearly evident. This characteristic corresponds to the research questions, which focus on how the principal’s instructional leadership strategies and teachers’ learning innovations are implemented in practice at SDN 18 Deteng-Deteng. Therefore, a case study design was considered appropriate for comprehensively examining these processes, including the supporting and inhibiting factors encountered in their implementation.

The study was descriptive in nature, seeking to systematically describe and interpret the phenomenon under investigation based on empirical evidence obtained from the field. The data consisted primarily of words, narratives, observations, interview transcripts, and documents rather than numerical measurements. Through this design, the study sought to develop a comprehensive and contextualized understanding of the role of instructional leadership in promoting teacher learning innovation at SDN 18 Deteng-Deteng.

The study was conducted at SDN 18 Deteng-Deteng, located on Jl. Jend. Ahmad Yani KM. 3, Deteng-Deteng, Totoli Urban Village. The site was purposively selected because the school has implemented various instructional leadership practices in responding to the challenges of educational digitalization. In addition, SDN 18 Deteng-Deteng was considered relevant because of its efforts to encourage teachers to develop technology-based learning innovations.

The research was conducted over approximately three months, covering the preparation stage, field data collection, data analysis, and conclusion development. The study was carried out during the second semester of the current academic year, with the research schedule adjusted to the school’s activities to minimize disruption to the teaching and learning process.

The selection of the research setting and duration was intended to provide sufficient opportunities for the researchers to obtain relevant, accurate, and in-depth data concerning the implementation of instructional leadership and teacher learning innovation in the school.

Participants, Sample, or Data Sources

The study was conducted at SDN 18 Deteng-Deteng, located on Jl. Jend. Ahmad Yani KM. 3, Deteng-Deteng, Totoli Urban Village. The site was purposively selected because the school has implemented various instructional leadership practices in responding to the challenges of

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The study utilized both primary and secondary data sources. Primary data were obtained directly from research participants selected through purposive sampling, in which participants were deliberately selected based on criteria relevant to the research focus (Sugiyono, 2019). The participant selection criteria were: (1) direct involvement in the implementation or experience of instructional leadership practices at the school; (2) sufficient teaching and/or professional experience to understand the development of technology-based learning practices at the school; and (3) willingness to provide information openly and participate in follow-up interviews when clarification was required.

Based on these criteria, three participants were involved in the study:

The principal of SDN 18 Deteng-Deteng, who served as the key informant because of their role as the primary decision-maker and principal implementer of instructional leadership practices at the school.

Two teachers from SDN 18 Deteng-Deteng, who provided complementary perspectives regarding the implementation of digital learning innovations and teachers’ experiences of the principal’s instructional leadership. Data from the teachers were also used to corroborate and cross-check information obtained from the principal.

Secondary data were obtained indirectly from relevant school documents and were used to complement and strengthen the primary data. These documents included the school’s vision and mission statements, the principal’s work programs, academic supervision records, lesson plans or teaching modules, school activity reports, policies related to learning digitalization, photographs, and other relevant administrative records.

Instruments and Measures

In qualitative research, the researcher serves as the primary instrument or *human instrument*. The researcher is responsible for determining the research focus, selecting participants, collecting and analyzing data, and interpreting findings. As the primary instrument, the researcher is also responsible for understanding the context and meanings underlying participants' experiences and statements.

To support systematic data collection, several complementary instruments were used:

Observation Guide

An observation guide was used to systematically record and classify field observations. The guide was developed based on the theoretical indicators of instructional leadership and digital learning innovation presented in the literature review. The observed aspects included academic supervision, the principal's guidance concerning digital learning, monitoring of technology use, academic interactions between the principal and teachers, the use of digital media and applications in teaching, and the development of a collaborative and innovative school culture.

Semi-Structured Interview Guide

A semi-structured interview guide consisting of open-ended questions was developed based on the theoretical indicators of instructional leadership and digital learning innovation. These indicators included instructional vision and goals, academic supervision, instructional monitoring and evaluation, academic culture and teacher professional development, technology integration in teaching, teachers' pedagogical creativity and digital literacy, and adaptive learning based on students' needs.

The questions were adjusted according to the participants' roles as either principal or teacher, allowing information obtained from different participants to complement and corroborate one another. The interview guide ensured that the interviews remained aligned with the research objectives while allowing flexibility to explore emerging issues during the interviews.

Document Review Sheet

A document review sheet was used to systematically examine relevant school documents. This instrument enabled the researchers to assess the consistency between documented policies and actual practices in the field. The documents were reviewed with particular attention to technology integration in lesson planning, learning improvement programs, school policies concerning digitalization, and instructional supervision and evaluation records.

The integration of these three data collection techniques and supporting instruments enabled the

researchers to compare and corroborate information across different sources, thereby strengthening the credibility of the findings (Creswell, 2014).

Procedure and Research Ethics

To ensure the credibility and trustworthiness of the findings, the study employed triangulation and member checking.

Triangulation

Triangulation was used to enhance the credibility of the findings by comparing information obtained from different data sources and through different data collection techniques. Sugiyono (2019) describes triangulation as a technique that combines multiple methods and data sources to examine data credibility. Moleong (2017) similarly explains that triangulation involves using information outside the primary data as a means of checking or comparing findings. Creswell (2014) emphasizes that triangulation involves comparing different data sources, methods, or perspectives to strengthen the validity of qualitative findings.

Two forms of triangulation were applied in this study:

Source triangulation

Data obtained from the principal were compared with information provided by the two teachers. This process was intended to identify consistencies and discrepancies in participants' accounts of instructional leadership practices and teacher learning innovation.

Technique triangulation

Interview findings were compared with observation results and documentary evidence. For example, the principal's statements concerning the implementation of academic supervision were compared with academic supervision documents and the researchers' observations of related practices in the school.

Through these processes, triangulation was used to identify converging evidence and ensure that the findings were sufficiently credible and supported by multiple sources of evidence.

Member Checking

Member checking was conducted by returning relevant interview data and preliminary interpretations to the participants for confirmation. According to Sugiyono (2019), member checking aims to determine the extent to which the data obtained correspond to the information provided by participants. Creswell (2014) similarly notes that member checking involves returning descriptions or interpretations of findings to participants to obtain confirmation of their accuracy.

In this study, member checking was conducted through the following steps:

Interview transcripts were reviewed and confirmed with the respective participants.

The researchers' preliminary interpretations of participants' responses were presented to the participants to ensure that the intended meanings had been accurately understood.

Participants were given an opportunity to correct, clarify, or supplement the information before it was incorporated into the final findings.

The combination of triangulation and member checking was intended to enhance the credibility, consistency, and scientific rigor of the research findings.

Data Analysis

Data were analyzed qualitatively using the interactive data analysis model of Miles and Huberman (1994). The analysis consisted of four interconnected and iterative stages: data collection, data reduction, data display, and conclusion drawing/verification. These stages were conducted continuously throughout the research process rather than as strictly sequential procedures.

Results and Discussion

Results

Instructional Leadership

Leraning Vision

Findings from SDN 18 Deteng Deteng indicate that the school principal formulated a learning vision and mission oriented toward the integration of digital technology into teaching and learning. The vision was directed toward establishing an adaptive and creative learning environment consistent with the demands of educational digitalization, while the mission emphasized improving teacher quality through the development of digital lesson plans (RPP), the use of interactive media, and sustained professional development.

Interviews revealed that the formulation of the vision and mission was conducted participatively, involving teachers and education personnel in identifying policy directions that matched the school's needs. As the principal explained:

"In formulating the school's vision and mission, I always involve teachers and staff so that policy directions correspond to the school's needs. Our mission is to guide teachers in preparing digital lesson plans, encourage the use of interactive media, and ensure that academic supervision runs continuously." (TD)

Teacher informants confirmed that the principal consistently communicated the vision and mission through academic meetings, program socialization sessions, and supervisory activities, which helped teachers understand the school's policy direction and feel more motivated to innovate. This

was corroborated by a triangulating informant, who affirmed that teachers were genuinely involved in the formulation process rather than merely being informed of a predetermined decision. Supporting documentary evidence minutes of academic meetings, digital lesson-plan drafts, and supervision records confirmed teacher participation in this process.

The principal further translated the vision and mission into concrete innovation targets, requiring teachers to prepare digital lesson plans aligned with the curriculum, employ interactive media to explain abstract concepts, and utilize Canva as a creative tool for producing posters, infographics, and other visual materials. These targets were reiterated consistently in meetings and supervisory sessions, providing teachers with clear performance benchmarks. Data from teacher and triangulator interviews confirmed that these targets functioned not merely as formal directives but as genuine standards that fostered a culture of innovation, with physical evidence such as a displayed vision-and-mission board reinforcing their internalization into the school culture.

These findings collectively indicate that the participatory formulation, consistent communication, and concrete operationalization of the vision and mission constitute a coherent strategy through which the principal exercises instructional leadership managing curriculum direction, fostering teacher development, and establishing a clear policy orientation toward technology-based quality improvement.

Academic Supervision

Academic supervision at SDN 18 Deteng Deteng was conducted routinely once per semester through academic meetings, classroom visits, and direct mentoring. Supervision activities included classroom observation, review of digital lesson plans, and guidance on the use of interactive media and Canva. Both the principal and teacher informants emphasized that supervision was intended not merely as an evaluative mechanism but as a means of coaching and motivating teachers toward greater creativity and innovation.

Following each supervisory session, the principal provided constructive feedback focused on refining lesson plans to better address student needs, encouraging consistent use of interactive media, and promoting digital literacy development. This feedback was corroborated by the triangulating informant and documented in the minutes of academic meetings, which served as official records of the supervision process.

Beyond formal supervision, the principal also played an active role in supporting classroom instruction directly, entering classrooms to observe teaching practices and providing immediate,

practical suggestions regarding material delivery and classroom management. Teachers reported that this direct involvement made them feel supported rather than merely monitored, enhancing their confidence and motivation to improve instructional quality. Classroom observation notes compiled during each supervisory cycle served as documentary evidence of this ongoing mentoring process.

Regarding professional development, findings show that digital-learning workshops had been provided to teachers, both through internal mentoring within the school and through external training in collaboration with Universitas Sulawesi Barat (Unsulbar). However, informants consistently noted that such training was not conducted on a regular basis. While these sessions helped teachers become familiar with digital applications and interactive media, participants indicated a continued need for more frequent and sustained training to enable consistent, rather than occasional, integration of technology into instruction.

Monitoring and Evaluation

The principal's role extended beyond supervisory oversight to active coaching aimed at fostering teacher innovation. This coaching was delivered through academic supervision, direct mentoring, and follow-up feedback after classroom observation, directing teachers toward greater creativity, confidence, and consistency in using digital media such as videos, educational applications, and Canva. Findings from teacher and triangulator interviews confirmed that this coaching went beyond administrative oversight, reflecting a substantive dimension of instructional leadership oriented toward improving learning quality.

The principal also played a central role in sustaining teacher motivation through academic supervision, direct guidance, and moral encouragement, which made teachers feel valued and supported in experimenting with new instructional approaches. Beyond technical matters such as digital lesson plans and interactive media, the principal cultivated teachers' confidence and willingness to adapt to the demands of digital-era education. Data triangulation confirmed that this motivational support was delivered systematically rather than incidentally, evidenced by meeting minutes and supervision records documenting the principal's ongoing encouragement. Nonetheless, informants acknowledged that the full realization of this coaching depended on continued improvement in teachers' digital literacy through sustained training and mentoring.

Academic Culture

The principal was found to play a significant role in cultivating a conducive working climate characterized by open communication, moral

support, and collaboration between teachers and school leadership. This climate was built through academic meetings, developmental (rather than purely evaluative) supervision, and continuous motivation, resulting in teachers who reported feeling valued, comfortable, and more willing to innovate. Triangulated data including meeting minutes and supervision records documenting open communication and follow-up on teachers' ideas confirmed that this positive climate was cultivated systematically rather than incidentally, reinforcing the principal's role as an instructional leader who fosters a collaborative, quality-oriented working culture.

With respect to recognition, findings indicate that appreciation for creative teachers originated not only from the school principal but also from central and regional government policy. At the national level, the Ministry of Education provided recognition through the Outstanding Teacher program, certificates of achievement, and opportunities to participate in national-level training and instructional innovation competitions. At the regional level, teachers received certificates, incentives, and access to provincial or district-level training. The principal actively nominated creative teachers for such recognition, which informants and the triangulating source confirmed as a genuine and consistently applied practice supported by documentary evidence including certificates and training records rather than a merely symbolic gesture. This system of formal recognition reinforced teacher motivation and positioned the principal as an instructional leader who cultivates a culture of appreciation and innovation extending from the school to the district and national levels.

Learning Innovation in the Digital Era (Grand Theory)

Technology Integration

Findings indicate that teachers at SDN 18 Deteng Deteng predominantly relied on Canva and YouTube as their principal digital media, owing to their ease of use and suitability for presenting instructional content in an engaging and interactive manner. Canva was primarily used to design visual teaching aids such as posters and infographics, while YouTube served to present instructional videos, particularly for explaining abstract concepts in subjects such as Natural and Social Sciences (IPAS). Although both the principal and teacher informants, corroborated by the triangulating source, confirmed the consistent and effective use of these two platforms, they also acknowledged limited exploration of alternative digital applications. This pattern points to the need for further professional development and mentoring to diversify teachers'

digital media repertoire, a conclusion supported by documentary evidence including digital lesson plans and teacher-produced Canva materials.

Pedagogical Creativity

With regard to instructional models and methods, findings show that teachers commonly employed group discussion, question-and-answer sessions, brief lecture-based explanations, and project-based learning, selected according to the nature of the material, classroom conditions, and the principal's encouragement of instructional innovation. These methods were reported to enhance student engagement, encourage active participation, and strengthen conceptual understanding, with consistency confirmed through triangulated interviews and supported by supervision notes and lesson plans.

Beyond following the principal's directives, teachers also demonstrated independent initiative in developing their own instructional innovations, most notably through self-produced visual media using Canva and curated instructional videos from YouTube tailored to specific lessons. Interview data, corroborated by the triangulating informant and supported by documentation of teacher-created materials, indicate that such innovation stemmed from teachers' own creativity rather than solely from top-down direction, positioning teachers as active agents of innovation who support the principal's broader vision of instructional leadership responsive to the demands of the digital era.

Teachers' Digital Literacy

Despite teachers' enthusiasm for innovation, several constraints were identified in the implementation of digital-based learning. These included limited technological infrastructure the school possessed only two LCD projectors, requiring teachers to share equipment and rotate their use across classrooms unstable internet connectivity, which frequently disrupted the use of online resources such as YouTube, and uneven digital competency among teaching staff. Data from the principal, teachers, and the triangulating informant converged consistently on these three constraints, which were further substantiated by supervision records and classroom observation notes documenting recurring technical disruptions. These findings underscore the need for instructional leadership strategies that address infrastructural limitations through the provision of adequate facilities, continued digital-skills training, and sustained mentoring to enable more effective implementation of instructional innovation.

Adaptive Learning

Findings indicate a marked shift in teaching practices since the advent of digital-era education. Whereas instruction had previously relied

predominantly on traditional methods extended lecturing, board writing, and textbook-based delivery teachers reported transitioning toward more varied, interactive, and media-based approaches, incorporating Canva-designed visual materials and YouTube videos to enhance student engagement and comprehension. This shift was consistently reported across informants and corroborated by documentary evidence, including digital lesson plans, teacher-produced Canva materials, and supervision notes, reflecting teachers' evolving role as agents of innovation aligned with the principal's vision of adaptive instructional leadership.

Regarding future development, both the principal and teachers expressed clear expectations centered on improved technological infrastructure including additional LCD projectors, computers, and more stable internet connectivity alongside strengthened teacher professionalism through regular training in digital applications beyond Canva and YouTube. These aspirations, corroborated across all informants and supported by meeting records and supervision documentation outlining planned facility improvements and training programs, reflect a shared institutional commitment to advancing school quality and adaptability in response to the demands of digital-era education.

Supporting and Inhibiting Factors of the Principal's Instructional Leadership in the Era of Educational Digitalization at the Elementary School Level

Supporting Factors

The findings identify three principal factors supporting the effectiveness of instructional leadership at SDN 18 Deteng Deteng: the principal's sustained commitment to providing direction and motivation, teachers' strong intrinsic motivation to learn and innovate, and the availability of basic digital facilities such as laptops and projectors despite their limited quantity. Interviews with the principal, teachers, and the triangulating informant converged consistently on these three factors, indicating that they jointly cultivate a school climate conducive to technology-based instructional innovation, even amid resource constraints.

Inhibiting Factors

Conversely, the findings identify several factors constraining the effectiveness of the principal's instructional leadership, namely limited technological infrastructure, unstable internet access, uneven digital literacy among teachers, and time constraints arising from administrative responsibilities that frequently conflicted with the supervision schedule. The principal noted that competing administrative duties limited the consistency of supervisory coaching, while teachers

emphasized that the shortage of LCD projectors and unreliable internet connectivity directly hindered the use of digital media such as YouTube in the classroom. These constraints, corroborated by the triangulating informant, were found to jointly diminish the effectiveness of instructional leadership strategies aimed at promoting instructional innovation, underscoring the need for targeted interventions addressing both infrastructural and human-resource dimensions of digital-era teaching.

Discussion

Instructional Leadership (Grand Theory)

Planning the Instructional Vision and Mission

At SDN 18 Deteng-Deteng, the instructional vision and mission function as a practical framework guiding teachers toward technology-based learning, consistent with Hallinger and Murphy (1985), who identify curriculum management and instructional improvement as core dimensions of instructional leadership. This aligns with Hidayat (2024), who shows that clearly formulated visions strengthen teachers' commitment to technology-based instruction. Academic meeting minutes and supervision records confirm that the vision and mission are consistently communicated and translated into classroom practice, though uneven digital literacy among teachers remains a challenge.

Communicating the Vision and Mission to Teachers

Consistent communication of the vision and mission fosters shared understanding and encourages teachers to innovate, supporting Hidayat (2024) on the role of consistent communication in strengthening teacher commitment, and Sutrisno (2025) on the internalization of vision and mission through meetings and supervision as a driver of technology-based learning quality. This is evidenced by classroom observations, meeting minutes, and the school's displayed vision-mission board.

Establishing Specific Targets for Teacher Learning Innovation

Clear innovation targets give teachers direction and concrete standards, consistent with Rahman et al. (2023) on the role of instructional leadership in setting performance standards, and Pratama et al. (2024) on technology-oriented targets fostering creativity amid digital-era demands. Observations, meeting minutes, and supervision records confirm teachers consistently developed digital lesson plans, interactive media, and Canva-based materials in line with these targets.

Implementation of Academic Supervision

Academic supervision functions as a developmental rather than purely evaluative process, consistent with Prasrihamni et al. (2022) and Ampy et al. (2025) on supervision as a mechanism for teacher development and improved

technology-based learning quality. Meeting minutes and observation records confirm supervision is implemented consistently and systematically documented.

Principal Involvement in Classroom Instruction

Direct principal involvement in classrooms strengthens the principal's role as instructional mentor rather than evaluator, consistent with Saman and Hasanah (2024) on the value of direct involvement in building teacher confidence, and Prasrihamni et al. (2022) on supervision as a developmental process. Supervision records and revised lesson plans document this direct support.

Digital Learning Training and Workshops

Although not yet regular, digital training strengthens teachers' digital literacy and creativity, consistent with Afkar (2025) on continuous professional development, Purba (2026) on training as a key support for digital innovation, and Hermawan et al. (2026) on instructional leadership facilitating professional development through training. Meeting minutes and post-training lesson plans confirm implementation and impact.

Teacher Development to Promote Innovation

Teacher development strengthens professional competence rather than merely exercising control, consistent with Hermawan et al. (2026) on development as integral to instructional leadership, and Fullan (as cited in Pratama et al., 2024) on continuous support fostering adaptive, creative teachers. Meeting minutes and observation records confirm supervision is followed by constructive, developmental feedback.

Principal Motivation and Support for Teachers

Motivational support functions as a practical leadership strategy rather than mere encouragement, consistent with Ampy et al. (2025) on motivation within quality-oriented instructional leadership, and Fullan (as cited in Pratama et al., 2024) on moral support strengthening teacher commitment to innovation. This is evidenced in meeting minutes and supervision records.

Creating a Conducive School Working Environment

A conducive climate is itself a leadership strategy that builds teacher confidence and willingness to innovate, consistent with Rahman et al. (2023) on positive working climates within instructional leadership, and Fullan (as cited in Pratama et al., 2024) on collaboration and moral support as foundations of professional culture. Open communication and sustained support are documented in meeting and supervision records.

Recognition and Rewards for Creative Teachers

Formal recognition strengthens teacher motivation and professional growth, consistent with

Rahman et al. (2023) on the importance of recognizing teacher achievement, and Fullan (as cited in Pratama et al., 2024) on appreciation as a driver of innovation. Certificates, awards, and competition records confirm this practice is implemented, not merely symbolic.

Learning Innovation in the Digital Era (Grand Theory)

Digital Media Used in Learning

Digital media function as an innovation strategy rather than a supplementary tool, consistent with Annur et al. (2026) on Canva enhancing learning interest and achievement through visualization of abstract concepts, and Widiono et al. (2026) on YouTube enhancing digital literacy, motivation, engagement, and character values. Observations, lesson plans, and supervision records confirm daily integration of both media.

Frequently Used Learning Models and Methods

Teachers combine discussion, question-and-answer, brief lectures, and project-based learning to encourage active participation, consistent with Suryani (2025) on discussion methods improving communication and conceptual understanding, and Pratama et al. (2024) on project-based learning fostering creativity and collaboration relevant to the digital era. Supervision records and lesson plans confirm consistent use of these methods.

Teachers' Independent Development of Learning Innovations

Teachers show creativity in developing innovations independently, beyond Canva and YouTube use, consistent with Annur et al. (2026) and Widiono et al. (2026) on these platforms enhancing learning interest, digital literacy, and engagement. Lesson plans, Canva materials, and video records confirm teacher-initiated innovation.

Challenges in Implementing Learning Innovation

Limited facilities, unstable internet, and uneven digital competence constrain optimal implementation, consistent with Susanto et al. (2020) on technology adoption as an innovation-diffusion process requiring leadership support, and Purba (2026) on infrastructure and digital literacy as major barriers. Observations and supervision records confirm recurring connectivity issues and shared, limited LCD projectors.

Changes in Teaching Practices in the Digital Era

Teaching has shifted from traditional toward technology-supported approaches, with teachers increasingly acting as facilitators, consistent with Annur et al. (2026) and Widiono et al. (2026) on Canva and YouTube's role in enhancing engagement

and digital literacy. Observations and supervision records confirm this gradual shift.

Expectations for Future School Development

Expectations center on improved infrastructure, continued teacher training, and sustained innovation, consistent with Susanto et al. (2020) on leadership-driven technology diffusion, and Annur et al. (2026) on digital media's potential to enhance learning outcomes. Observations and school meeting records confirm ongoing facility and training constraints and plans.

Supporting and Inhibiting Factors

Supporting Factors

Principal commitment, teacher motivation, and available (if limited) digital facilities are the main supporting factors, consistent with Annur et al. (2026) and Widiono et al. (2026) on Canva's and YouTube's contribution to learning interest, digital literacy, and engagement. Observations and supervision records confirm the principal's consistent encouragement of digital media use and innovation.

Inhibiting Factors

Limited facilities, uneven digital literacy, and unstable internet connectivity constrain optimal implementation of instructional leadership, consistent with Prasrihamni et al. (2022) on facility and technological-readiness challenges in digital-era instructional leadership. Some teachers remain limited to single applications (e.g., Canva), while insufficient LCD projectors and connectivity issues further reduce implementation effectiveness.

Conclusion

The principal's instructional leadership strategy was implemented through instructional planning, academic supervision, teacher professional development, and the utilization of digital technology. The principal functioned actively as a facilitator, motivator, and director in fostering a learning environment adaptive to the demands of the digital era. Teachers' learning innovation was reflected in the use of digital media such as Canva, YouTube, and interactive learning applications, which shifted instructional practices from traditional methods toward more creative, interactive, and technology-based approaches. Supporting factors included the principal's commitment, teachers' motivation, and the availability of digital facilities that, despite being limited, were utilized optimally. Inhibiting factors included limited technological infrastructure (e.g., a shortage of LCD projectors), uneven teacher digital literacy, unstable internet

access, and the principal's limited time due to administrative responsibilities.

Overall, the principal's instructional leadership played a significant role in fostering teachers' learning innovation. Through sustained coaching, academic supervision, professional development, and the utilization of digital technology, instructional quality was enhanced, becoming more effective, creative, and responsive to the demands of digital-era education.

Teachers are encouraged to continuously develop their digital competence through training and self-directed learning; principals are advised to intensify academic supervision and mentoring while advocating for additional technological facilities; schools are recommended to conduct periodic evaluation of digital-based instructional programs alongside adequate infrastructural provision; education stakeholders, including district education offices and policymakers, are urged to give greater attention to teacher capacity development and digital facility provision in primary schools to ensure equitable digital transformation; and future researchers may use this study as a reference for further investigation into instructional leadership and the effectiveness of educational digitalization policies across varied primary school contexts.

Theoretically, this study reinforces the relevance of Hallinger's, Fullan's, and Rogers's perspectives on instructional leadership as a strategic approach to improving digital-based instructional quality in primary education; practically, it demonstrates that the success of instructional digitalization depends substantially on principals' commitment and teachers' readiness, offering a reference for designing professional development programs and facility provision; and in terms of policy, it underscores the need for district-level support through sustained training, digital infrastructure provision, and supervision policies more adaptive to the demands of educational digitalization.

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Conflict of Interest

The authors declare no conflict of interest.

Author Contributions (Optional)

[State each author's contribution consistently, e.g., conceptualization; methodology; investigation; data

curation; formal analysis; writing-original draft; writing-review and editing; supervision.]

Generative AI Disclosure

The authors declare that no generative AI tools were used in the preparation of this manuscript.

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AUTHOR QUALITY CHECK

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Quality Element	Maximum Weight	Self-check before submission
F.1 Title	2	Concise, specific, informative, and aligned with the article content; where possible, signals the central finding/focus. Include the research location only when analytically relevant. For an English-language article, use the English title consistently.
F.2 Abstract	3	Clear and compact; contains objective, method, key results, and conclusion/implication in one paragraph.
F.3 Keywords	1	Keywords represent the article's central concepts and improve discoverability/searchability.
F.4 Scientific novelty, originality, gap	7	Introduction demonstrates an adequate state of the art, a clear research gap/justification, explicit novelty or contribution, and a clearly stated objective. Original research is prioritized; reviews should offer substantive original analysis/synthesis.
F.5 Analysis and synthesis	8	Methods are adequate; important findings are supported by clear evidence; interpretation is deep and accurate; findings are compared critically with relevant and current theory/research.
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G.3 Systematic structure	2	Article sections are complete, systematic, and consistent with the journal author guidelines and the chosen article type.
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G.5 References	3	Citation style is standardized and consistent; in-text citations and references match 100%; references must be valid and verifiable; reference format follows APA 7.
G.6 Academic language	4	Uses standard terminology, clear and correct academic English, discipline-appropriate wording, and consistent language/editing throughout.

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