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Research Article

Education Quality Assurance Across School Levels in Tegal: Differentiated Instruction, Digitalization, and Stakeholder Involvement

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Abstract
Educational quality assurance is meaningful when internal quality-assurance processes inform classroom improvement rather than only administrative compliance. This exploratory study describes perceived quality-assurance conditions across selected education levels in Tegal, Indonesia, focusing on differentiated instruction, digital infrastructure, and stakeholder engagement. A descriptive mixed-methods approach combined a five-point questionnaire covering four quality dimensions with open-ended responses from 11 purposively selected participants, including teachers, school supervisors, and parent or committee representatives. Means were summarized descriptively and reported qualitative responses were grouped thematically, then compared in an integration matrix. Curriculum and learning implementation obtained the highest reported mean (4.12, Good), whereas facilities, infrastructure, and the learning environment had the lowest (3.25, Fair). The narrative material concerned differentiation and accessibility, resource constraints, compliance-oriented quality routines, and family-school communication. The synthesis suggests prioritizing supportive academic supervision, collaborative professional learning, accessible digital and adaptive resources, formative evaluation, and context-sensitive partnerships. Because the study uses a small non-probability sample, lacks available instrument-level psychometric evidence, and does not document an explanatory link between data-collection phases, the findings describe local perceptions rather than system-wide effectiveness or causal effects.

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Introduction

Improving educational quality requires connecting curriculum planning, teaching practice, and continuous institutional self-evaluation. In Indonesia, the *Merdeka* Curriculum and the Internal Quality Assurance System (*Sistem Penjaminan Mutu Internal*, SPMI) are intended to support responsive teaching and school improvement. The regulatory context includes Minister of Education and Culture Regulation No. 28 of 2016 and Minister of Primary and Secondary Education Regulation No. 21 of 2026 (Kementerian Pendidikan dan Kebudayaan, 2016; Kementerian Pendidikan Dasar dan Menengah, 2026). Research on quality assurance highlights a persistent distinction between formal accreditation processes and organizational learning; evaluation becomes more useful when stakeholder voices and evidence-based school improvement are connected (Kumar et al., 2025; van den Boom-Muilenburg et al., 2023).

Perceived implementation conditions vary by school level and resources. Kindergarten education, primary and special education, junior secondary schools, and upper-secondary or

vocational institutions differ in curriculum demands, learner needs, equipment requirements, and partnership structures. In vocational education, work-based learning and industry alignment require deliberate collaboration, while school-wide quality processes depend on leadership and collective action (Tobback et al., 2025; Holst et al., 2025). This study examines these differences within a small, purposively selected group of informants in Tegal; it does not assume that the respondents statistically represent all schools in the region.

Education quality cannot be inferred solely from curriculum documents or the existence of a quality-assurance system. Quality routines require institutional follow-through, formative feedback, and professional collaboration. Classical organizational theory describes how formal structures can become ceremonial (Meyer & Rowan, 1977), while quality-management perspectives emphasize continuous improvement (Sallis, 2002). Empirical research has linked professional learning communities with teacher collaboration, job satisfaction, and context-dependent changes in instructional quality (Christensen & Jerrim, 2025; Huijboom et al., 2023; Liu & Yin, 2024). Indonesian discussions of school-based quality assurance also raise questions about implementation beyond administrative compliance (Arifianto & Abdullah, 2022; Ula & Bakar, 2021).

Differentiated instruction involves responding to variation in learning readiness, opportunities, and support needs rather than treating a single teaching plan as universally sufficient (Faiz et al., 2022; Smale-Jacobse et al., 2019; Tomlinson, 2017). Research documents the importance of teachers' professional vision, assessment, self-efficacy, sustained preparation, and enabling school conditions (Gheyssens et al., 2021; Griful-Freixenet et al., 2021; Kalinowski et al., 2024; Langelaan et al., 2024). Reviews caution that differentiation is inconsistently defined and not automatically effective in all settings (Graham et al., 2021; Lindner & Schwab, 2025). For learners with disabilities, inclusive practice also depends on accommodations and accessible learning resources (Baek et al., 2024; Florian & Black-Hawkins, 2011; Hata et al., 2023; Mais & Yaum, 2025; Yang et al., 2024). Digital disparities compound these issues because equitable integration requires infrastructure, pedagogical use, and teacher support (Hong et al., 2024; Mustafa et al., 2024; Weisberg & Dawson, 2024).

In educational technology, research emphasizes that devices alone do not close learning gaps. Professional learning communities can support teachers' instructional adoption of digital resources, while the ethical use of artificial intelligence requires attention to privacy, transparency, fairness, teacher judgment, and the specific needs of K–12 learners (Celik et al., 2022; Liu et al., 2024; Mouta et al., 2024; Tagare et al., 2025). Recent work on school inspection and accreditation similarly argues for processes attentive to local needs and stakeholder participation (Kumar et al., 2025).

Research has generally addressed quality assurance, differentiated instruction, digital access, leadership, and parent participation in separate strands. For example, international evidence connects instructional leadership with teachers' efficacy, while studies of family engagement distinguish supportive home–school relationships from simple attendance at school meetings (Hallinger et al., 2025; Koivuhovi et al., 2025; Povey et al., 2025). This article contributes a context-bound synthesis of perceived SPMI conditions across several educational settings in Tegal. It aims to (1) describe the four reported quality-assurance scores, (2) interpret respondent-reported challenges using a thematic framework, and (3) propose proportionate improvement priorities. The contribution is an exploratory cross-level description rather than proof of differences among entire school sectors or of the effectiveness of proposed interventions.

Method

Research Design

The submitted study combines descriptive ratings and open-ended accounts to examine quality-assurance conditions across school levels. The design was described in the source manuscript as explanatory sequential mixed methods; however, the available report does not establish whether the quantitative findings informed the selection of qualitative respondents or the wording of subsequent questions. Therefore, it is described here conservatively as a descriptive mixed-methods study with an explanatory integration objective. Strict explanatory sequential designs require explicit connections between stages, such as building follow-up questions from quantitative results (Creswell & Plano Clark, 2018; Fetters & Tajima, 2022; Hwang et al., 2025; Jackson-Gordon & Plano Clark, 2024; Younas & Durante, 2023).

Participants

The study was situated in Tegal, Central Java, Indonesia. Eleven participants were purposively selected from educational and stakeholder groups reported to include teachers in regular and special education, school supervisors, and school committee or parent representatives. The distribution by school level and employment duration is shown in Table 1. The source report did not provide participant-level identifiers, a cross-tabulation of school level and occupation, the recruitment dates, or whether all 11 respondents contributed to both strands. For this reason, the descriptive sample is not treated as a representative estimate of all education units in Tegal.

Instruments and Data Collection

The reported quantitative instrument was a closed-ended five-point Likert-type questionnaire (5 = Strongly Agree to 1 = Strongly Disagree), addressing (A) curriculum and learning implementation, (B) competence and human-resource development, (C) facilities, infrastructure, and the learning environment, and (D) leadership, governance, and quality culture. Qualitative material was obtained through open-ended questions about barriers and proposed responses. The submitted materials do not specify item counts by dimension, item wording, pilot testing, expert validation, reliability coefficients, or the dates and sequence of the two stages. These details are necessary for a full evaluation of measurement quality and must be confirmed from the original research records before publication. No coefficients are estimated without item-level responses.

Data Analysis

Quantitative reporting is limited to the four dimension means and the original descriptive class intervals: 1.00–1.80 = Very Poor, 1.81–2.60 = Poor, 2.61–3.40 = Fair, 3.41–4.20 = Good, and 4.21–5.00 = Very Good. Frequencies in Table 1 were inferred arithmetically from the reported percentages with N = 11, rather than retrieved from a respondent-level dataset. The reported open-ended material was organized under four pre-existing themes with reference to thematic analysis (Braun & Clarke, 2006); the source paper does not provide a coding audit trail, intercoder agreement, or original transcriptions for reanalysis. Table 3 juxtaposes the two forms of evidence but does not imply statistical testing or causal explanation. Methodological discussion of joint displays supports such explicit, bounded interpretation (Fetters & Tajima, 2022; Jackson-Gordon & Plano Clark, 2024).

Ethics and data governance. The source manuscript contains an anonymized, English-translated teacher quotation, but it does not document the original consent procedure, institutional ethics determination, or translation verification. These items should be supplied by the researchers

from their field records. No ethical clearance number, respondent consent, or interview activity is asserted in this revision without supporting documentation.

Result and Discuss ion

Quantitative Results

The 11 respondents were associated with several reported educational settings and different lengths of service (Table 1). The four school-level categories account for all 11 respondents after rounding; "school supervisor" is therefore presented as an additional role descriptor, not a fifth mutually exclusive school-level category. Individual-level overlap still requires confirmation by the authors. The purposive composition provides perspectives from varied settings but cannot establish population proportions.

Table 1. Respondent characteristics (N = 11).

Characteristic	Category	n	Percentage (%)
School level	Kindergarten (TK ABA Procot)	2	18.2
	Primary/special primary (SD/SDLB)	4	36.4
	Junior high (SMP)	3	27.3
	Senior high/vocational (SMA/SMK)	2	18.2
Additional role (non-exclusive)	School supervisor	1	9.1
Length of service	Less than 5 years	3	27.3
	5–10 years	4	36.4
	More than 10 years	4	36.4

Note. n values are calculated from reported percentages for N = 11; percentages may total 100.1% because of rounding. School supervisor is a role descriptor that may overlap with school-level classifications and is not included when summing school-level percentages. Actual individual-level coding requires author verification.

Table 2 and Figure 1 summarize the reported mean ratings across four dimensions. Curriculum and learning implementation had the highest descriptive mean (4.12; Good), whereas facilities, infrastructure, and the learning environment had the lowest (3.25; Fair). Leadership, governance, and quality culture (3.88) and competence and human-resource development (3.65) also fell within the Good interval. These figures describe the 11 respondents' ratings and do not measure changes in student learning or the average conditions of all schools in Tegal.

Table 2. Quality achievement by evaluation dimension (scale 1–5)

Dimension	Mean	Category	Key achievement indicator
A. Curriculum and Learning Implementation	4.12	Good	Respondents described comparatively consistent preparation of teaching materials.
B. Competence and Human Resource Development	3.65	Good	Teacher forum participation was reported, while periodic follow-up was perceived as limited.
C. Facilities, Infrastructure, and Learning Environment	3.25	Fair	Reported limitations included adaptive media and IT/practical equipment.
D. Leadership, Governance, and Quality Culture	3.88	Good	Leadership intentions appeared positive, alongside concerns about documentation-oriented SPMI.

Note. Categories follow the source manuscript: 1.00–1.80 = Very Poor; 1.81–2.60 = Poor; 2.61–3.40 = Fair; 3.41–4.20 = Good; 4.21–5.00 = Very Good. The underlying item-level data were not supplied for independent recalculation.

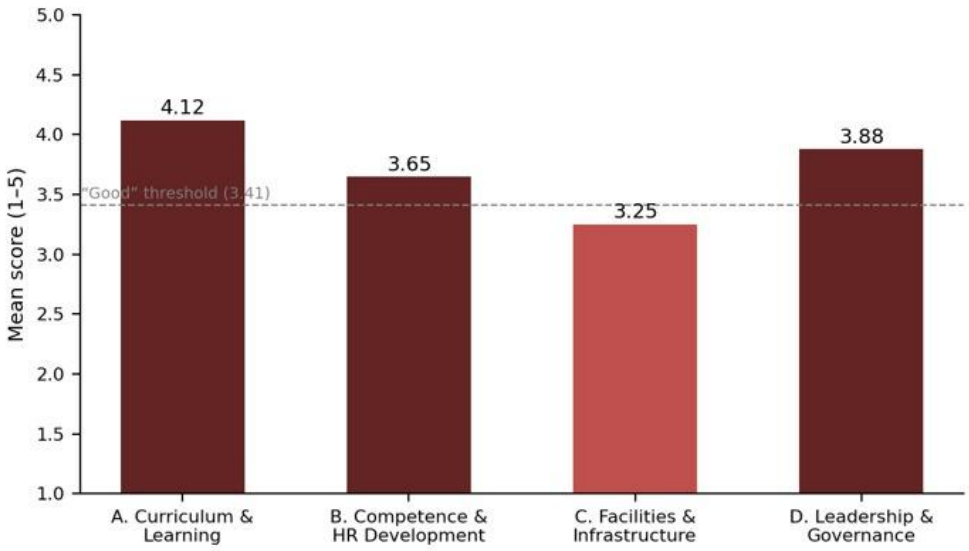


Fig 1. Mean scores for the four quality dimensions (descriptive, N = 11).

Qualitative Findings

Four themes were reported in the open-ended material. Because the source report does not include complete transcripts or coded excerpts for every respondent, the themes are presented as descriptive interpretations of reported accounts, not independently reverified frequencies or causal explanations.

Theme 1: The Complexity of Differentiated Instruction and Inclusion

The submitted qualitative report describes difficulties with differentiated instruction and individualized learning planning in special-primary settings. Respondents referred to the time required to prepare individual learning programmes and to limited access to adaptive materials and specialist support. One SLB teacher provided the following illustrative account:

"The hardest challenge comes from each child's uniqueness. Their cognitive and motor abilities are not uniform, so it is impossible to use one approach for everyone. Preparing the PPI takes time and great precision, yet adaptive media and sensory teaching aids are still very limited ..." (SLB teacher respondent; translation reported in the source manuscript; original Indonesian text was not supplied for verification).

Theme 2: Technology Infrastructure Gaps and School Scale

Participants described technology-related constraints in some schools, including shortages of computer laboratories, adaptive teaching media, and vocational practical equipment. Accounts from smaller schools also mentioned limitations in operating resources and maintenance. These findings are respondents' reported experiences rather than quantified estimates of a regional digital divide.

Theme 3: Evaluation Routines and SPMI Formalism

In the submitted open-ended responses, some participants characterized quality-assurance activities as documentation-heavy and performance evaluation as insufficiently frequent. The evidence does not establish how many of the schools in Tegal operate in this way. It identifies a potential implementation problem that should be corroborated with SPMI documents, supervision records, and observation.

Theme 4: Perceived Changes in Family Participation

Some respondents perceived weaker conventional family participation at higher school levels. No quantitative family-participation dimension or longitudinal measure was included in the questionnaire, so the qualitative accounts do not establish the frequency or magnitude of a decline.

Integration of Quantitative and Qualitative Findings

Table 3 juxtaposes the four reported quantitative dimension scores with the themes derived from open-ended responses. It is a descriptive joint display, not evidence of a causal association. Family participation (Theme 4) has no directly corresponding quantitative dimension.

Table 3. Joint display of descriptive ratings and reported qualitative themes

Quantitative finding	Explaining qualitative theme	Implication
Dimension C mean 3.25 (Fair)	Themes 1–2: reported shortages of adaptive media, computer labs, and practical equipment.	Proposed response: school-specific infrastructure and accessibility needs assessment.
Dimensions B mean 3.65 and D mean 3.88 (Good)	Theme 3: reported administrative emphasis and limited formative follow-up.	Proposed response: supervised, documented teacher-feedback cycles.
Dimension A mean 4.12 (Good)	Theme 1: curriculum-document preparation may outpace differentiated classroom support.	Proposed response: observe and support actual classroom adaptation.
No quantitative family-engagement indicator	Theme 4: some accounts described limited conventional family participation.	Proposed response: examine age-appropriate home–school partnerships.

Discussion

Viewed together, the higher mean for curriculum and learning implementation (4.12) and the lower mean for facilities and learning environment (3.25) suggest a perceived mismatch between instructional planning and material support. However, ratings from 11 purposively selected respondents cannot establish a causal relationship or be generalized to all schools in Tegal. Studies of quality assurance emphasize that evaluation becomes meaningful when it informs instructional improvement rather than merely documenting compliance (Kumar et al., 2025; van den Boom-Muilenburg et al., 2023).

The account is compatible with literature indicating that differentiation requires specific classroom assessment and ongoing professional development rather than uniform teaching materials alone (Graham et al., 2021; Kahmann et al., 2024; Kalinowski et al., 2024; Pozas et al., 2020; Pozas et al., 2021; Pozas et al., 2022). It should not be interpreted as a measured effect of differentiation on student achievement in the present study.

The source report also describes the challenge of aligning national, international, and religious or local curricular expectations in some school settings. Such perceived demands may increase lesson-planning complexity, but the present dataset does not permit estimating the size of this burden or comparing schools statistically. International research on teacher preparation emphasizes sustained professional learning, assessment capability, and realistic organizational conditions (Griful-Freixenet et al., 2021; Langelaan et al., 2024; Lindner & Schwab, 2025).

These qualitative descriptions suggest a gap between curriculum expectations and available pedagogical support. Adaptive resources, teacher coaching, and inclusive lesson-design opportunities may help, but their effects were not tested in Tegal. Research on differentiated practice

and special educational needs supports attention to teacher competence and resources, while cautioning against assuming that one model fits all settings (Baek et al., 2024; Mais & Yaum, 2025; Mumpuniarti et al., 2020; Suprihatiningrum, 2021).

The reported concerns about limited school operating resources and maintenance imply that digital transformation should be assessed through local needs, technical support, and teaching design as well as device provision. Research indicates that peer collaboration and digital professional development can support the integration of resources into instruction (Liu et al., 2024), while documented rural-school barriers often involve contextual and organizational conditions, not equipment alone (Mustafa et al., 2024). This study does not contain school-level budget records capable of quantifying those constraints.

For vocational schools, respondents pointed to the potential mismatch between the pace of industrial technology change and the replacement of practical training equipment. Such concerns are consistent with research highlighting the need to align work-based learning and vocational outcomes (Tobback et al., 2025). However, the present manuscript includes no direct industry assessment or graduate-employment data. The teaching factory strategy discussed in Indonesian literature (Suryati, 2023) is therefore proposed as a possible partnership route, not an evaluated program outcome.

These observations support context-sensitive planning for adaptive learning resources, technology support, and vocational partnerships. Prioritization should begin with an inventory of actual school needs, supported by transparent resource and access indicators. The recommendations remain prospective and require testing in schools with different sizes, student populations, and infrastructure conditions (Holst et al., 2025; Weisberg & Dawson, 2024).

The distinction between formal compliance and operational improvement is compatible with institutional perspectives on ceremonial adoption (Meyer & Rowan, 1977). More recent work shows that sustaining data-use professional learning communities depends on leadership and organizational routines (van den Boom-Muilenburg et al., 2023), while quality-assurance scholarship emphasizes stakeholder engagement and contextual evaluation (Kumar et al., 2025). Thus, the local accounts warrant further examination rather than a population-level judgment about SPMI implementation.

The source participants described a need for more frequent and useful teaching feedback. Evidence from reviews and meta-analyses supports teacher coaching and formative feedback, although the size of their effects depends on design and setting (Kraft et al., 2018; Röhl et al., 2025; Yao et al., 2024). A proposed semester-based feedback cycle should therefore be evaluated with clearly defined measures and implementation records rather than assumed to improve outcomes by itself.

Instructional leadership and professional learning communities offer relevant mechanisms for strengthening quality culture (Hallinger et al., 2025; Robinson et al., 2008; Liu & Yin, 2024; Mydin et al., 2024). Cross-national analyses indicate that professional learning community effects are context-dependent (Christensen & Jerrim, 2025), and sustained teacher learning benefits from purposeful collaborative inquiry (Babichenko et al., 2024; Huijboom et al., 2023). These sources support the rationale for professional development but do not validate the present study's suggested program.

The perceived changes in family participation merit a distinct interpretation. Family involvement need not be measured solely by attendance at school activities, because academic communication and forms of support may differ with learners' ages and educational contexts (Hill & Tyson, 2009; Koivuhovi et al., 2025; Povey et al., 2025). Accordingly, the present accounts suggest questions for further investigation, rather than demonstrating a statistically significant cross-level decline.

The joint display clarifies how descriptive ratings and the open-ended themes may be read together, but it does not demonstrate that qualitative sampling or questioning was explicitly designed around particular quantitative cases. Methodological scholarship stresses the need to document the links between stages, the points of integration, and the resulting meta-inferences in mixed-methods research (Fetters & Tajima, 2022; Hwang et al., 2025). Theme 4 also remains a qualitative-only finding because family participation was not rated in the four-dimension questionnaire.

The following proposals synthesize participants' reported challenges with international research. They are options for subsequent evaluation, not interventions tested or shown to be effective by the present dataset.

One implication is to strengthen coaching-oriented academic supervision. School leaders and supervisors could provide actionable, classroom-specific feedback linked to learning needs, accessibility, and the evidence available in the Education Report Card. External reviews of teacher coaching and instructional leadership provide a rationale for such support (Hallinger et al., 2025; Kraft et al., 2018), but implementation fidelity and student outcomes should be monitored locally.

Teacher learning communities could also support sustained instructional inquiry. KKG/MGMP activities might combine collaborative planning, lesson observation, and reflection rather than focusing only on administrative products. Research links professional learning communities with teacher development and context-sensitive school improvement (Babichenko et al., 2024; Huijboom et al., 2023; Liu & Yin, 2024; Mydin et al., 2024). The feasibility of a lesson-study cycle in the participating schools requires assessment (Lewis et al., 2006).

Adaptive and ethically governed digital practices represent another potential priority. Assistive devices, shared resources, and appropriate teacher training could be prioritized according to learner needs. AI may support drafting, feedback, and differentiated materials, but its use requires human oversight, accessibility, protection of personal information, and attention to bias (Celik et al., 2022; Holmes et al., 2022; Mouta et al., 2024; Tagare et al., 2025). This article does not claim that AI tools were implemented or tested during the study.

Schools may additionally pilot a regular formative-evaluation cycle. Rather than assuming an annual review to be ineffective, education units could trial additional feedback points during the year and examine documented improvements. Evidence on formative assessment and student feedback supports a cycle of specific feedback and reflection, with impacts varying by context (Röhl et al., 2025; Yao et al., 2024). Any semester-based schedule should reflect local policy and staff capacity.

Finally, context-sensitive partnerships could align family communication with learners' age and needs while involving vocational partners when equipment or work-based experiences are required. International research suggests that family engagement and vocational partnerships should be tailored rather than standardized across levels (Koivuhovi et al., 2025; Povey et al., 2025; Tobback et al., 2025).

The study has several limitations. The 11 purposively selected respondents do not support statistical generalization to the schools of Tegal. Individual-level classifications and stage-by-stage recruitment cannot be verified from the source report; the supervisor role overlaps the school-level table, and its exact allocation needs author confirmation. No respondent-level dataset, item wording, reliability estimates, validity evidence, or detailed coding audit trail was provided. The mixed-methods design therefore cannot conclusively be classified as explanatory sequential, and the qualitative themes should not be interpreted as measured regional trends. Family participation had no quantitative dimension. Ethical procedures, original-language quotation, and the chronology of data collection also require author verification. Future research should use transparent sampling, document and observation triangulation, psychometrically evaluated instruments, and explicit links between quantitative and qualitative phases before testing proposed quality-improvement interventions.

Conclusion

This study examined the perceived implementation of educational quality assurance across different school levels in Tegal, Indonesia, focusing on differentiated instruction, digital infrastructure, institutional governance, and stakeholder involvement. The findings revealed that curriculum and learning implementation achieved the highest mean score (4.12), followed by leadership, governance, and quality culture (3.88) and competence and human resource development (3.65), whereas facilities, infrastructure, and the learning environment received the lowest score (3.25). These results indicate a perceived discrepancy between curricular readiness and the institutional resources required to support effective, inclusive, and sustainable educational practices. Qualitative findings further identified challenges associated with differentiated instruction, inadequate adaptive learning resources, compliance-oriented quality assurance procedures, and variations in family–school engagement. Theoretically, this study contributes to understanding educational quality assurance as a multidimensional and context-dependent process in which institutional accountability must be integrated with pedagogical responsiveness, organizational learning, and stakeholder collaboration. Methodologically, the integration of descriptive quantitative indicators and qualitative accounts provides an exploratory framework for identifying institutional improvement priorities across educational settings. From a practical perspective, the findings highlight the importance of strengthening teacher professional development, improving equitable access to digital and adaptive learning resources, implementing formative academic supervision, and developing collaborative partnerships responsive to institutional and learner diversity. Nevertheless, the study is constrained by its limited purposively selected sample of 11 participants, geographically specific context, incomplete instrument validation evidence, and insufficient documentation of the connections between quantitative and qualitative data collection. Consequently, the findings should be interpreted as preliminary insights into stakeholder perceptions rather than representative assessments or causal evidence of educational quality assurance effectiveness. Future research should incorporate larger and more diverse samples, validated measurement instruments, longitudinal or comparative research designs, and systematically integrated mixed-methods procedures to examine how institutional conditions influence instructional quality and educational outcomes. Ultimately, this study underscores the necessity of transforming educational quality assurance from predominantly administrative compliance into a continuous, inclusive, evidence-informed improvement process that strengthens

institutional capacity, advances educational equity, and supports sustainable educational development.

References

Arifianto, A. N., & Abdullah, D. (2022). *Implementation of the internal quality assurance system to improve basic education quality*. Multiverse: Open Multidisciplinary Journal, 1(2), 98–105. https://doi.org/10.57251/multiverse.v1i2.602

Babichenko, M., Lefstein, A., & Asterhan, C. S. C. (2024). Teacher collaborative inquiry into practice in school-based learning communities: The role of activity type. Learning, Culture and Social Interaction, 49, 100852. https://doi.org/10.1016/j.lcsi.2024.100852

Baek, C., Aguilar, S. J., & Warschauer, M. (2024). Exploring teachers' self-efficacy and willingness to provide accommodations in teaching students with autism: An intervention study. Teaching and Teacher Education, 140, 104488. https://doi.org/10.1016/j.tate.2024.104488

Bates, A. W. (2019). Teaching in a digital age: Guidelines for designing teaching and learning (2nd ed.). Tony Bates Associates Ltd. https://pressbooks.bccampus.ca/teachinginadigitalagev2/

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. Qualitative Research in Psychology, 3(2), 77–101. https://doi.org/10.1191/1478088706qp063oa

Celik, I., Dindar, M., Muukkonen, H., & Järvelä, S. (2022). The promises and challenges of artificial intelligence for teachers: A systematic review of research. TechTrends, 66, 616–630. https://doi.org/10.1007/s11528-022-00715-y

Christensen, A. A., & Jerrim, J. (2025). Professional learning communities and teacher outcomes: A cross-national analysis. Teaching and Teacher Education, 156, 104920. https://doi.org/10.1016/j.tate.2024.104920

Creswell, J. W., & Plano Clark, V. L. (2018). Designing and conducting mixed methods research (3rd ed.). SAGE Publications.

Faiz, A., Pratama, A., & Kurniawaty, I. (2022). *Pembelajaran berdiferensiasi dalam program guru penggerak pada modul 2.1* [Differentiated learning in the *Guru Penggerak* program, module 2.1]. *Jurnal Basicedu*, 6(2), 2846–2853. https://doi.org/10.31004/basicedu.v6i2.2504

Fetters, M. D., & Tajima, C. (2022). Joint displays of integrated data collection in mixed methods research. International Journal of Qualitative Methods, 21, 1–13. https://doi.org/10.1177/16094069221104564

Florian, L., & Black-Hawkins, K. (2011). Exploring inclusive pedagogy. British Educational Research Journal, 37(5), 813–828. https://doi.org/10.1080/01411926.2010.501096

Gheyssens, E., Consuegra, E., Engels, N., & Struyven, K. (2021). Creating inclusive classrooms in primary and secondary schools: From noticing to differentiated practices. Teaching and Teacher Education, 100, 103210. https://doi.org/10.1016/j.tate.2020.103210

Graham, L. J., de Bruin, K., Lassig, C., & Spandagou, I. (2021). A scoping review of 20 years of research on differentiation: Investigating conceptualisation, characteristics, and methods used. Review of Education, 9(1), 161–198. https://doi.org/10.1002/rev3.3238

Griful-Freixenet, J., Struyven, K., & Vantieghem, W. (2021). Exploring pre-service teachers' beliefs and practices about two inclusive frameworks: Universal design for learning and differentiated instruction. Teaching and Teacher Education, 107, 103503. https://doi.org/10.1016/j.tate.2021.103503

Hallinger, P., Liu, S., & Chen, L. (2025). Principal instructional leadership and teacher attitudes: A meta-analytic review, 1989–2024. European Journal of Education, 60(4), e70199. https://doi.org/10.1111/ejed.70199

Hata, A., Wang, H., Yuwono, J., & Nomura, S. (2023). Assistive technologies for children with disabilities in inclusive and special schools in Indonesia. World Bank. http://hdl.handle.net/10986/40387

Hill, N. E., & Tyson, D. F. (2009). Parental involvement in middle school: A meta-analytic assessment of the strategies that promote achievement. Developmental Psychology, 45(3), 740–763. https://doi.org/10.1037/a0015362

Holmes, W., Porayska-Pomsta, K., Holstein, K., Sutherland, E., Baker, T., Buckingham Shum, S., Santos, O. C., Rodrigo, M. T., Cukurova, M., Bittencourt, I. I., & Koedinger, K. R. (2022). Ethics of AI in education: Towards a community-wide framework. International Journal of Artificial Intelligence in Education, 32(3), 504–526. https://doi.org/10.1007/s40593-021-00239-1

Holst, J., Brock, A., Grund, J., Schlieszus, A.-K., & Singer-Brodowski, M. (2025). Whole-school sustainability at the core of quality education: Wished for by principals but requiring collective and structural action. Journal of Cleaner Production, 519, 145897. https://doi.org/10.1016/j.jclepro.2025.145897

Hong, J., Liu, W., & Zhang, Q. (2024). Closing the digital divide: The impact of teachers' ICT use on student achievement in China. Journal of Comparative Economics, 52(3), 697–713. https://doi.org/10.1016/j.jce.2024.06.003

Huijboom, F., van Meeuwen, P., Rusman, E., & Vermeulen, M. (2023). Differences and similarities in the development of professional learning communities: A cross-case longitudinal study. Learning, Culture and Social Interaction, 42, 100740. https://doi.org/10.1016/j.lcsi.2023.100740

Hwang, Y., Knobf, M. T., & Sadler, L. S. (2025). Integration in mixed-methods research with an exemplar explanatory sequential study. Nursing Research, 74(2), 144–149. https://doi.org/10.1097/NNR.0000000000000796

Jackson-Gordon, R., & Plano Clark, V. L. (2024). Using a joint display for building integration in a sequential study: Informing data collection for a participatory second phase. Journal of Mixed Methods Research, 18(2), 137–146. https://doi.org/10.1177/15586898231179848

Kahmann, R., Droop, M., & Lazonder, A. W. (2024). Dutch elementary school teachers' differentiation practices during science and technology lessons. Teaching and Teacher Education, 145, 104626. https://doi.org/10.1016/j.tate.2024.104626

Kalinowski, E., Westphal, A., Jurczok, A., & Vock, M. (2024). The essential role of teacher self-efficacy and enthusiasm for differentiated instruction. Teaching and Teacher Education, 148, 104663. https://doi.org/10.1016/j.tate.2024.104663

Kementerian Pendidikan dan Kebudayaan. (2016). *Peraturan Menteri Pendidikan dan Kebudayaan Republik Indonesia Nomor 28 Tahun 2016 tentang Sistem Penjaminan Mutu Pendidikan Dasar dan Menengah* [Regulation of the Minister of Education and Culture of the Republic of Indonesia No. 28 of 2016 on the quality assurance system for basic and secondary education].

Kementerian Pendidikan Dasar dan Menengah. (2026). *Peraturan Menteri Pendidikan Dasar dan Menengah Republik Indonesia Nomor 21 Tahun 2026 tentang Sistem Penjaminan Mutu Pendidikan* [Regulation of the Minister of Primary and Secondary Education of the Republic of Indonesia No. 21 of 2026 on the education quality assurance system] (*Berita Negara Republik Indonesia Tahun 2026 Nomor 594*).

Koivuhovi, S., Kilpi-Jakonen, E., Erola, J., & Vainikainen, M.-P. (2025). Parental involvement in elementary schools and children's academic achievement: A longitudinal analysis across educational groups in Finland. Research in Social Stratification and Mobility, 95, 101007. https://doi.org/10.1016/j.rssm.2024.101007

Kraft, M. A., Blazar, D., & Hogan, D. (2018). The effect of teacher coaching on instruction and achievement: A meta-analysis of the causal evidence. Review of Educational Research, 88(4), 547–588. https://doi.org/10.3102/0034654318759268

Kumar, A., Paliwal, J., Singh, M., Pendse, V., Gade, R., Palav, M., & Raibagkar, S. (2025). Focused literature review on accreditation and quality assurance: Insights and future research agenda. Quality Assurance in Education, 33(3), 376–392. https://doi.org/10.1108/QAE-08-2024-0170

Langelaan, B. N., Gaikhorst, L., Smets, W., & Oostdam, R. J. (2024). Differentiating instruction: Understanding the key elements for successful teacher preparation and development. Teaching and Teacher Education, 140, 104464. https://doi.org/10.1016/j.tate.2023.104464

Lewis, C., Perry, R., & Murata, A. (2006). How should research contribute to instructional improvement? The case of lesson study. Educational Researcher, 35(3), 3–14. https://doi.org/10.3102/0013189X035003003

Lindner, K.-T., & Schwab, S. (2025). Differentiation and individualisation in inclusive education: A systematic review and narrative synthesis. International Journal of Inclusive Education, 29(12), 2199–2219. https://doi.org/10.1080/13603116.2020.1813450

Liu, S., & Yin, H. (2024). Opening the black box: How professional learning communities, collective teacher efficacy, and cognitive activation affect students' mathematics achievement in schools. Teaching and Teacher Education, 139, 104443. https://doi.org/10.1016/j.tate.2023.104443

Liu, J., Aziku, M., Qiang, F., & Zhang, B. (2024). Leveraging professional learning communities in linking digital professional development and instructional integration: Evidence from 16,072 STEM teachers. International Journal of STEM Education, 11, Article 56. https://doi.org/10.1186/s40594-024-00513-

3
Mais, A., & Yaum, L. A. (2025). Innovative differentiated learning for inclusive schools: Supporting students with special needs. *Jurnal Kependidikan: Jurnal Hasil Penelitian dan Kajian Kepustakaan di Bidang Pendidikan, Pengajaran dan Pembelajaran*, 11(2), 747–758. https://doi.org/10.33394/jk.v11i2.15089
Meyer, J. W., & Rowan, B. (1977). Institutionalized organizations: Formal structure as myth and ceremony. American Journal of Sociology, 83(2), 340–363. https://doi.org/10.1086/226550
Mouta, A., Pinto-Llorente, A. M., & Torrecilla-Sánchez, E. M. (2024). Uncovering blind spots in education ethics: Insights from a systematic literature review on artificial intelligence in education. International Journal of Artificial Intelligence in Education, 34(3), 1166–1205. https://doi.org/10.1007/s40593-023-00384-9
Mumpuniarti, M., Handoyo, R. R., Phytanza, D. T., & Barotuttaqiyah, D. (2020). Teacher's pedagogy competence and challenges in implementing inclusive learning in slow learner. *Jurnal Cakrawala Pendidikan*, 39(1), 217–229. https://doi.org/10.21831/cp.v39i1.28807
Mustafa, F., Nguyen, H. T. M., & Gao, X. (2024). The challenges and solutions of technology integration in rural schools: A systematic literature review. International Journal of Educational Research, 126, 102380. https://doi.org/10.1016/j.ijer.2024.102380
Mydin, A.-A., Xia, Y., & Long, Y. (2024). Professional learning communities and their impact on teacher performance: Empirical evidence from public primary schools in Guiyang. Teaching and Teacher Education, 148, 104715. https://doi.org/10.1016/j.tate.2024.104715
Povey, J., Austerberry, S., Plage, S., Xiang, N., Bellotti, M., & Baxter, J. (2025). Adolescent mental health and parent engagement in secondary school: A systematic review of the literature. International Journal of Educational Research, 134, 102842. https://doi.org/10.1016/j.ijer.2025.102842
Pozas, M., Letzel, V., Bost, N., & Reichertz, J. (2022). Confident, positive, but interested? Exploring the role of teachers' interest in their practice of differentiated instruction. Frontiers in Education, 7, Article 964341. https://doi.org/10.3389/feduc.2022.964341
Pozas, M., Letzel, V., & Schneider, C. (2020). Teachers and differentiated instruction: Exploring differentiation practices to address student diversity. Journal of Research in Special Educational Needs, 20(3), 217–230. https://doi.org/10.1111/1471-3802.12481
Pozas, M., Letzel, V., Lindner, K.-T., & Schwab, S. (2021). DI (differentiated instruction) does matter! The effects of DI on secondary school students' well-being, social inclusion and academic self-concept. Frontiers in Education, 6, Article 729027. https://doi.org/10.3389/feduc.2021.729027
Robinson, V. M. J., Lloyd, C. A., & Rowe, K. J. (2008). The impact of leadership on student outcomes: An analysis of the differential effects of leadership types. Educational Administration Quarterly, 44(5), 635–674. https://doi.org/10.1177/0013161X08321509
Röhl, S., Bijlsma, H., & Schwichow, M. (2025). Can feedback from students to teachers improve different dimensions of teaching quality in primary and secondary education? A hierarchical meta-analysis. Educational Assessment, Evaluation and Accountability, 37, 35–71. https://doi.org/10.1007/s11092-024-09450-9
Sallis, E. (2002). Total quality management in education (3rd ed.). Routledge. https://doi.org/10.4324/9780203417010
Smale-Jacobse, A. E., Meijer, A., Helms-Lorenz, M., & Maulana, R. (2019). Differentiated instruction in secondary education: A systematic review of research evidence. Frontiers in Psychology, 10, Article 2366. https://doi.org/10.3389/fpsyg.2019.02366
Suprihatiningrum, J. (2021). Meeting the challenges of accessibility for science inclusive classrooms in Indonesian basic education system. *Al-Bidayah: Jurnal Pendidikan Dasar Islam*, 13(2). https://doi.org/10.14421/al-bidayah.v13i2.710
Suryati, L. (2023). *Penerapan program teaching factory dalam mempersiapkan kompetensi kewirausahaan siswa pada pendidikan vokasi* [Implementation of the teaching factory program in preparing students' entrepreneurial competence in vocational education]. *Jurnal Penelitian dan Pengembangan Pendidikan*, 7(1), 58–66. https://doi.org/10.23887/jppp.v7i1.58257
Tagare, D., Karki, T., & Yu, W. (2025). K–12 teachers' ethical competencies for AI literacy: Insights from a systematic literature review. Computers & Education, 239, 105435. https://doi.org/10.1016/j.compedu.2025.105435
Tobback, I., Verhaest, D., & De Witte, K. (2025). The impact of work-based versus school-based learning on

cognitive and non-cognitive outcomes in vocational secondary education. Economics of Education Review, 107, 102673. https://doi.org/10.1016/j.econedurev.2025.102673

Tomlinson, C. A. (2017). How to differentiate instruction in academically diverse classrooms (3rd ed.). ASCD.

Ula, H., & Bakar, M. Y. A. (2021). *Implementasi sistem penjaminan mutu internal (SPMI) pada masa pandemi Covid-19 di sekolah menengah pertama* [Implementation of the internal quality assurance system (SPMI) during the Covid-19 pandemic in junior high schools]. *Dirasat: Jurnal Manajemen dan Pendidikan Islam*, 7(2), 192–203. https://doi.org/10.26594/dirasat.v7i2.2623

van den Boom-Muilenburg, S. N., Poortman, C. L., Schildkamp, K., de Vries, S., & van Veen, K. (2023). Sustaining data use professional learning communities in schools: The role of leadership practices. Studies in Educational Evaluation, 78, 101273. https://doi.org/10.1016/j.stueduc.2023.101273

Weisberg, L., & Dawson, K. (2024). Picturing digital equity in the curriculum: Cultivating preservice teachers' digital equity mindsets in a technology integration course. Computers & Education, 211, 104988. https://doi.org/10.1016/j.compedu.2024.104988

Yang, L., Pang, F., & Sin, K. F. (2024). Examining the complex connections between teacher attitudes, intentions, behaviors, and competencies of SEN students in inclusive education. Teaching and Teacher Education, 144, 104595. https://doi.org/10.1016/j.tate.2024.104595

Yao, Y., Amos, M., Snider, K., & Brown, T. (2024). The impact of formative assessment on K–12 learning: A meta-analysis. Educational Research and Evaluation, 29(7–8), 452–475. https://doi.org/10.1080/13803611.2024.2363831

Younas, A., & Durante, A. (2023). Decision tree for identifying pertinent integration procedures and joint displays in mixed methods research. Journal of Advanced Nursing, 79(7), 2754–2769. https://doi.org/10.1111/jan.15536