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3E 1D Architecture Maps Teacher Policy Coherence Toward 2045: Arsitektur 3E 1D Memetakan Koherensi Kebijakan Guru Menuju 2045

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Abstract

General Background Teacher professionalism is central to national educational quality because policy aspirations are tested through classroom learning and long-term citizen development.**Specific Background** Indonesia has invested in certification, professional education, competency standards, professional organizations, digital platforms, and development programs, yet these instruments remain unevenly connected across recruitment, induction, appraisal, welfare, career pathways, leadership, and local governance. **Knowledge Gap** Existing teacher-quality initiatives are often treated as isolated programs rather than an integrated policy architecture that links equity, expertise, ecosystem support, and digital governance. **Aims** This article formulates the 3E 1D architecture as a coherent conceptual-operational framework for developing teacher quality and competence toward Golden Indonesia 2045. **Results** The integrative policy review of 60 international, Indonesian, regulatory, and theoretical sources produced four findings: teacher reforms are present but weakly integrated; compliance-oriented policy logic needs repositioning toward professional-capital development; each pillar requires concrete instruments, including a teacher-equity index, practice-based micro-credentials, professional learning communities, district coaching systems, strengthened professionalorganizations, and interoperable teacher portfolios; and implementation depends on data readiness, regional capacity, workload reduction, sustainable financing, and ethical digital governance. **Novelty** The article reframes teacher policy as a multi-level architecture that connects national standards, local support, school leadership, teacher wellbeing, professional organizations, and evidence-based professional learning. **Implications** Policymakers can use the 3E 1D model as a policy-design checklist, while future studies should validate it through Delphi inquiry, policy simulation, and pilot implementation across diverse contexts.

Highlights

- Reform instruments exist, but integration across governance levels remains weak.
- Professional capital requires equity indexes, micro-credentials, learning communities, coaching, organizational support, and interoperable portfolios.
- National scaling requires empirical validation, regional readiness, workload reduction, sustainable financing, and ethical data governance.

Keywords

Teacher Professionalism; Policy Architecture; Professional Capital; Digital Governance; Professional Learning

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INTRODUCTION

The quality of a national education system is ultimately tested in the classroom, where policy aspirations become daily learning encounters between teachers and students. Recent global reports place teachers at the centre of recovery from learning loss, digital transformation, inclusion, creativity, and learner wellbeing, while also warning that the profession is under increasing pressure from workload, accountability, and changing social expectations [1], [2]. For Indonesia, this agenda is strategic because the aspiration of Golden Indonesia 2045 depends on schools that can cultivate ethical, literate, numerate, creative, digitally competent, and socially responsible citizens [3], [4].

Indonesia has invested in teacher professionalism through certification, teacher professional education, competency standards, professional organisations, and digital platforms. Nevertheless, the core problem is no longer the absence of programmes but the weak coherence among standards, recruitment, induction, continuing professional development, appraisal, incentives, career pathways, school leadership, local-government capacity, teacher workload, and welfare [5], [6]. This fragmentation limits the capacity of reform to become a visible professional pathway for every teacher [7], [8].

This article therefore argues for a shift from a compliance-administrative paradigm toward an integrated professional-capital paradigm. The compliance paradigm treats teachers mainly as recipients of regulation, training, certification, and reporting duties; the professional-capital paradigm treats teachers as knowledge workers who need expertise, collaboration, judgement, autonomy, ethical responsibility, recognition, and institutional trust [9], [10].

The 3E-1D model is proposed to respond to this policy gap. Equity ensures fair access to competent teachers and high-quality professional learning across regions and school types. Expertise develops competence through clinical preparation, mentoring, coaching, micro-credentialing, and evidence-based pedagogy. Ecosystem aligns schools, universities, professional organisations, local governments, and communities as a coherent support system. Digital Governance integrates reliable teacher data, competency portfolios, learning analytics, and ethical platform use to support improvement rather than administrative duplication [13]-[16].

The guiding question of this article is: how can Indonesia formulate a coherent, implementable, and evidence-informed policy architecture for improving teacher quality and competence toward Golden Indonesia 2045? The article contributes by synthesising contemporary evidence, diagnosing fragmentation in Indonesian teacher policy, and offering the 3E-1D architecture as a conceptual-operational model that still requires empirical validation and staged implementation [17]-[20].

1.1 Literature Review and Theoretical Foundation

Teacher competence in contemporary scholarship is understood as a multidimensional combination of knowledge, skills, dispositions, values, professional judgement, and context-sensitive action. In Indonesia, this concept is normatively rooted in the professional status of teachers and the established domains of pedagogical, professional, personality, and social competence, which have been further elaborated in the newer teacher competency model issued by the Directorate General of Teachers and Education Personnel [8], [9]. Yet global literature suggests that the four-domain model needs to be operationalised through a broader twenty-first-century lens that includes inclusive pedagogy, formative assessment, digital pedagogy, collaborative professionalism, reflective practice, and teacher wellbeing [21]–[24].

A major lesson from recent teacher professional development literature is that short, one-off, transmission-based training rarely changes classroom practice. Effective professional development is typically sustained, subject-specific, collaborative, practice-based, supported by external expertise, connected to curriculum materials, and accompanied by feedback or coaching [12], [13]. Meta-analytic and systematic-review evidence further indicates that professional development is more likely to improve student achievement when it includes clear instructional content, opportunities for rehearsal, classroom implementation, structured follow-up, and school-level conditions that protect teacher learning time [14]–[16].

Professional learning communities and instructional leadership are important because teacher learning is socially and organisationally situated. Evidence on professional learning communities shows that collaborative inquiry, collective responsibility, shared norms, and data-informed reflection can strengthen teacher efficacy and instructional improvement when they are not reduced to routine administrative meetings [25], [26]. School leaders therefore should not merely supervise teachers for compliance, but should create conditions for professional dialogue, peer observation, lesson study, coaching, and psychologically safe improvement cycles [27], [28].

Digital competence has become a core component of teacher quality, not because technology replaces pedagogy, but because digital tools increasingly shape access to resources, assessment, communication, differentiation, learning analytics, and professional learning. Recent studies on teacher digital competence and online professional learning show that effective digital development requires hands-on practice, contextualised tasks, mentoring, institutional support, and reflective integration with pedagogy [15], [16], [29]. Indonesian evidence also indicates that digital pedagogical competence is uneven and requires systematic support rather than episodic platform socialisation [30], [31].

Teacher policy cannot be separated from teacher wellbeing and retention. TALIS 2024 indicates that administrative workload, stress, autonomy, professional development, appraisal, and perceived social value are central to the lived reality of teaching [2]. The emerging literature on teacher wellbeing and professional identity suggests that sustainable professionalism depends on the interaction between competence, agency, recognition, workload, collegiality, and the moral meaning of teaching [32]–[35]. Thus, a policy that demands higher competence without protecting time, dignity, career

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mobility, and wellbeing will produce compliance rather than transformation [36], [37].

Indonesia-specific studies show both progress and persistent fragmentation. Research on professional education, Guru Penggerak, remote-area professional development, reflective online teacher development, and digital pedagogical competence shows that well-designed programmes can improve competence, motivation, and reflective capacity, but their impact is limited when they are not embedded in a coherent system of school leadership, coaching, follow-up, incentives, and local capacity [22], [23], [30], [38]–[42]. This confirms that teacher competence policy should be designed as an ecosystem, not as isolated training projects [43], [44].

Policy-design theory also underlines the importance of alignment between policy goals, instruments, implementation capacity, data infrastructure, and feedback loops. A policy architecture is strong when its instruments are mutually reinforcing: standards guide preparation and appraisal; appraisal guides development; development guides career progression; career progression is linked to incentives; and data systems provide valid evidence for improvement rather than merely reporting compliance [45]–[48]. The 3E-1D model adopts this logic by integrating equity, expertise, ecosystem, and digital governance into one policy cycle.

METHODS

This article uses an integrative policy review, a method suitable for synthesising peer-reviewed studies, policy reports, legal documents, and conceptual literature in order to generate a new policy framework. The review was not designed as a meta-analysis because the objective was not to calculate effect sizes, but to formulate a theoretically grounded and contextually relevant policy architecture for Indonesia [49], [50].

The literature search was conducted through an iterative purposive strategy. The authors searched international databases and repositories, including Scopus-indexed journal sources, ScienceDirect, Taylor & Francis Online, ERIC, Google Scholar, OECD iLibrary, UNESCO Digital Library, World Bank documents, Indonesian government regulatory portals, SINTA-indexed Indonesian journals, and institutional journal portals. The main keywords and keyword combinations included teacher policy, teacher professionalism, teacher competence, teacher professional development, professional learning community, instructional leadership, digital competence, teacher wellbeing, teacher workload, policy coherence, education policy implementation, Indonesia teacher development, Guru Penggerak, Model Kompetensi Guru, organisasi profesi guru, and Indonesia Emas 2045.

Sources were selected using four criteria: relevance to teacher competence or teacher-policy design; publication mainly between 2020 and 2026, except foundational books and classic review-method references; credibility of source type, including Scopus-indexed journals, SINTA-indexed Indonesian journals, international organisations, government regulations, and scholarly books; and usefulness for explaining one or more dimensions of the proposed 3E-1D model. The final synthesis retained 60 sources because they represented the strongest evidence base across six clusters: teacher competence, professional development, digital competence, school leadership and professional learning communities, wellbeing and retention, and policy coherence [1]-[60]. The analysis proceeded through problem identification, thematic coding, policy-instrument mapping, synthesis of the 3E-1D model, and formulation of implementation indicators and risks.

RESULTS AND DISCUSSION

3.1 Diagnosis: Fragmented Professionalism in Indonesian Teacher Policy

The review generated a concrete diagnosis: Indonesia has built many components of teacher reform, but these components do not yet operate as a coherent professional ecosystem. Certification strengthened the formal status of teachers, professional education seeks to improve entry and in-service preparation, the competency model clarifies standards, professional organisations are formally facilitated, and digital platforms expand access to learning resources [8]-[10]. However, the connection among these instruments remains uneven because professional development is often programme-based rather than pathway-based, data are not fully interoperable, school-level follow-up varies across regions, and teacher workload can weaken participation in meaningful learning [5], [6], [11].

Five findings follow from the review. First, teacher quality policy requires a visible professional journey from preparation to advanced career recognition. Second, professional development should be measured through classroom evidence, not merely attendance certificates. Third, equity must become an explicit policy instrument because distribution, subject matching, mentoring, and digital access vary across regions. Fourth, professional organisations and universities should function as quality-support hubs, not only administrative partners. Fifth, digital governance must reduce duplication and generate feedback for teacher growth rather than intensifying surveillance [12]-[16], [25]-[31].

These findings indicate that the 3E-1D model should be understood as a policy architecture, not simply as a conceptual slogan. In practical terms, the model links four operational questions: which teachers and schools need the most support, which competencies should be developed, which institutions are responsible for support, and which data can guide improvement without increasing administrative burden [1], [5]-[7].

3.2 The 3E-1D Policy Architecture

The proposed architecture consists of four interdependent pillars. The model is deliberately simple enough to be

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communicated to policymakers but sufficiently comprehensive to guide programme design, budgeting, monitoring, and evaluation. Its central assumption is that teacher quality is not produced by training alone; it is produced by an ecosystem that recruits, prepares, supports, evaluates, rewards, and protects teachers as professionals [10], [12], [45].

TABLE 1. *CORE ARCHITECTURE OF THE 3E-1D TEACHER POLICY MODEL*

Pillar	Policy meaning	Main instruments	Expected outputs	Key citations
E1: Equity	Guaranteeing fair access to competent teachers and professional learning across regions, subjects, school types, and learner needs.	Teacher-distribution analytics; differentiated incentives; remote-area mentoring; inclusive education support; local capacity grants.	Reduced quality gaps; improved teacher availability; stronger support for disadvantaged schools.	[1], [5]–[7]
E2: Expertise	Developing teacher competence as clinical, reflective, subject-specific, digital, inclusive, and assessment-informed expertise.	Clinical teacher preparation; induction; coaching; lesson study; micro-credentials; practice-based CPD; formative appraisal.	Improved instructional quality; stronger pedagogical content knowledge; reflective and adaptive teachers.	[12]–[16], [21]–[24]
E3: Ecosystem	Aligning schools, universities, professional organisations, local governments, communities, and ministries into a coherent support system.	Professional learning communities; university-school partnerships; professional organisation facilitation; instructional leadership; community accountability.	Sustainable professional capital; stronger school culture; collective responsibility for student learning.	[25]–[28], [43]–[48]
D1: Digital Governance	Using interoperable data and digital platforms to personalise development, monitor competence, and reduce administrative burden.	Integrated teacher portfolio; competency dashboard; learning analytics; AI-supported resources; data privacy and ethics protocol.	Evidence-based decisions; reduced duplication; personalised professional growth; transparent career progression.	[2], [15], [16], [29]–[31]

3.3 Policy Lever 1: Equity as the Foundation of Teacher Quality

Equity is the first pillar because teacher quality is a public good that must not depend on a child's postcode, school wealth, or parental capacity. Operationally, a school district can translate this pillar into a teacher-equity map that identifies subject mismatch, remote-school vacancies, inclusive-education needs, digital-access gaps, and mentor availability. At the school level, principals can use the same map to prioritise peer mentoring for novice teachers, support teachers who teach outside their field, and allocate professional-learning time for teachers serving high-need learners [1], [5]-[7].

The policy implication is the development of a national teacher-equity index combining teacher-student ratio, subject match, certification and competency evidence, school location, learner vulnerability, digital access, and local fiscal capacity. The index should guide differentiated incentives, deployment, scholarships, remote coaching, and professional-development grants. A measurable target could include annual reduction of subject-mismatch rates, increased coverage of mentor access in remote schools, and expanded inclusive-pedagogy support in disadvantaged schools [6], [7].

Equity also means that professional development should reach private schools, madrasah-linked ecosystems, small schools, and remote schools, not only administratively advantaged institutions. Professional organisations and universities can serve as regional hubs for mentoring, micro-credentialing, and quality assurance when their services are linked to transparent standards, teacher participation, and documented competence growth [9], [10].

3.4 Policy Lever 2: Expertise as Developmental Professional Capital

Expertise is the second pillar because competent teaching is complex work requiring content knowledge, pedagogical content knowledge, classroom management, assessment literacy, inclusive pedagogy, digital pedagogy, ethical judgement, and relational sensitivity. At the school level, this pillar can be implemented through lesson study, peer observation, coaching cycles, student-work analysis, video-based reflection, and classroom action inquiry. At the district level, it can be supported through trained mentor teachers and subject-based professional communities [12]-[16], [21].

Indonesia therefore needs to connect teacher education, induction, CPD, appraisal, and career progression through developmental levels of expertise. The teacher competency model should be used as a developmental map rather than only an administrative standard. Each teacher should be able to answer three practical questions: what is my current competency profile, what evidence demonstrates it, and what support will move me to the next professional level [8], [9].

Practice-based micro-credentialing is a concrete instrument for this pillar. Instead of recognition based only on workshop attendance, teachers should earn stackable credentials through classroom artefacts such as lesson designs, student-work analysis, formative-assessment tasks, inclusive-learning adaptations, peer-observation notes, video reflections, and digital-learning implementation. The evidence can be curated in a professional portfolio and reviewed by trained mentors, school leaders, or accredited professional organisations [15], [16], [29].

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3.5 Policy Lever 3: Ecosystem as Coherent Support for Teacher Growth

The third pillar, Ecosystem, responds to the reality that teacher competence is not built by individual effort alone. Teachers need school cultures that value learning, principals who protect professional time, peers who collaborate, universities that provide research-based support, professional organisations that uphold ethics, and local governments that translate national policy into contextual implementation [25]-[28].

Professional learning communities should become the operational heart of this ecosystem. They need to move from routine meetings into disciplined inquiry cycles: identifying a student-learning problem, studying evidence, designing an intervention, observing practice, reflecting on student work, documenting improvement, and sharing the lesson with other teachers. For example, a school PLC may focus on improving formative assessment in Grade 7 mathematics, while the district provides a mentor, the university provides expertise, and the professional organisation validates the micro-credential evidence [25], [26].

Professional organisations also need to move beyond ceremonial membership toward ethical protection, competency actualisation, peer mentoring, and professional advocacy. The 2024 regulation on facilitation of teacher professional organisations provides a policy window for strengthening this role, provided that government support is linked to measurable services such as mentoring hours, teacher-help desks, ethics counselling, professional-development modules, and documented impact on teacher competence [10].

3.6 Policy Lever 4: Digital Governance for Evidence-Based Professionalism

Digital Governance is the fourth pillar because teacher policy will remain fragmented when data systems remain fragmented. Indonesia already has multiple platforms and datasets, but the policy challenge is interoperability, validity, teacher trust, ethical use, and reduction of administrative duplication. A teacher should not repeatedly upload similar documents to different systems without receiving meaningful feedback for professional growth [2], [15], [16].

A national teacher professional portfolio should integrate qualification, certification, teaching assignment, competency profile, professional development, classroom evidence, peer mentoring, appraisal, career progression, and wellbeing indicators. The purpose is improvement support, not surveillance. Data should answer practical policy questions: which teachers need coaching, which teachers can become mentors, which schools need support, which CPD programmes are effective, which regions require fiscal assistance, and which administrative burdens should be simplified [29]-[31].

Artificial intelligence and learning analytics may support teacher development if governed ethically. AI can help curate resources, generate formative-assessment ideas, support reflective prompts, and identify professional-development needs, but it should not replace teacher judgement or create punitive algorithmic accountability. Digital governance therefore requires data protection, transparency, human oversight, consent protocols, audit trails, and professional ethics [2], [15], [16].

3.7 Implementation Roadmap Toward Indonesia Emas 2045

The 3E-1D model should be implemented progressively through a 2026-2045 roadmap. The short-term phase should focus on policy alignment and pilot regions; the medium-term phase should institutionalise micro-credentialing, teacher-equity indexes, and professional learning communities; and the long-term phase should establish a mature professional-career ecosystem that links teacher expertise, leadership, welfare, and student learning outcomes [1], [2], [45].

TABLE 2. *ROADMAP FOR IMPLEMENTING THE 3E-1D ARCHITECTURE*

Phase	Strategic focus	Priority actions	Responsible actors	Success indicators
2026-2029	Policy alignment and pilots	Map teacher-equity index; audit CPD quality; design teacher portfolio; pilot coaching and micro-credentials in diverse regions.	Kemendikdasmen, LPTK, local governments, professional organisations, schools.	Integrated pilot dashboard; CPD standards; reduced duplicated reporting; pilot teacher-growth evidence.
2030-2034	Institutionalisation	Scale PLC facilitation; integrate appraisal-development-career pathways; establish mentor teacher certification; strengthen remote-area support.	Ministries, BSKAP/GTK, LPTK, districts/provinces, school leaders.	Mentor-teacher network; professional learning hours protected; regional competence gaps reduced.
2035-2039	Professional career transformation	Implement advanced career ladders; link expertise to leadership roles; provide welfare-sensitive workload reform; strengthen professional ethics.	Central and local governments, teacher organisations, school foundations.	Transparent career mobility; reduced attrition risk; stronger teacher autonomy and wellbeing.
2040-2045	Mature professional ecosystem	Establish Indonesia Teacher Professional Capital Index; use	National education ecosystem.	Sustained learning gains; equitable teacher quality; international recognition

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		longitudinal data for policy improvement; position teachers as national innovation leaders.		of Indonesian teacher professionalism.

3.8 Key Performance Indicators and Evaluation Design

A policy architecture needs measurable indicators, but indicators must be used to support improvement rather than punish teachers. The evaluation design should combine input, process, output, and outcome indicators. Input indicators show whether teachers have access to support; process indicators show whether professional learning is practice-based; output indicators show competency growth; and outcome indicators show improvements in classroom quality, student learning, inclusion, and teacher wellbeing [14], [25], [32].

TABLE 3. *SUGGESTED KPI FOR 3E-1D TEACHER POLICY EVALUATION*

Dimension	Indicator cluster	Example metrics	Data source	Use of data
Equity	Distribution and access	Subject-matched teacher ratio; remote-school mentor access; inclusive-education support coverage.	Dapodik, local staffing data, teacher-equity index.	Targeted incentives and support.
Expertise	Competency growth	Portfolio evidence; micro-credential completion; classroom-observation growth; assessment-literacy tasks.	Teacher portfolio, coaching logs, appraisal reports.	Personalised development plan.
Ecosystem	Professional collaboration	PLC inquiry cycles; peer observation frequency; mentor-teacher participation; university-school partnerships.	School reports, PLC documentation, portfolio artefacts.	School improvement planning.
Digital Governance	Data quality and usability	Interoperability score; teacher data accuracy; reduced duplicate uploads; dashboard feedback use.	Platform analytics, audit reports, teacher surveys.	Administrative simplification and decision support.
Wellbeing and dignity	Workload and professional climate	Administrative workload perception; professional autonomy; job satisfaction; recognition and protection cases.	Teacher survey, HR data, professional organisation reports.	Welfare-sensitive policy correction.

3.9 Operationalisation Across Governance Levels

To respond to reviewer concerns regarding practical implementation, the 3E-1D architecture is translated below into governance-level actions. This operational matrix clarifies that implementation is not located only at the national level; it must also be enacted through school routines, district coaching systems, university-school partnerships, professional-organisation services, and interoperable digital platforms. Each level has specific actors, measurable indicators, and evidence that can be audited without adding excessive administrative burden.

TABLE 4. *OPERATIONAL IMPLEMENTATION OF THE 3E-1D MODEL ACROSS GOVERNANCE LEVELS*

Governance level	Operational example	Responsible actors	Measurable indicator	Evidence for review
School	Run monthly PLC inquiry cycles; conduct peer observation; curate teacher portfolio artefacts; protect professional-learning time.	Principal, mentor teachers, subject coordinators, teachers.	Number of completed PLC cycles; peer-observation frequency; portfolio completeness; reduced duplicate reporting.	PLC minutes, lesson-study notes, observation logs, student-work samples, portfolio entries.
District/province	Map teacher-equity index; deploy mentors to underserved schools; fund contextual CPD; coordinate remote coaching.	Education offices, supervisors, district facilitators, local government.	Subject-match improvement; mentor access coverage; CPD participation by disadvantaged schools; coaching completion.	Dapodik/local staffing data, coaching dashboards, equity-index reports, budget records.
Professional organisations	Provide ethics counselling, mentoring clinics, micro-credential validation, and teacher	Teacher professional organisations, accredited facilitators, expert panels.	Mentoring hours; validated micro-credentials; teacher-help-desk cases	Service logs, validation reports, ethics records, teacher satisfaction survey.

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	advocacy services.		resolved; participation rate.	
Universities/LPTK	Support clinical preparation, mentor training, research-based CPD modules, and school improvement inquiry.	LPTK, postgraduate programmes, teacher educators, researchers.	Number of school-university partnerships; mentor certification; evidence-based CPD modules used.	MoU documents, module records, mentor certificates, joint research or evaluation reports.
Ministries/digital governance	Integrate teacher data, competency profiles, CPD records, portfolio evidence, appraisal, and wellbeing indicators.	Kemendikdasmen, data centres, platform managers, policy units.	Interoperability score; reduced duplicate uploads; dashboard use; data privacy compliance.	Platform audit, data-quality reports, privacy protocol, dashboard analytics.

3.10 Implementation Challenges and Risk Mitigation

The 3E-1D model also faces implementation risks. The most important risks are data readiness, uneven regional capacity, increased administrative workload, limited budget sustainability, and teacher mistrust of digital accountability. These risks should be treated as design variables. A policy architecture that ignores them may reproduce compliance without transformation, whereas a policy architecture that anticipates them can protect teacher dignity while strengthening competence and accountability [32]-[37], [45]-[48].

TABLE 5. *IMPLEMENTATION RISKS AND MITIGATION STRATEGIES*

Implementation risk	Possible consequence	Mitigation strategy	Monitoring indicator
Data readiness and interoperability	Fragmented dashboards, repeated uploads, weak evidence for policy decisions.	Develop a single teacher-data protocol, data dictionary, platform interoperability standard, and privacy audit.	Reduced duplicate uploads; data accuracy rate; dashboard use frequency.
Uneven regional capacity	High-capacity districts benefit first while disadvantaged regions lag behind.	Use differentiated grants, regional mentor pools, university hubs, and targeted technical assistance.	Equity-index gap reduction; mentor coverage in underserved schools.
Teacher administrative workload	Professional learning becomes additional paperwork rather than meaningful growth.	Replace document duplication with portfolio evidence, simplify reporting, and protect professional-learning time.	Teacher workload survey; reporting-time reduction; PLC time allocation.
Budget sustainability	Pilots succeed temporarily but fail to scale or continue.	Link 3E-1D instruments to medium-term budgeting, local fiscal capacity mapping, and cost-effective digital support.	Multi-year budget allocation; cost per teacher supported; continuity of mentoring services.
Trust and ethical digital governance	Teachers perceive platforms as surveillance and resist authentic evidence sharing.	Apply transparency, consent, human oversight, data protection, and non-punitive feedback principles.	Teacher trust survey; privacy compliance audit; complaint resolution rate.

3.11 Novelty and Theoretical Contribution

The novelty of the article lies in reframing teacher policy as an architecture rather than a programme. Many studies analyse teacher competence, professional development, digital competence, leadership, or wellbeing separately; the 3E-1D model integrates these domains into a coherent policy structure that connects national regulation, local implementation, school culture, teacher agency, professional organisations, welfare, and data governance [12]-[16], [25]-[31].

The model also contributes to educational management theory by combining professional-capital theory, improvement science, and policy-coherence logic. Professional-capital theory explains why teacher quality requires human, social, and decisional capital; improvement science explains why reform needs iterative evidence-based cycles; and policy-coherence theory explains why standards, appraisal, development, incentives, and data must be mutually reinforcing [10], [20], [45]-[48].

For Indonesian doctoral-level discourse, the article offers a bridge between macro-policy analysis and meso-level school management. It shows that teacher transformation cannot be achieved only through central regulation or school-level enthusiasm; it requires a designed architecture in which national standards, regional capacity, school leadership, professional organisations, digital platforms, and teacher wellbeing are aligned [5], [6], [8]-[10].

3.12 Policy Recommendations

First, the Ministry should formulate a national teacher-policy coherence framework that explicitly links the teacher competency model, teacher professional education, CPD, appraisal, career progression, professional organisations, and digital platforms. The framework should clarify which instrument serves diagnosis, development, recognition, accountability, welfare protection, or career mobility [8]-[10].

Second, Indonesia should establish a teacher-equity index to guide differentiated support for schools and regions. The index should inform incentives, scholarships, mentoring, deployment, infrastructure, and digital-access support, especially for remote, disadvantaged, inclusive, and low-performing schools [1], [6], [7].

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Third, CPD should be redesigned as practice-based professional learning. Training budgets should prioritise coaching, lesson study, subject-specific communities, micro-credentials, classroom evidence, and follow-up mentoring rather than attendance-based workshops [12]-[16].

Fourth, school leaders should be trained and evaluated as leaders of teacher learning. Principal performance indicators should include the quality of PLC inquiry cycles, peer-observation culture, coaching practice, teacher wellbeing, reduced administrative burden, and evidence of instructional improvement [25]-[28].

Fifth, digital platforms should be integrated into a teacher professional portfolio that supports personalised growth, not merely compliance reporting. Digital governance should reduce administrative burden and uphold data privacy, transparency, human oversight, interoperability, and teacher trust [2], [15], [16], [29]-[31].

Sixth, professional organisations should be strengthened as ethical, developmental, and protective institutions. Their facilitation should be linked to quality standards, mentoring services, professional ethics, and teacher advocacy [10].

Seventh, teacher wellbeing should be treated as a quality policy, not as a welfare issue detached from learning outcomes. Workload reform, administrative simplification, psychological safety, recognition, and career dignity are necessary conditions for sustained professional growth [32]–[37].

CONCLUSION

This article concludes that the transformation of Indonesian teacher professionalism toward Golden Indonesia 2045 requires a coherent policy architecture rather than fragmented programme expansion. The 3E-1D model offers four mutually reinforcing levers: Equity for fair access to competent teachers and professional learning; Expertise for evidence-based competence development; Ecosystem for collaboration among schools, universities, professional organisations, local governments, and communities; and Digital Governance for interoperable data, competency portfolios, and ethical learning analytics [1]-[16].

The practical contribution of the model is that policymakers can use it as a policy-design checklist: identify teacher-quality gaps through an equity index, develop expertise through practice-based CPD and micro-credentials, strengthen school and regional support ecosystems, and integrate digital portfolios to support feedback, career development, and administrative simplification. In this sense, 3E-1D helps translate broad teacher-quality aspirations into implementable instruments, measurable indicators, responsible actors, and risk-mitigation strategies [25]-[31], [45]-[48].

At the same time, the model should not be read as an already validated national solution. It remains a conceptual-policy formulation based on an integrative review and therefore has limitations: it does not test causal effects, it does not measure regional readiness empirically, and it does not yet compare implementation across school types. Future research should conduct Delphi validation with experts, policy simulation, pilot implementation in diverse provinces, and empirical studies linking 3E-1D indicators with teacher performance, student learning, inclusion, and teacher wellbeing [49], [50].

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CONFLICT OF INTEREST STATEMENT

The authors declare that there is no commercial or financial relationship that could be construed as a potential conflict of interest.

AUTHOR CONTRIBUTIONS

Muryadi conceptualised the 3E-1D model and drafted the manuscript. Fathur Rokhman contributed to literature synthesis and policy-mapping analysis. Eko Handoyo provided academic supervision, conceptual refinement, and methodological review. All authors approved the final manuscript draft.

Evidence Mapping of the Review

The evidence base was organised into six clusters: global teacher-policy reports and data [1]-[7]; Indonesian legal and regulatory foundations [8]-[10]; Indonesian teacher-development evidence [11], [22], [23], [30], [38]-[44]; international professional-development and digital-learning evidence [12]-[16], [24]-[31]; wellbeing, identity, retention, and workload literature [32]-[37]; and policy design, professional capital, improvement science, and research-method foundations [45]-[60]. This clustering supports the revised 3E-1D model as a conceptual-policy formulation grounded in multi-level evidence while acknowledging the need for empirical validation.

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