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The Role of the Principal as a Supervisor in Improving Digital-Based Educational Quality at SMKN 2 Marabahan

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ABSTRACT

This qualitative descriptive study examines the principal's supervisory role in improving digital-based educational quality at SMKN 2 Marabahan during the Industrial Revolution 4.0 era. Data were collected through semi-structured interviews with the principal, 15 teachers, and three staff members, supplemented by 20 classroom observations and documentation analysis. Analysis followed Miles and Huberman's interactive model with triangulation and member checking for validity. Findings reveal that the principal functions as an innovative supervisor through three strategies: implementing a Learning Management System for systematic monitoring, developing industry-aligned programs (industrial classes and Vocational Industrial Work Training), and facilitating continuous teacher professional development with a developmental rather than evaluative approach. Results showed the school's national accreditation score increased from 83.5 to 91.5 (9.6% improvement), digital competency test pass rates rose from 78% to 92%, and graduate employment rates increased from 65% to 81%. These findings demonstrate that technology-adaptive supervision significantly enhances vocational education quality, suggesting that principals must integrate digital technologies and industry partnerships for effective vocational education transformation in the digital era.

1. Introduction

Digital technology has transformed education, making innovative learning media essential to meet 21st-century demands. Traditional methods relying on textbooks and lectures often fail to actively engage students. Augmented Reality (AR) has emerged as a promising technology that merges virtual objects with real-world environments, enabling direct interaction with learning content (Septiani et al., 2025). Furthermore, AR-based educational innovations have proven effective in visualizing abstract concepts and improving learning outcomes across various educational levels (Syahrir et al., 2025).

The Industrial Revolution 4.0 has fundamentally transformed economic, social, and educational landscapes through automation and digital innovation. The integration of artificial intelligence, robotics, and the Internet of Things has created significant opportunities for individuals who can access and develop technology to generate innovative solutions across various sectors, including education (Sudarsana et al., 2020). These developments have made digital competencies increasingly critical for both educators and students in vocational education settings (Wulandari et al., 2021).

In response to these transformations, educational institutions have increasingly adopted digital learning management systems and technology-enhanced pedagogical approaches to improve educational quality and graduate competitiveness. School principals play a critical role in leading digital transformation through strategic supervision and professional development initiatives that strengthen teachers' digital competencies (Darmawati et al., 2025). Research demonstrates that effective principal supervision significantly enhances teachers' pedagogical competence and instructional quality (Hikmah et al., 2025).

Specifically, within vocational education contexts, principals' supervisory roles have proven essential in enhancing teaching quality and learning outcomes through systematic monitoring and professional development. Studies reveal that principals' innovative strategies in implementing quality improvement initiatives have measurable impacts on school performance and student outcomes (Natasya & Maksum, 2025). Furthermore, principals who integrate digital technology into supervisory practices create more efficient monitoring systems and provide timely feedback that enhances instructional quality (Trihandayani et al., 2025).

Recent research in Indonesian contexts has illuminated the critical relationship between principal supervision and educational quality in the digital era. Rini and Lestari (2025) found that principals' leadership strategies in strengthening digital competencies significantly enhance teacher professionalism in junior high schools. Ridiyawati et al. (2025) demonstrated that principals' supervisory roles effectively improve learning quality through systematic approaches. Moreover, the integration of digital platforms in supervision has shown promising results in enhancing both teaching effectiveness and student learning outcomes (Nikmah et al., 2025). This study addresses identified research gaps by examining: (1) How the principal at SMKN 2 Marabahan conceptualizes and implements supervisory roles in digital-based vocational education; (2) What strategies the principal employs to integrate digital technology into educational quality improvement and what challenges arise; (3) What educational outcomes result from digital-based supervisory practices and how these are measured and verified.

Through in-depth qualitative investigation, this study makes three key contributions. First, it provides empirical evidence on how principals in resource-constrained vocational contexts leverage digital technology to enhance supervisory effectiveness. Second, it extends supervision theory by demonstrating how developmental, collaborative supervisory philosophies can be operationalized through technology-mediated practices. Third, it offers policy-relevant findings on

conditions, capacities, and supports necessary for effective digital transformation in vocational education.

2. Methodology

This study employed a qualitative descriptive research design (Busetto et al., 2020) to provide comprehensive understanding of the principal's supervisory role in improving digital-based educational quality at SMKN 2 Marabahan during the Industrial Revolution 4.0 era. This approach allows in-depth exploration of complex social phenomena in natural settings, enabling rich description of participants' experiences regarding digital-based supervision practices (Cypress, 2021), and is particularly appropriate for examining 'how' and 'why' questions related to organizational processes and leadership practices (Karagiozis, 2020). The research was conducted at SMKN 2 Marabahan, a public vocational high school in Barito Kuala Regency, South Kalimantan Province, Indonesia, from March to July 2024, serving approximately 540 students across three vocational programs: Computer Network Engineering, Accounting and Financial Institutions, and Office Administration. This site was purposively selected as it represents a typical regional vocational school that has demonstrated measurable quality improvements under the current principal's leadership since 2022, making it an information-rich case for examining digital-based supervisory practices.

Participants were selected through purposive sampling (Campbell et al., 2020), consisting of 19 informants: one school principal (male, 48 years old, 22 years teaching experience, 3 years as principal); 15 teachers (8 female, 7 male, ages 28-54, teaching experience 4-28 years) representing all three vocational programs and various subject areas to ensure representation of variations in experience, digital competency, and subject areas; and three educational staff members including curriculum coordinator (female, 15 years-experience), student affairs coordinator (male, 10 years-experience), and IT administrator (male, 5 years-experience). Written informed consent was obtained from all participants prior to data collection, and pseudonyms were used throughout to protect confidentiality and maintain ethical research standards.

Instrument

The primary research instrument in this qualitative study was the researcher, supported by three structured data collection tools designed to ensure systematic and comprehensive data gathering (DeJonckheere & Vaughn, 2020). First, a semi-structured interview protocol was developed containing open-ended questions organized into five thematic domains: the principal's supervisory philosophy in the digital era (8 questions), digital technology integration strategies (12 questions), teacher professional development initiatives (10 questions), monitoring and evaluation systems (9 questions), and implementation challenges and outcomes (11 questions). The interview protocol was pilot-tested with two teachers from a similar vocational school, resulting in minor revisions to question wording and sequencing. Second, a structured observation protocol was created to guide classroom

observations, containing pre-defined categories for recording types and frequency of digital tools used, teacher-student interaction patterns, pedagogical approaches, student engagement levels, and classroom management techniques, including both structured sections with rating scales (1-5) and open-ended sections for descriptive field notes. Third, a document analysis checklist was developed to systematically identify and categorize relevant documents including strategic plans, supervisory reports, professional development records, LMS analytics, accreditation reports, student achievement data, and industry partnership agreements, with criteria for assessing document authenticity, credibility, and relevance. All three instruments were reviewed by two experienced qualitative researchers with expertise in educational leadership to ensure content validity and methodological rigor before implementation.

To enhance researcher competence as the primary instrument, several preparatory measures were undertaken. The researcher engaged in reflexive journaling throughout the research process to identify personal assumptions and biases that might influence data collection and interpretation (Probst & Berenson, 2024). Prior to fieldwork, the researcher reviewed recent literature on educational supervision, digital leadership, and qualitative research methodology to strengthen theoretical sensitivity and analytical capability. Additionally, the researcher participated in a two-day workshop on qualitative interviewing techniques, focusing on developing rapport with participants, asking probing follow-up questions, managing power dynamics, and conducting culturally sensitive interviews in Indonesian educational contexts. These preparation activities enhanced the researcher's ability to serve as an effective, reflexive, and ethically responsible research instrument throughout the study.

Data Collection

Data were collected through three complementary methods over five months (March-July 2024) to enable methodological triangulation (Abdalla et al., 2018; Renz et al., 2018). Semi-structured interviews were conducted with all 19 participants between March and May 2024, each lasting 45-90 minutes (average 68 minutes), totaling 21.5 hours of recorded data. Interviews were conducted in Indonesian at convenient locations, audio-recorded with dual digital recorders, transcribed verbatim by a professional transcriptionist within 48 hours, and returned to participants for member checking, with fourteen participants confirming accuracy. Classroom observations were conducted during April and May 2024, totaling 20 teaching sessions (2-3 sessions per teacher) across different subjects, grade levels, and times, with each session lasting 90 minutes. Using a non-participant approach, observations documented digital tools usage, interaction patterns, instructional strategies, and engagement indicators through real-time field notes expanded into full narratives within 24 hours, averaging 4-5 pages per session (Kawulich, 2020). Document analysis was conducted throughout March-July 2024, intensively reviewed in June-July, examining school strategic plans (2022-2024), principal's supervisory documents, professional development records, LMS usage reports, accreditation reports (2022 and 2024), student achievement data, graduate tracer studies, and PRAKERIN evaluation reports. Documents were systematically

reviewed using an analysis checklist assessing authenticity, credibility, and meaning, with extracted information coded and integrated to triangulate findings from interviews and observations (Dalglish et al., 2020).

Data Analysis

Data analysis followed Miles, Huberman, and Saldaña's (2020) interactive model of qualitative analysis, encompassing three concurrent flows: data condensation, data display, and conclusion drawing and verification. Data condensation transformed approximately 380 pages of interview transcripts, 85 pages of field notes, and documents through two coding cycles using MAXQDA 2024 software. First-cycle coding employed both deductive approaches from theoretical frameworks including Glickman, Gordon, and Ross-Gordon's (2020) developmental supervision theory, digital leadership frameworks from Sheninger and Murray (2020) and Fullan (2020), alongside inductive open coding, generating 127 discrete codes. Second-cycle coding condensed these into 18 analytical categories including supervisory philosophy, digital technology adoption, LMS implementation, and professional development designs (Saldaña, 2021). Data display organized findings through thematic matrices, temporal matrices across three periods (2022, 2022-2023, 2023-2024), network diagrams, and conceptually clustered matrices, revealing five main themes: developmental supervisory philosophy, strategic digital integration, systematic capacity building, collaborative culture cultivation, and measurable quality improvements. Conclusion drawing and verification employed pattern matching, rival explanation testing, and negative case analysis following Miles et al. (2020) and trustworthiness criteria (Korstjens & Moser, 2022). Peer debriefing occurred in three sessions (April, June, July 2024) with experienced qualitative researchers, and member checking was conducted with three key informants in July 2024. Throughout the process, approximately 60 analytical memos documented interpretive insights, methodological decisions, and researcher positionality, providing an audit trail ensuring transparency and credibility (Watkins, 2020).

3. Results and Discussion

Identification of the Principal's Strategies Implemented at SMKN 2 Marabahan

Teacher Qualifications and Supporting Facilities

SMKN 2 Marabahan has teaching staff with appropriate qualifications, with 62% of teachers already holding professional certification. Essential facilities such as automotive workshops, computer laboratories, and visual communication design (DKV) studios are available and in usable condition. These data are supported by the school's profile documents and four weeks of direct observation in the field. In interviews, the principal stated: "We already have competent teachers, but the challenge is how to continuously develop their competencies so they do not fall behind industry developments."

Curriculum Alignment Strategy with Industry Needs

SMKN 2 Marabahan has implemented an industrial class program in Automotive Engineering (TKR) and Visual Communication Design (DKV) competencies. This program involves industry partners in syllabus development, module provision, and practical work supervision. Observation results show that Grade XII TKR students regularly conduct practical work at partner workshops for 2–3 days per week. In interviews, an industry instructor stated: “Students from SMKN 2 Marabahan are already quite prepared, but they still need a lot of retraining regarding SOPs and work safety.”

Digital Management Innovation through an Integrated LMS

The school has implemented a Learning Management System (LMS) used for delivering learning materials (modules, videos, assignments), collecting and assessing assignments online, and facilitating teacher–student discussion forums. Observation results indicate that 78% of teachers actively use the LMS, especially for theoretical subjects. However, LMS use for practical learning remains limited due to the lack of simulation features and direct monitoring tools. In interviews, a productive subject teacher stated: “The LMS is good for theory, but for practical work we still need face-to-face sessions. We need features that can record students’ practical work processes.”

Graduate Quality Improvement through Competency Certification

The school facilitates competency certification for students, such as LSP P1 certification for TKR and Adobe certification for DKV. School data show that in the 2024/2025 academic year, 75% of Grade XII students obtained at least one competency certificate. In interviews, a Grade XII TKR student stated: “I feel more confident when applying for jobs because I already have a certificate. Companies also trust me more.”

Impact of Strategies on Graduate Quality

Evaluation results of educational quality show an 8% increase in the school’s education report card score compared to the previous period. School data also show:

- Graduation rate: 96%
- Graduates directly employed: 68%
- Graduates continuing to higher education: 22%

Critical Discussion: Findings vs. Theory and Previous Studies

Curriculum Alignment and Industry Linkages

The findings on the implementation of industrial classes at SMKN 2 Marabahan are consistent with studies by Rahayu et al. (2021) and Wibowo et al. (2022), which emphasize the importance of school–industry partnerships in aligning graduate competencies with labor market needs. However, unlike the study by Sudjimat et

al. (2020), which shows intensive industry involvement, at SMKN 2 Marabahan, partnerships are still project-based and do not yet involve industry in periodic curriculum evaluation. These findings also confirm the critique by Mutohhari et al. (2021) that SMK graduates still lack soft skills such as communication and teamwork. Observations show that students already possess sufficient technical skills, but they still require special training in presentation, negotiation, and team collaboration in work environments. This indicates that while technical alignment is progressing, the development of employability skills remains a critical gap that must be addressed through more structured programs (Sudiyatno et al., 2020).

Digital Management and LMS Implementation

The implementation of the LMS at SMKN 2 Marabahan supports the findings of Saputra et al. (2021) and Surahman et al. (2022), which show that LMS can increase student learning motivation and engagement. However, unlike general secondary schools, in vocational schools the LMS is more effective for theoretical components than for practical learning, as emphasized by Rafiola et al. (2020) and Hidayat et al. (2023). The main limitations are that the LMS does not yet fully support project-based learning and field practice, and teachers still need more training in designing online activities relevant to vocational competencies (Handayani & Muliastri, 2020). This suggests that while digital platforms enhance access and flexibility, they cannot fully replace hands-on practice; instead, they should be integrated as a complementary tool within a blended learning model that maintains the core of vocational education.

Competency Certification and Graduate Quality

The finding that competency certification increases students' self-confidence and employment opportunities aligns with the concept of Graduate Competency Standards (SKL) and the research of Setiawan et al. (2021) on the importance of industry-recognized validation of skills. However, unlike SMKs in Java that have fully integrated certification into their curriculum, at SMKN 2 Marabahan certification is still an additional activity and not yet fully embedded in daily teaching and learning processes. This partial integration limits the impact of certification on overall learning quality, as students may treat certification as a separate event rather than as an integral part of their learning journey (Arifin et al., 2020). To strengthen this, schools should gradually shift toward a curriculum model where certification standards are explicitly mapped to learning objectives, assessment, and teaching activities, ensuring that certification becomes a natural outcome of the educational process rather than an add-on.

Graduate Quality and National Education Standards

The 8% increase in the school's education report card score indicates that the principal's strategies have positively impacted the quality of educational services, in line with the framework of the National Education Standards (SNP), which emphasize the balance between input, process, output, and outcome (Zaini & Hakim, 2022). However, these findings also confirm the critique by Rahmawati et

al. (2020) that the quality of facilities, teaching processes, and educator competencies remain major challenges that require continuous improvement. While the current strategies have improved measurable outcomes such as graduation rates and employment, the underlying quality of teaching and learning processes still needs strengthening. For example, the use of student-centered approaches, formative assessment, and reflective practice among teachers remains inconsistent (Ningsih et al., 2021). Therefore, future quality improvement efforts should not only focus on external indicators but also on deepening pedagogical quality and professional learning communities within the school. The following are the planning strategies formulated by the principal and the management team to improve educational quality and the school's market competitiveness:

Curriculum Synchronization with Industry

In the context of improving digital-based educational quality, the principal at SMKN 2 Marabahan implemented systematic supervision activities that emphasized professional dialogue and reflective evaluation of teaching practices. These activities were conducted through structured meetings involving teachers and school management, where instructional planning, the use of digital learning media, and classroom implementation strategies were critically discussed (Tobari et al., 2020). The supervision process aimed to strengthen teachers' pedagogical competencies and digital literacy by providing constructive feedback rather than evaluative control. Through this approach, teachers were encouraged to actively present their instructional designs and reflect on their instructional decisions. The principal acted as a facilitator who guided discussions, clarified expectations, and aligned teaching practices with school quality standards and Industry 4.0 demands (Darmawati et al., 2025). This supervision model also promoted transparency and collaboration among teachers by allowing peer learning and shared reflection. As a result, supervision became a continuous professional learning process rather than a one-time assessment activity. Figure 1 illustrates the implementation of this digital-based supervision activity during a teacher presentation session at SMKN 2 Marabahan.



Figure 1. Socialization of the Industrial Class Program

The rapid development of the world of work necessitates periodic curriculum reviews to ensure material delivered in schools remains relevant to current labor market needs, with relevance between education and industrial needs being a key factor in achieving vocational education objectives (Arifin et al., 2020; Sudjimat et al., 2020). Vocational High Schools (SMK) aim to equip students with skills enabling them to enter the workforce in specific fields, as mandated by National Education System Law Number 20 of 2003, Article 15, with success largely determined by close partnerships between schools and industry ensuring graduate competencies align with market needs (Tobari et al., 2020; Wibowo et al., 2022). This has given rise to the industrial class model, which provides benefits for both parties (Rahayu et al., 2021), where students gain real work experience, practice skills according to their fields (Mutohhari et al., 2021), and directly apply learning materials in real work situations, strengthening their technical skills (Saputra et al., 2021; Setiawan et al., 2021). This model is designed to meet curriculum demands, provide authentic work practice, and foster students' experience and responsibility (Ningsih et al., 2021), representing a response to contemporary educational challenges of producing graduates balanced in academic, technical, and employability skills (Handayani & Muliastri, 2020), with SMKN 2 Marabahan implementing this program across various fields such as automotive engineering and visual communication design to provide contextual learning experiences aligned with the world of work.

Digital-Based Management Innovation through the Use of an Integrated LMS

In response to the growing demands of digital transformation in vocational education, SMKN 2 Marabahan has implemented an integrated Learning Management System (LMS) as part of its digital-based management innovation. The LMS serves as a central platform for organizing learning materials, managing instructional activities, and supporting supervision and monitoring processes. This system enables teachers to systematically upload learning resources, design online assignments, and monitor student participation in both theoretical and practical learning components. For school management, the LMS functions as a tool to enhance transparency, accountability, and data-driven decision-making in instructional supervision (Nikmah et al., 2025). Through LMS utilization, the principal can observe teaching implementation patterns, identify instructional challenges, and provide timely feedback to teachers (Hikmah et al., 2025). The integration of LMS also supports blended learning approaches that combine face-to-face practice with online learning activities (Rafiola et al., 2020). Figure 2 presents the interface of the Learning Management System used at SMKN 2 Marabahan to support digital-based learning and management processes.

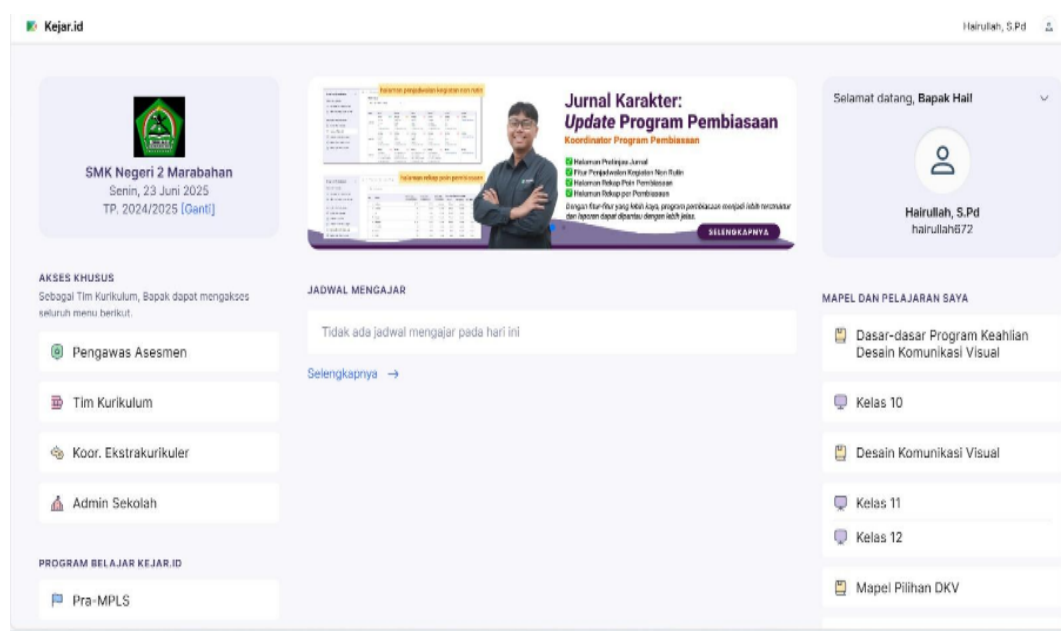


Figure 2. Learning Management System (LMS) Interface

The LMS implementation at SMKN 2 Marabahan examines its impact on vocational learning, which emphasizes practical skill acquisition alongside theoretical understanding. The LMS broadens access to materials, strengthens teacher-student interaction, and streamlines assignment management (Surahman et al., 2022). Findings indicate LMS facilitates organized learning and improves communication, but vocational effectiveness depends on integrating digital learning with hands-on practice (Hidayat et al., 2023), highlighting pedagogical integration requirements. LMS flexibility, such as asynchronous access, aligns with findings that blended learning enhances motivation and outcomes (Rafiola et al., 2020), though vocational students benefit most with clear guidance and structured pathways to avoid prioritizing theory over practical skills. Regarding delivery, LMS enables diverse multimedia formats, and multimedia content increases attention and satisfaction when relevant to workplace practices (Septiani et al., 2025), with students responding more positively to content simulating industrial processes.

LMS-supported learning fosters learner autonomy through independent exploration (Sudarsana et al., 2020), though some students experienced self-regulation difficulties when practical tasks required close supervision, indicating that LMS autonomy should be balanced with continuous teacher monitoring. Overall, findings confirm general LMS benefits while demonstrating that vocational effectiveness depends on pedagogical alignment, content authenticity, and structured supervision (Surahman et al., 2022), refining theoretical understandings for vocational education contexts.

Alignment of Strategies with the School Education Plan

Strategy represents a comprehensive pattern encompassing goals, policies, programs, actions, decisions, and resource allocation reflecting an organization's

identity and rationale (Fullan, 2020). Strategy formulation commonly employs SWOT analysis comparing internal factors (strengths and weaknesses) and external factors (opportunities and threats). SMKN 2 Marabahan implemented this through strategic review based on field conditions and stakeholder aspirations, followed by issue analysis for problem-solving strategies. Effective strategies meet three criteria: technical feasibility, political acceptability among stakeholders, and alignment with ethical, moral, and legal norms.

The strategies implemented by SMKN 2 Marabahan have been appropriately targeted, reflected in an 8% increase in the education report card compared to the previous period, indicating positive outcomes from the principal and management team's strategies (Intan et al., 2025). Nevertheless, continuous improvement in teacher performance must remain a priority to ensure sustained educational quality enhancement (Kurniawan et al., 2022). To ensure sustainability, the principal and management team formulated comprehensive planning strategies based on internal and external analysis, aligning the school's vision, mission, and operational programs with vocational education and Industry 4.0 demands (Hussin, 2020). Strategic planning involved curriculum synchronization with industry needs, strengthening digital-based management systems, enhancing teacher professional development, and optimizing learning facilities and resources (Natasya & Maksum, 2025). Each strategy was translated into measurable programs and performance indicators for systematic monitoring and evaluation. Through this structured process, the school coordinated resources effectively and prioritized high-impact programs. The planning strategies also encouraged stakeholder collaboration, including teachers, industry partners, and school management, making educational improvement initiatives more focused, coherent, and goal-oriented (Yenita & Andriani, 2025). Figure 3 illustrates the educational planning strategy outcomes implemented at SMKN 2 Marabahan.

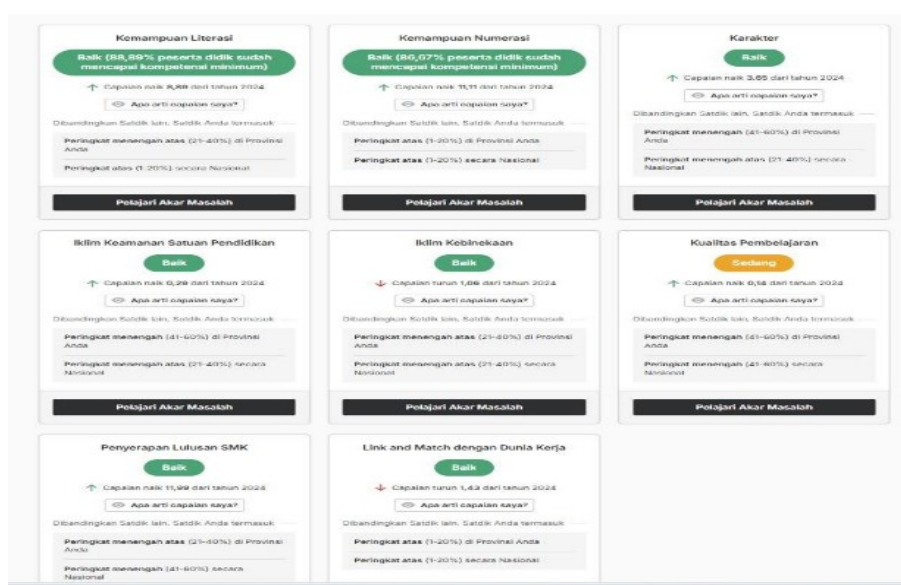


Figure 3. Outcomes of Educational Planning Strategies

Impact of Strategy Implementation on Graduate Quality

In the face of global competition, high-quality human resources depend on effectively managed education systems, requiring school principals to possess comprehensive strategies prioritizing quality improvement and graduate competitiveness (Sheninger & Murray, 2020). For Vocational High Schools (SMKs), educational quality is measured through compliance with eight National Education Standards (SNP) as regulated in Government Regulation No. 19 of 2005, documented in the Education Quality Report. At SMKN 2 Marabahan, quality improvement strategies enhance graduate readiness through four integrated approaches: (1) aligning curriculum with industry demands, (2) engaging industry practitioners as guest teachers, (3) ensuring full student participation in PRAKERIN, and (4) developing project-based learning simulating workplace challenges (Rahmawati et al., 2020). These strategies strengthen technical competencies and soft skills, with effectiveness evident in an 8% increase in the Education Quality Report score. Industrial internship programs have become critical in producing work-ready graduates by providing direct exposure to professional environments, enabling application of theoretical knowledge and development of industry-aligned work ethics (Rahayu et al., 2021; Wibowo et al., 2022). The principal's strategic leadership ensures systematic implementation (Glickman et al., 2020), reflecting the assertion that high-quality institutions demonstrate achievements consistently exceeding established standards.

Empirical findings show clear improvement through increased quality scores, high graduation rates, and growing graduate acceptance into higher education or employment, demonstrating measurable, sustainable impacts. As emphasized by recent studies (Masyhud & Tasnim, 2020; Zaini & Hakim, 2022), educational quality must be evaluated holistically across input, process, output, and outcome dimensions, confirming that SMKN 2 Marabahan's strategic initiatives align effectively with established quality frameworks while highlighting the necessity of ongoing refinement to maintain graduate competitiveness.

4. Conclusion

The findings of this study indicate that the principal's role as a supervisor at SMKN 2 Marabahan significantly influences the improvement of education quality in the digital era. The principal's supervision is not limited to routine evaluation, but is transformed into a strategic, educational, and participatory process that actively integrates digital innovation into school management and teaching practices. By aligning supervisory functions with technological tools such as the Learning Management System (LMS), industry-class programs, and digital-based teacher professional development the principal creates a coherent ecosystem where supervision directly supports curriculum relevance, pedagogical innovation, and graduate employability. This study contributes to school leadership practice by showing that effective digital-era supervision requires the principal to act as a change agent who synchronizes three key elements: pedagogical guidance, technological integration, and industry alignment. In this role, supervision becomes

a catalyst for continuous improvement, not only in teaching quality and student outcomes, but also in the school's adaptability to the demands of the Industrial Revolution 4.0. Thus, the principal's most important contribution lies in redefining supervision as a dynamic, forward-looking process that builds a sustainable, digitally responsive educational environment.

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