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Scientific Supervision in Improving Teacher Professionalism Competence

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ABSTRACT

Conventional supervision in Indonesia is often trapped in administrative formalities and subjective evaluation, failing to address the dynamic challenges of the Merdeka Curriculum and digital integration. This study aims to fill the research gap by synthesizing a scientific supervision framework that bridges the disconnect between administrative compliance and genuine professional growth. Using a library research method with a qualitative descriptive approach, this article critically analyzes theoretical and empirical literature published between 2015-2024. The specific novelty of this study lies in the conceptual integration of the clinical supervision model with digital-based observation instruments to ensure objectivity. The analysis indicates that scientific supervision significantly improves teacher competence when implemented through a cyclic process of structured observation and objective feedback. This study contributes a strategic roadmap for school leaders to transform supervision into a collaborative culture.

Kywords: scientific supervision, teacher competence, professionalism, human resource development

INTRODUCTION

The quality of education is inextricably linked to teacher professionalism. However, empirical conditions in Indonesia reveal a discrepancy: while curriculum demands have evolved towards student-centered learning and digital integration, supervisory practices remain largely administrative. This creates a "competence gap" where teachers receive little substantive feedback. Supervision is frequently viewed as a threat rather than a support system. Therefore, a paradigm shift towards scientific supervision characterized by objectivity and collaboration is urgent. This article critically examines how scientific supervision serves as a transformative instrument to enhance teacher professionalism in the digital age.

Indonesian education currently faces complex challenges that necessitate a transformation in the approach to teacher development. Dynamic curriculum changes, ranging from the Education Unit Level Curriculum (KTSP), the 2013 Curriculum, to the Merdeka Curriculum, demand high adaptability from educators. In addition, the digital revolution in learning and global quality standards further reinforce the urgency of continuously improving teacher competence.[1] Under such circumstances, supervision can no longer be viewed as a mere inspection activity, but must be transformed into a collaborative process oriented towards substantive improvement in the quality of learning.

[1] Mulyasa, E. (2021). *Menjadi Guru Profesional: Menciptakan Pembelajaran Kreatif dan Menyenangkan*. Bandung: PT Remaja Rosdakarya.

Emphasizing that academic supervision is urgent as a foundation for teacher professionalism.[2] A systematic and data-driven approach to supervision is urgently needed to address the increasingly complex challenges of 21st-century education. Supervision is no longer viewed as a purely inspection-based activity, but rather as a collaborative process aimed at improving the quality of learning.

The phenomenon of low teacher competence in various educational institutions demands innovation in the supervisory approach. Empirical data shows that there are still many teachers who are not yet optimal in carrying out their professional duties, both in terms of learning planning, learning implementation, and student learning outcome evaluation.[3] Conventional supervision, which is subjective and unstructured, has proven to be ineffective in comprehensively identifying and addressing learning problems. Therefore, scientific supervision has become an alternative solution that offers a more objective, systematic, and empirically-based approach.

Educational supervision in many institutions still faces various structural and cultural barriers that hinder its effectiveness. Supervision tends to be carried out in a formal and administrative manner, rather than as a deep and transformative coaching process. Many teachers consider supervision to be merely an inspection activity, which causes psychological resistance and discomfort in the learning process.[4] This phenomenon creates a situation where supervision loses its essence as an instrument of professional development.

In addition, conventional supervision practices are often not based on objective data, but rather rely solely on the subjective perceptions of supervisors, which may contain personal biases. This phenomenon results in ineffective teacher development, so that pedagogical, professional, social, and personal competencies do not develop optimally.[5] As a result, the quality of learning in the classroom stagnates and does not experience the significant improvement that is expected.

Another problem faced is the limited competence of supervisors in carrying out quality supervision. Many supervisors do not yet have the skills to conduct systematic observation, analyze learning data, and provide constructive feedback that can motivate teachers to make improvements.[6] This situation is exacerbated by the high workload of supervisors, resulting in sporadic and inconsistent supervision.

Ideally, supervision should be carried out in a scientific, objective, systematic, and collaborative manner. Scientific supervision requires careful planning, valid and reliable instruments, and empirically based feedback that is methodologically accountable.[7] Supervisors act as facilitators and professional mentors for teachers, not merely as evaluators who judge or find fault with teachers.

Through the clinical supervision model, teachers are expected to critically reflect on their teaching practices, receive constructive and applicable feedback, and develop innovations in

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[2] Binti Maunah, (2024).*"Urgensi Supervisi Akademik sebagai Fundamen Profesionalisme Guru,"* Didaktif: Jurnal Pendidikan dan Ilmu Pengetahuan. 24, no. 1 : 34-46.

[3] Arikunto, S., & Yuliana, L. (2022). *Manajemen Pendidikan*. Yogyakarta: Aditya Media Publishing.

[4] Priansa, D. J. (2020). *Pengembangan Strategi dan Model Pembelajaran Inovatif, Kreatif, dan Prestatif dalam Memahami Peserta Didik*. Bandung: CV Pustaka Setia.

[5] Sagala, S. (2021). *Supervisi Pembelajaran dalam Profesi Pendidikan*. Bandung: Alfabeta.

[6] Paryono, P. (2020). "Supervisi Edukatif Kolaboratif Secara Periodik Meningkatkan Kinerja Guru," *Jurnal Ilmiah Pendidikan Profesi Guru*, 3(2): 351-360.

[7] Sahertian, P. A. (2020). *Konsep Dasar dan Teknik Supervisi Pendidikan dalam Rangka Pengembangan Sumber Daya Manusia*. Jakarta: Rineka Cipta.

teaching that are in line with the characteristics of students and the times.[8] With the application of this paradigm, supervision not only improves the competence of individual teachers, but also has a direct impact on improving the quality of learning and national education collectively.

The quality of education is greatly influenced by the competence and professionalism of teachers. Amidst changes in the national curriculum, the integration of learning technology, and the demands of global quality standards, teachers need continuous guidance in order to be able to adapt to these dynamic changes.[9] Scientific supervision is a mentoring process that combines a scientific approach with reflective practice. This process emphasizes needs-based planning, measurable classroom observation, data-based feedback, and continuous, well-monitored follow-up.

The clinical supervision model is one effective implementation of scientific supervision. Through three main stages : Initial meeting, observation, and final meeting,teachers are guided to critically analyze their teaching practices while developing innovative and contextual teaching strategies.[10] Various national and international studies show an increase in teacher competency scores after the implementation of scientific supervision, in terms of pedagogical, professional, and personal aspects. Thus, this article focuses on the concept, influence, and implementation strategies of scientific supervision as a means of professional development for teachers in Indonesia.

Methods

In writing this journal, the author used the literature analysis method, which involves utilizing library resources to obtain theories and limiting activities to library collection materials related to clinical supervision in solving learning problems.

This compilation is based on scientific sources which are then written systematically in accordance with the rules of scientific writing, in this case articles or journals. The results of the writing were then discussed with fellow academics in a presentation discussion and subsequently revised in accordance with the results of the discussion and corrections made by the lecturer in charge of the educational supervision course.

Data collection was conducted using documentation techniques, selecting sources based on their thematic relevance to supervision models and teacher competence (purposive sampling). The data analysis technique used was content analysis, which involved three stages: (1) Data Reduction, identifying key concepts from the literature; (2) Data Display, comparing conventional versus scientific approaches; and (3) Conclusion Drawing, synthesizing findings to formulate strategic recommendations. This method allows for a critical interpretation of existing theories to offer a renewed perspective on supervision practices.

The literature review research method was chosen because it is in line with the characteristics of conceptual studies that aim to explore and analyze various theoretical perspectives on scientific supervision from various published literature. This approach allows researchers to comprehensively synthesize various findings from previous studies and identify patterns and trends in the implementation of scientific supervision.[11]

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[8]Sabandi, A. (2023). "Supervisi Pendidikan untuk Pengembangan Profesionalitas Guru Berkelanjutan," *Pedagogi: Jurnal Ilmu Pendidikan*, 13(1): 1-9.

[9] Musfah, J. (2021). *Peningkatan Kompetensi Guru Melalui Pelatihan dan Sumber Belajar Teori dan Praktik*. Jakarta: Kencana.

[10] Glickman, C. D., Gordon, S. P., & Ross-Gordon, J. M. (2020). *Supervision and Instructional Leadership: A Developmental Approach* (10th ed.). New York: Pearson.

[11] Sugiyono. (2022). *Metode Penelitian Kuantitatif, Kualitatif, dan R&D*. Bandung: Alfabeta.

This compilation is based on scientific sources that are then written systematically in accordance with the rules of scientific writing, which in this case are articles or journals. The data sources used include textbooks, accredited scientific journals, conference proceedings, and research reports relevant to the topic of scientific supervision in the 2015-2024 publication period to ensure the information is up to date.

Data collection techniques were carried out through documentation studies by reading, recording, and analyzing various literature related to scientific supervision, teacher competence, and the development of educator professionalism. Data analysis was carried out descriptively and analytically by identifying main themes, comparing various perspectives, and synthesizing findings to produce a comprehensive understanding.[12]

The results of the writing were then discussed with fellow academics in a presentation discussion and subsequently revised in accordance with the results of the discussion and corrections made by the lecturer in charge of the educational supervision course. This peer review process was important to ensure the validity of the arguments and the quality of the substance of the article produced.

Result

Supervision

1. Definition and Purpose of Scientific Supervision

   Scientific supervision is a systematic and evidence-based professional development process to improve teaching quality and teacher competence through structured observation, objective feedback, constructive guidance, and continuous professional development.[13] Unlike conventional supervision, which tends to be evaluative and top-down, scientific supervision emphasizes a collaborative approach that places teachers as subjects of professional learning, not merely objects of assessment.

   The objectives of scientific supervision cover several interrelated dimensions. First, improving teachers' pedagogical competence in designing, implementing, and evaluating effective learning. Second, improving the quality of learning in the classroom through innovation in methods, strategies, and learning media that are appropriate to the characteristics of the students. Third, developing reflective practices among teachers that enable continuous improvement in educational professionalism.[14]

   In a broader context, scientific supervision aims to build a learning organization culture in schools, where every individual, including teachers, principals, and supervisors, is committed to self-development and continuous quality improvement. Thus, scientific supervision focuses not only on individual improvement but also on institutional transformation that impacts the educational ecosystem as a whole.

2. Key Characteristics of the Scientific Approach

   The scientific approach to supervision has several distinctive characteristics that differentiate it from the conventional approach. First, scientific supervision is based on empirical data: it uses measurable classroom observation results, valid learning assessments, and evidence of actual practice to design follow-up coaching.[15] This data is collected systematically using instruments that have been tested for validity and reliability, thereby minimizing the subjectivity and personal bias of the supervisor.

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[12] Zed, M. (2021). *Metode Penelitian Kepustakaan*. Jakarta: Yayasan Pustaka Obor Indonesia.

[13]Ubogu, R. (2024). "Supervision of Instruction: A Strategy for Strengthening Teacher Professional Development," *Journal of Education (Taylor & Francis)*, 45(2): 156-172.

[14]Sergiovanni, T. J., & Starratt, R. J. (2020). Supervision: A Redefinition (9th ed.). New York: McGraw-Hill.

[15]Kohar, D.A., et al. (2024). "Supervisi Pembelajaran dalam Penjaminan Mutu: Persepsi Guru terhadap Pelaksanaan Supervisi Pendidikan dan Perannya dalam Peningkatan Mutu," *Jurnal Didaktika*, 15(3): 234-248.

Second, scientific supervision is systematic and structured: it has clear and measurable stages, including careful planning, focused observation, in-depth data analysis, constructive feedback, and consistent monitoring of follow-up.[16] Each stage is carefully designed to ensure the effectiveness of the coaching process and the achievement of predetermined goals.

Third, scientific supervision is collaborative and reflective: supervisors work with teachers in a coaching and mentoring paradigm, rather than simply performing administrative controls or formal inspections.[17] This collaborative process creates a space for equal professional dialogue, where supervisors and teachers jointly identify strengths, areas for development, and strategies for improving learning.

Fourth, scientific supervision is developmental rather than merely evaluative (judgmental). The focus of supervision is to help teachers develop their professional potential optimally, not to find mistakes or weaknesses for the sole purpose of performance appraisal. With this developmental orientation, supervision creates a psychological safety for teachers to openly acknowledge difficulties and actively seek solutions for improvement.

3. Implementation Models and Strategies

Several models of scientific supervision that are often used in the literature for the period 2020-2024 include:

a. First, clinical supervision with an intensive observation-analysis-feedback cycle that focuses on specific aspects of learning.[18] This model is very effective for identifying and overcoming learning problems in depth through a systematic diagnostic process.
b. Second, academic supervision by the principal, which places the principal as the main supervisor with the support of school policies as facilitators of teacher development. This model emphasizes the role of the principal's instructional leadership in creating a conducive learning culture.[19]
c. Third, periodic collaborative supervision involving various stakeholders such as senior teachers, subject coordinators, and supervisors in the coaching process. This model utilizes the collective strength of the professional community to learn from each other and support competency development. Fourth, competency-based supervision that focuses on the development of specific competencies in accordance with professional teacher standards.[20]

The choice of supervision model is tailored to the implementation context, including school characteristics (elementary, secondary, madrasah), available resources, and the level of professional maturity of teachers. Flexibility in choosing the appropriate model is key to the successful implementation of scientific supervision in various educational settings.

4. Evidence of the Effectiveness of Scientific Supervision

A systematic review and study of the period 2015-2024 shows that supervision designed as professional development rather than mere administrative control can significantly improve teaching competence and learning quality. This effectiveness is

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[16] Makawimbang, J. H. (2021). *Supervisi dan Peningkatan Mutu Pendidikan*. Bandung: Alfabeta.

[17] Burhanuddin, et al. (2020). *Supervisi Pendidikan dan Pengajaran: Konsep, Aplikasi, dan Penilaian*. Malang: UM Press.

[18] Bjørndal, C. (2024). "Challenges of the Supervision Process in Teacher Education: A Systematic Review," *Teaching and Teacher Education*, 112: 103-118.

[19] Kompri. (2023). *Standarisasi Kompetensi Kepala Sekolah: Pendekatan Teori untuk Praktik Profesional*. Jakarta: Kencana.

[20] Daresh, J. C. (2021). *Supervision as Proactive Leadership* (6th ed.). Illinois: Waveland Press.

particularly evident when supervision is complemented by adequate supervisor training, consistent repeated observation, and continuous follow-up mentoring. [21]

However, the results of the study also show variations in effectiveness depending on several contextual factors: the quality of the implementation of supervision procedures, the support of school leadership, the readiness and openness of teachers to the coaching process, and the availability of supporting resources. This indicates that scientific supervision is not a universal formula that automatically succeeds, but requires contextual adaptation and systemic commitment from all stakeholders.

Scientific Supervision in Educational Practice

1. Concepts and Components of Effective Scientific Supervision

   Scientific supervision is a professional guidance process that is carried out in a planned, systematic, and continuous manner using a scientific approach. All stages begin with planning based on the actual needs of teachers, structured implementation using measurable instruments, objective data collection, in-depth analysis of results, to follow-up that includes solving learning problems and continuous monitoring. [22]

   The basic principles of scientific supervision emphasize several fundamental aspects. First, a clear systematic approach in each step of implementation to ensure consistency and regularity of the process. Second, objectivity of data as the basis for analysis and decision-making, avoiding assessments based solely on subjective perceptions. Third, the use of valid and reliable instruments as the basis for evaluation to ensure the accuracy of the information collected.[23]

   The components of scientific supervision include four main interrelated elements. First, comprehensive supervision program planning, including setting objectives, success indicators, implementation schedules, and resource allocation. Second, structured classroom observation using prepared instruments to record learning data objectively. Third, processing and analyzing observation data to identify strengths and areas for improvement. Fourth, reporting results that serve as material for joint reflection and continuous improvement of the learning process.

2. Clinical Supervision Model

   Scientific supervision in the field of education can be applied through the clinical supervision model. This model is a professional guidance process that aims to improve teacher competence, especially in teaching skills, through systematic stages that include planning, observation, and in-depth analysis.[24] The clinical supervision model was developed based on diagnostic principles that view learning problems as phenomena that need to be identified, analyzed, and addressed systematically, similar to medical diagnoses.The steps in implementing clinical supervision include three main interrelated phases:

   a. Initial Meeting

      The initial meeting is held before the teaching session or practical training in a friendly and open atmosphere. Teachers do not need to worry about being criticized or judged by their supervisors. Likewise, teachers do not need to feel anxious when submitting their training plans, including the methods and tools used to observe their performance. It is hoped that this meeting will result in an agreement (learning contract) between the supervisor and the teacher.[25]

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[21] Berliani, T., Nugroho, P. J., Ernawatie, & Sedek, M. (2023). *"Implementasi Supervisi Pendidikan di Sekolah,"* *Equity In Education Journal*, 5(2): 103-108.

[22] Jabbar, M. R. A. A., Maunah, B., & Eva, H. (2024). *"Peran Supervisi Scientific dalam Meningkatkan Kompetensi dan Profesionalitas Guru di Lembaga Pendidikan Islam,"* *Social: Jurnal Inovasi Pendidikan IPS*, 4(3): 355-362.

[23] Purwanto, M. N. (2020). *Administrasi dan Supervisi Pendidikan*. Bandung: PT Remaja Rosdakarya.

[24] Aurelia, V. A., Maunah, B., & Mutohar, P. M. (2024). "Implementasi Clinical Supervision dalam Menyelesaikan Problematika Pembelajaran," *SKILLS: Jurnal Riset dan Studi Manajemen Pendidikan Islam*, 3(1): 51-59.

[25] Sutomo. (2021). *Supervisi Klinis dalam Pembinaan Profesional Guru*. Yogyakarta: Deepublish.

In this phase, teachers conduct lessons by applying the previously agreed-upon skill elements. On the other hand, supervisors conduct observations using instruments that have also been mutually agreed upon. The aspects to be observed include everything listed in the contract that was approved in the previous meeting. [26]

b. Class observation

The main purpose of this observation is to "capture" everything that happens during the learning process completely and objectively, so that supervisors and teachers can accurately recall the learning process and analyze it scientifically. Supervisors need to maintain objectivity by recording observational facts (observable behaviors), not subjective interpretations or assessments.

The essence of this observation is to cover all learning events so that the data collected can be used later in analysis and feedback. Supervisors can use various observation techniques such as time sampling, event recording, or narrative description depending on the agreed focus of the observation.

c. Final Meeting

Unlike the initial meeting, which can be held several hours or even a day before teaching, the final meeting must be held immediately after teaching is completed, ideally no more than 24 hours later. This is important so that everything that happened remains fresh in the minds of both the supervisor and the teacher, allowing for more accurate and in-depth reflection.

This final meeting is a collaborative discussion to provide feedback between the supervisor and the teacher. The atmosphere of this meeting is the same as that of the initial meeting, namely friendly, open, and without any elements of judgment or criticism that could cause the teacher to become defensive.[27]

The supervisor presents the data in a way that allows the teacher to identify their own strengths and weaknesses through a guided reflection process. Effective questioning techniques can help teachers become aware of areas that need improvement, which is far more effective than directives or direct instructions from the supervisor.

In this situation, supervisors are required to be patient and apply good interpersonal communication skills so as not to get caught up in evaluating, judging, or dictating to teachers. A non-directive and democratic approach is more effective in encouraging teachers to take ownership of the process of improving their teaching.

The starting point for this development is the agreed contract; at the meeting, teachers are expected to recognize the extent to which the contract can be achieved. The discussion also covers concrete follow-up plans that teachers will implement for improvement, as well as agreements on the support that supervisors will provide in the implementation process.

3. Impact on Improving Teachers' Professional Competence

The implementation of scientific supervision has a real impact on improving teachers' competence and professionalism. Various studies report results showing an increase in the average score of teacher competency from the adequate category with a score of 71 to the good category with a score of 87 after the consistent and continuous

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[26] Acheson, K. A., & Gall, M. D. (2020). *Clinical Supervision and Teacher Development: Preservice and Inservice Applications* (7th ed.). New York: Wiley.

[27] Karmila, N., & Suchyadi, Y. (2020). "Supervisi Pendidikan Di Sekolah Alam Bogor," *JPP Guseda: Jurnal Pendidikan & Pengajaran Guru Sekolah Dasar*, 3(1): 31-33.

implementation of scientific supervision.[28]This data confirms that scientific supervision not only helps teachers improve their teaching methods technically, but also encourages an overall improvement in professional quality, both in pedagogical and managerial aspects, as well as in scientific development.

The main objective of clinical supervision is to "improve teacher performance in the learning process and help students overcome learning problems effectively." The iterative guidance process through a cycle of initial meetings, observations, and final meetings helps teachers have a significant impact on improving their professional competence, particularly in the following areas:

a. First, improving teaching methods. Teachers become more varied in their use of learning strategies and are able to adapt their approach to the characteristics of the students, the learning material, and the objectives to be achieved. Scientific supervision helps teachers move out of their comfort zone of conventional methods towards more effective learning innovations.[29]
b. Second, developing questioning and classroom management skills. Teachers improve their ability to ask questions that stimulate students' critical thinking (higher order thinking), manage classroom dynamics effectively, and create a conducive learning environment for all students.
c. Third, solidify learning strategies. Teachers become more confident and competent in designing and implementing learning strategies that are in line with the principles of active, creative, and meaningful learning.

Thus, the implementation of clinical supervision contributes significantly to the continuous improvement of teacher professionalism. The repetitive and systematic process allows for the internalization of new skills and the formation of habits of excellence in teacher learning practices.[30]

Influencing Factors and Obstacles

The success of scientific supervision is influenced by a number of important factors that interact in complex ways.

a. First, careful and structured planning is the main foundation for effective activities and the achievement of expected goals. Planning includes setting SMART (Specific, Measurable, Achievable, Relevant, Time-bound) goals, identifying teacher needs, and designing a comprehensive supervision program.
b. Second, the use of valid and reliable evaluation instruments ensures the objectivity of supervision data. Good instruments must have strong construct validity and have been tested for reliability so that they can measure aspects of teacher competence accurately and consistently.[31]
c. Third, the sustainability of the follow-up process and evaluation of results plays a role in maintaining continuous improvement. Supervision should not stop at providing feedback, but must be followed up with monitoring the implementation of improvements and ongoing support until teachers have truly mastered new skills.

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[28] Supardi. (2022). *Kinerja Guru*. Jakarta: PT RajaGrafindo Persada.

[29] Rusman. (2021). *Model-Model Pembelajaran: Mengembangkan Profesionalisme Guru*. Jakarta: PT RajaGrafindo Persada.

[30] [30]Danim, S., & Khairil. (2020). *Profesi Kependidikan*. Bandung: Alfabeta.

[31] Sudjana, N. (2021). *Standar Kompetensi Pengawas Dimensi dan Indikator*. Jakarta: Binamitra Publishing.

d. Fourth, support for teacher professional development programs such as upgrading education levels, certification, training, and education and training are another important element that strengthens the results of supervision. These programs provide new knowledge and skills that can be integrated into the supervision process.[32]
e. Fifth, collective activities such as teacher working groups (KKG), subject teacher deliberations (MGMP), literacy movements, and scientific paper writing also contribute to the success of supervision. These activities create professional learning communities that support each other in competency development.
f. Sixth, the role of school leadership and the use of information technology further strengthen the implementation of scientific supervision as a whole. The principal, as the instructional leader, needs to provide policy support, resources, and motivation to the entire school community to commit to continuous professional development.

Barriers to the Implementation of Scientific Supervision

Problems in learning cannot be separated from the various factors that influence it. Several elements that hinder the implementation of scientific supervision include:

1. Learning Approach Factors

   Learning often begins with existing problems in society, such as environmental issues, parents' socioeconomic backgrounds, and the prevailing education system. However, learning has so far focused more on cognitive-behavioral aspects, while many students are not yet able to appreciate diversity awareness and develop social-emotional skills.[33] Therefore, it is important for supervisors and teachers to treat students with care and patience, considering that they are individuals who are in the process of holistic development.
2. Dynamic Curriculum Changes

   In the Indonesian education system, frequent curriculum changes can be confusing for teachers and students. For example, just as teachers and students begin to understand and adapt to the School-Based Curriculum (KTSP), they suddenly have to adapt to the 2013 Curriculum, and then the Merdeka Curriculum appears.[34] The curriculum serves as a guideline for teachers in delivering material to students in order to achieve learning objectives. Changes that are too rapid without adequate socialization and training can hinder the effectiveness of supervision because teachers are still in the process of adapting to the new curriculum paradigm.
3. The Factor of Heterogeneous Teacher Competence

   Teacher qualifications and professionalism greatly influence student learning success in school. If a teacher has good competence, students tend to be able to apply their understanding not only at school but also at home and in their daily lives.[35]Furthermore, a teacher who has high professionalism and in-depth knowledge will find it easier to explain material to students in an effective and contextual manner.

Quality education is very important in the national education system so that students have the necessary skills to face technological developments and increasingly

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[32] Suyanto, & Jihad, A. (2023). *Menjadi Guru Profesional: Strategi Meningkatkan Kualifikasi dan Kualitas Guru di Era Global*. Jakarta: Erlangga.

[33] Daryanto, & Tasrial. (2022). *Konsep Pembelajaran Kreatif*. Yogyakarta: Gava Media.

[34] Fadlillah, M. (2021). *Implementasi Kurikulum 2013 dalam Pembelajaran SD/MI, SMP/MTs, & SMA/MA*. Yogyakarta: Ar-Ruzz Media.

[35] Uno, H. B., & Lamatenggo, N. (2023). *Tugas Guru dalam Pembelajaran: Aspek yang Mempengaruhi*. Jakarta: Bumi Aksara.

complex future challenges. Schools also play a role in shaping students' characters to be more noble and moral in accordance with the values of Pancasila and religious teachings.

However, reality shows that teacher competence is still very heterogeneous. There are teachers who are already very competent and innovative, but there are also those who still need intensive guidance. This heterogeneity poses a challenge for supervisors to design supervision programs that can accommodate the needs of teachers with different levels of competence (differentiated supervision).

Strategic Recommendations to Improve Effectiveness

To improve the effectiveness of scientific supervision in a comprehensive and sustainable manner, the following strategic steps are recommended:

1. Creating a Conducive Supervision Climate

   Conduct supervision in a friendly and open atmosphere, rather than in an authoritarian or judgmental manner.[36] Supervisors need to develop good interpersonal communication skills, including active listening, empathy, and the ability to provide constructive feedback. A climate of psychological safety will encourage teachers to be more open in acknowledging difficulties and actively seeking solutions for improvement without fear of being judged or punished.
2. Ensuring Objectivity through Valid Instruments

   Ensure systematic observation and objective feedback so that teachers can see their own strengths and weaknesses through factual data.[37] The use of valid and reliable observation instruments, such as competency-based assessment rubrics, teaching skills checklists, or digital applications for recording learning data, will increase the accuracy and credibility of the supervision process.
3. Optimizing the Role of Principals

   Give principals an active role as the main supervisors in planning teacher development policies, coordinating educational programs, and systematically solving curriculum issues. Principals need to be equipped with adequate instructional leadership training so that they can carry out their supervisory functions effectively.[38]
4. Integrating Technology into Supervision

   Utilize digital technology for learning documentation, data analysis, video coaching, and remote mentoring (e-supervision). Digital platforms can facilitate more efficient classroom observation, teacher portfolio storage, and ongoing communication between supervisors and teachers. Technologies such as learning management systems (LMS), classroom observation applications, and video conferencing can expand the reach and increase the frequency of supervision.[39]
5. Building Professional Practice Communities

   Develop a collaborative culture through lesson study, peer observation, professional learning communities (PLC), and action research. These activities enable teachers to learn from each other's best practices, share experiences, and collectively solve learning problems. Collaboration among teachers can be an effective complement to formal supervision by principals or supervisors. [40]
6. Continuing Education for Supervisors

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[36] Nawawi, H. (2020). *Administrasi Pendidikan*. Jakarta: Gunung Agung.

[37]Imron, A. (2021). *Supervisi Pembelajaran Tingkat Satuan Pendidikan*. Jakarta: Bumi Aksara.

[38] Wahjosumidjo. (2022). *Kepemimpinan Kepala Sekolah: Tinjauan Teoritik dan Permasalahannya*. Jakarta: PT RajaGrafindo Persada.

[39]Siahaan, A., & Dewi, K. S. (2023). "Pemanfaatan Teknologi Digital dalam Supervisi Pembelajaran Era Digital," *Jurnal Teknologi Pendidikan*, 12(2): 145-158.

[40] Hord, S. M., & Roussin, J. L. (2021). *Implementing Change Through Learning: Concerns-Based Concepts, Tools, and Strategies for Guiding Change*. California: Corwin Press.

Conduct specialized training for supervisors and principals on modern supervision techniques, coaching skills, constructive feedback skills, learning data analysis, and the development of valid supervision instruments. Supervisor competence greatly determines the quality of supervision, so investing in the professional development of supervisors is a strategic priority.[41]

7. Scheduling Regular and Measurable Supervision

Establish a regular and consistent supervision schedule, not just incidental or prior to performance appraisals. Supervision needs to be carried out periodically, for example once a month or once every two months, with sufficient duration to conduct in-depth observations and provide comprehensive feedback. Continuity and consistency in supervision are essential to ensure continuous improvement.[42]

Table 1. Educational Supervision Quadrant

Quadrant	Orientation	Main Focus	Strategic Implication
I. Administrative–Control	Control-based	Compliance with regulations, documentation, and discipline	Effective for ensuring policy implementation but less supportive of teacher innovation
II. Developmental–Control	Control-based	Performance evaluation and quality assurance	Requires valid instruments to maintain objectivity and accuracy in supervision
III. Administrative–Collaborative	Collaboration-based	Coordination and communication between supervisors and teachers	Strengthens leadership and teamwork through shared decision-making
IV. Developmental–Collaborative	Collaboration-based	Teacher professional growth, reflection, and innovation	Represents the ideal model for sustainable, technology-integrated supervision

Conclusion

Scientific supervision acts as a critical bridge between administrative requirements and the genuine need for professional growth. Through a comprehensive library analysis, this study concludes that shifting from subjective inspection to an evidence-based, systematic, and collaborative approach directly addresses the root causes of stagnant teacher competence. The success of this model relies not just on procedural steps, but on the cultural transformation of the school where data is used for improvement, not judgment. Integrating digital tools into supervision instruments is identified as a necessity to ensure validity in the modern educational landscape.

[41] Zepeda, S. J. (2022). *Instructional Supervision: Applying Tools and Concepts* (5th ed.). New York: Routledge.

[42] Danielson, C. (2020). *The Framework for Teaching Evaluation Instrument. Princeton: The Danielson Group.as* (*Observation).*

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