Implementing Digital Education Policy through e-Rapor in Rural Indonesian High Schools: A Case Study of SMAN 1 Abung Tinggi

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Article Info :	Abstract
	This study examines the implementation of Indonesia's digital education policy through the e-Rapor system in a rural public high school, SMAN 1 Abung Tinggi, using a qualitative descriptive case study approach. Drawing on in-depth interviews, non-participant observations, and document analysis, the research analyzes e-Rapor as a socio-technical instrument embedded in organizational routines rather than as a standalone technological application. The findings show that e-Rapor improves administrative efficiency, data integration, and reporting accountability, while simultaneously reshaping assessment practices, professional roles, and internal coordination mechanisms. Implementation outcomes are strongly mediated by human resource capacity, leadership practices, infrastructural constraints, and informal adaptive arrangements developed at the school level. Digital literacy gaps and unstable connectivity remain persistent challenges, yet peer collaboration and managerial support enable functional policy adaptation. The study demonstrates that digital policy effectiveness in rural contexts emerges from institutional mediation and organizational learning, not from technological deployment alone. Theoretically, the research contributes to policy implementation and digital governance by highlighting adaptive compliance, while methodologically it demonstrates qualitative inquiry for capturing contextualized dynamics.

INTRODUCTION

The rapid diffusion of digital governance in education has reconfigured how states operationalize accountability, assessment, and learning management within increasingly data-driven policy environments, particularly as digital platforms are positioned as instruments to standardize educational quality while enhancing system responsiveness across diverse territorial contexts (Fayzullayevna, 2024; Wijaya & Badrujaman, 2025). Globally, digital assessment systems are no longer treated as auxiliary technologies but as infrastructural components of education policy implementation that mediate interactions among curriculum standards, administrative control, and classroom practices. In developing and middle-income countries, this shift intersects with long-standing structural disparities between urban and rural schools, where infrastructural limitations, uneven human capital, and bureaucratic fragmentation complicate the translation of national digital education policies into effective local practice (Grindle, 1980). Indonesia's adoption of digital assessment tools, including the e-Rapor system mandated for secondary education, reflects this global trajectory while simultaneously exposing the tension between centralized digital reform agendas and heterogeneous local implementation capacities (Hartati & Waskito, 2024).

Existing empirical studies on digital assessment in Indonesian secondary education largely converge on the proposition that e-Rapor enhances efficiency, transparency, and accuracy in documenting student learning outcomes, particularly by reducing manual administrative burdens and aligning assessment practices with competency-based standards (Dewi & Sukiman, 2021; Putri & Firmansyah, 2023). These studies also indicate that digital assessment platforms function as governance tools that extend state oversight into pedagogical routines, reinforcing compliance with national evaluation frameworks while reshaping teacher work patterns. At the same time, comparative and conceptual scholarship emphasizes that the success of such systems cannot be reduced to technological adequacy alone, as implementation outcomes are strongly mediated by organizational readiness,

professional motivation, and alignment between policy design and operational realities (Tummers, Steijn, & Bekkers, 2012; Hazlett, McAdam, & Walker, 2013). Read together, this literature suggests that digital assessment reforms operate at the intersection of technology, policy, and professional agency, producing outcomes that vary substantially across institutional settings.

Despite this growing body of work, several conceptual and empirical limitations remain evident. First, much of the Indonesian literature privileges effectiveness outcomes while under-theorizing the implementation process itself, often treating schools as passive recipients of centrally designed digital systems rather than as complex organizations negotiating policy demands under resource constraints (Hartati & Waskito, 2024; Zamili, 2021). Second, existing studies tend to focus on urban or relatively well-resourced schools, leaving rural high schools underrepresented in analyses of digital policy enactment, even though these contexts are more likely to experience infrastructural fragility and professional capacity gaps (Putri & Firmansyah, 2023). Third, inconsistencies emerge between normative claims that digitalization democratizes assessment practices and empirical indications that it may reproduce or even intensify administrative asymmetries when local implementation conditions are insufficiently examined (Dewi & Sukiman, 2021). These gaps point to the need for research designs that foreground context-sensitive implementation dynamics rather than assuming linear policy effects.

The unresolved issues surrounding digital assessment implementation carry both scientific and practical significance. From a policy implementation perspective, neglecting contextual variation risks misattributing implementation failures to individual resistance or technical shortcomings, while obscuring structural and organizational determinants that shape professional willingness and capacity to enact policy mandates (Tummers et al., 2012; Grindle, 1980). From an educational management standpoint, limited understanding of how digital systems are operationalized at the school level undermines efforts to align policy objectives with operational processes, potentially weakening the integrative role of digital tools in improving assessment governance (Hazlett et al., 2013). In rural Indonesian settings, where schools often function at the margins of infrastructural development, these blind spots become particularly consequential, as policy instruments such as e-Rapor may simultaneously promise standardization and generate new layers of administrative vulnerability (Zamili, 2021).

Within this landscape, the present study positions itself at the intersection of digital education policy, public-sector implementation theory, and educational operations management by examining e-Rapor not merely as a technological artifact but as an implementation mechanism embedded within specific organizational and territorial conditions. Building on insights from digital transformation frameworks and policy implementation scholarship, this research treats rural high schools as active sites of policy translation, where professional agency, institutional capacity, and infrastructural constraints interact to shape actual policy outcomes (Wijaya & Badrujaman, 2025; Tummers et al., 2012). By focusing on SMAN 1 Abung Tinggi as a case study, the research advances a contextually grounded understanding of how national digital assessment policies are enacted at the periphery of the education system, thereby extending empirical inquiry beyond dominant urban-centric narratives (Hartati & Waskito, 2024).

This study aims to analyze how the digital education policy embodied in the e-Rapor system is implemented in a rural Indonesian public high school, with particular attention to organizational processes, professional practices, and contextual constraints that mediate policy realization. The research contributes theoretically by integrating public policy implementation perspectives with digital education governance, offering a nuanced account of how technology-driven reforms are negotiated within local institutional settings. Methodologically, it demonstrates the value of in-depth case study approaches for capturing implementation dynamics that are often obscured in large-scale evaluations, thereby enriching the analytical toolkit available for assessing digital transformation in education systems.

RESEARCH METHOD

This study adopts a qualitative, non-experimental empirical approach using a descriptive case study design to examine the implementation of a national digital education policy through the e-Rapor system at SMAN 1 Abung Tinggi, a rural public high school in North Lampung Regency. The research does not involve experimental manipulation, system prototyping, or performance benchmarking in the engineering sense; instead, it investigates an already-deployed digital assessment system as a socio-

technical artifact embedded in an operational educational environment. The empirical focus is placed on the organizational architecture of e-Rapor implementation, encompassing the interaction between the centrally designed e-Rapor platform, school-level administrative structures, available information and communication technology infrastructure, and human resources acting as system operators and end users. Data were collected through in-depth semi-structured interviews with key actors directly involved in system operation, non-participant observations of routine assessment and administrative processes, and analysis of technical guidelines, policy documents, and institutional records related to e-Rapor usage. These stages collectively capture how the digital system is configured, accessed, and operationalized within the constraints of a rural educational setting.

The validation of findings follows qualitative empirical standards rather than quantitative performance testing or algorithmic evaluation. Data analysis was conducted using an interactive analytical model involving systematic data reduction, thematic organization, and iterative interpretation to identify patterns related to implementation effectiveness, operational bottlenecks, and contextual enablers or constraints. Credibility and reliability were ensured through methodological triangulation, integrating interview data, observational evidence, and documentary analysis to cross-verify empirical insights. Source triangulation across multiple stakeholder roles further strengthened internal validity by mitigating single-perspective bias. As this study evaluates policy implementation outcomes rather than system efficiency metrics such as processing speed or computational accuracy, the primary evaluative criteria consist of consistency between policy design and operational practice, usability perceptions among implementers, and institutional capacity to sustain digital assessment processes. Ethical safeguards were maintained throughout the research process by securing informed consent, ensuring confidentiality, and restricting data use to academic analysis.

RESULTS AND DISCUSSION
Implementation Dynamics of the e-Rapor Policy at SMAN 1 Abung Tinggi

The empirical findings indicate that the implementation of the e-Rapor policy at SMAN 1 Abung Tinggi represents a concrete manifestation of Indonesia's broader agenda for educational digital transformation, where digital systems function as governance instruments rather than merely administrative tools. Interview data reveal that school actors interpret e-Rapor as an extension of state oversight embedded within everyday assessment practices, aligning local routines with nationally standardized data structures. This perception resonates with the argument that digitalization restructures organizational processes and decision-making logics by privileging data integration and traceability (UNESCO, 2021; Wijaya & Badrujaman, 2025). Observational evidence further demonstrates that assessment activities are increasingly organized around system logics, shaping timelines, coordination patterns, and reporting responsibilities. These dynamics confirm that e-Rapor operates as a socio-technical system whose effects extend beyond technical efficiency into institutional behavior and professional practice.

From an operational standpoint, the findings show that the architectural configuration of e-Rapor implementation relies on a centralized digital platform interfacing with school-level administrative hierarchies and human resources. The system is accessed through school-owned computers connected to the national DAPODIK database, with designated operators mediating between teachers and the platform. This configuration positions operators as critical intermediaries, a role that emerges not from formal policy design but from local adaptation to differential digital competencies among staff. Such an arrangement reflects broader observations that policy instruments are often reconfigured at the implementation stage to accommodate organizational realities (Greenberg et al., 1977; Hazlett et al., 2013). Consequently, the technical architecture cannot be analytically separated from the social organization that sustains its daily operation.

Empirical interview narratives suggest that teachers' engagement with e-Rapor varies significantly across age groups and prior exposure to digital technologies. Younger teachers tend to interact directly with the system, perceiving it as consistent with competency-based assessment paradigms emphasized in contemporary education reform (Zamili, 2021). Senior teachers, by contrast, often rely on operators for data entry, citing concerns related to usability and perceived complexity. This pattern aligns with diffusion of innovation theory, which emphasizes heterogeneity in adoption rates based on perceived relative advantage and compatibility with existing practices (Lee, 2024). The

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differentiated engagement observed at SMAN 1 Abung Tinggi illustrates how digital policy implementation unfolds unevenly within a single institution.

The observational data further indicate that coordination mechanisms surrounding e-Rapor have evolved into informal yet stable routines. Teachers commonly submit assessment data in semi-processed formats, which are then standardized and uploaded by operators to meet system requirements. This practice highlights a form of local policy translation, where compliance with national standards is achieved through internal division of labor rather than uniform technological mastery. Similar patterns have been identified in studies of public-sector digitalization, where operational alignment emerges through pragmatic adjustments rather than formal restructuring (Hazlett et al., 2013). The implication is that effectiveness is produced through organizational workarounds rather than strict adherence to idealized implementation models.

A synthesis of interview and document analysis reveals that the temporal structure of assessment activities has been reshaped by the e-Rapor system. Reporting deadlines are now synchronized with system update cycles, constraining pedagogical flexibility while enhancing administrative predictability. Teachers acknowledge that this temporal discipline improves data consistency, yet also note increased pressure during peak reporting periods. Such findings echo prior research suggesting that digital assessment systems intensify managerial control while redistributing workload pressures within schools (Putri & Firmansyah, 2023; Maula et al., 2024). The implementation at SMAN 1 Abung Tinggi thus exemplifies the dual character of digital governance as both enabling and constraining.

To illustrate empirically how implementation roles are distributed within the school, **Table 1** summarizes the primary actors involved in e-Rapor operation and their functional responsibilities. As shown in the table, the system's functionality depends on differentiated yet interdependent roles, with operators occupying a central coordinating position. This distribution corroborates the qualitative accounts indicating that technical competence rather than formal authority determines functional influence within the digital workflow. The table also helps clarify how institutional capacity is assembled from heterogeneous competencies rather than uniformly distributed skills. Such role differentiation reflects broader patterns of school readiness identified in developing regions (Zulkarnain & Kurniawati, 2023).

Table 1. Roles and Responsibilities in e-Rapor Implementation at SMAN 1 Abung Tinggi

Actor Category	Primary Responsibilities in e-Rapor Use
School Principal	Policy oversight, coordination, support
Vice Principal (Curriculum)	Alignment with assessment standards
e-Rapor Operator	Data entry, system synchronization
Subject Teachers	Assessment preparation and submission
Administrative Staff	Document verification and reporting

The presence of this role structure indicates that policy implementation effectiveness emerges from collective coordination rather than individual compliance. Interviews with school leaders emphasize that internal policy directives were issued to formalize these roles, demonstrating adaptive governance at the school level. This finding aligns with Grindle's view that implementation outcomes depend on the interaction between policy content and institutional context (Grindle, 1980). Leadership thus functions as a mediating variable that stabilizes implementation amid resource constraints. The case evidence suggests that leadership commitment compensates partially for infrastructural and competency limitations.

The empirical data also show that infrastructural constraints, particularly unstable internet connectivity, intermittently disrupt e-Rapor operations. Teachers and operators report delays during synchronization with national servers, which occasionally necessitate off-hour data entry to meet deadlines. These disruptions are consistent with documented digital divides affecting rural schools, where infrastructural disparities shape policy outcomes (Zulaikha et al., 2022; Pratolo et al., 2023). Despite these challenges, actors demonstrate adaptive behaviors that sustain implementation continuity. Such adaptations underscore the resilience of local institutions operating under structural limitations.

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From a policy theory perspective, the findings support the proposition that implementation is a negotiated process shaped by actor willingness, capacity, and contextual incentives. Teachers' acceptance of e-Rapor is closely linked to their perception of its usefulness and the availability of peer support, echoing arguments on professional willingness in policy implementation (Tummers et al., 2012). Resistance does not manifest as outright rejection but as selective engagement mediated by role specialization. This nuanced form of compliance complicates binary notions of success and failure in policy implementation. The case thus contributes empirically to understanding partial and adaptive adoption dynamics.

The first set of results demonstrates that e-Rapor implementation at SMAN 1 Abung Tinggi reflects a complex alignment between centralized digital policy design and localized organizational practices. The system's functionality depends less on technological sophistication than on institutional arrangements that redistribute tasks and responsibilities. This finding reinforces critiques of technology-centric policy evaluations that overlook organizational mediation processes (Hartati & Waskito, 2024; Nugraheni et al., 2024). By situating digital assessment within its operational context, the study highlights how rural schools actively shape policy enactment rather than merely receiving it. The implications of these dynamics provide a foundation for examining enabling and constraining factors in subsequent sections.

Determinants and Constraints Shaping e-Rapor Policy Implementation

The second strand of findings reveals that the implementation of e-Rapor at SMAN 1 Abung Tinggi is shaped by an interplay of enabling and constraining factors that operate simultaneously at individual, organizational, and structural levels. Interview evidence consistently indicates that policy outcomes are not determined by system design alone, but by how implementers interpret, accept, and operationalize digital mandates within their daily routines. This pattern affirms the long-standing proposition in public policy theory that implementation is contingent upon actor dispositions and contextual incentives rather than formal directives alone (Grindle, 1980; Greenberg et al., 1977). Teachers and administrative staff articulate that compliance with e-Rapor is negotiated through perceived benefits, workload implications, and institutional expectations. These findings position implementation as a relational process embedded in school micro-politics.

Human resource capacity emerges as the most decisive determinant influencing the depth and consistency of e-Rapor utilization. Qualitative data show that teachers with higher levels of digital literacy demonstrate greater autonomy and confidence in navigating the system, enabling more timely and accurate data submission. Conversely, teachers with limited digital competencies exhibit reliance on operators, which introduces procedural bottlenecks and reinforces functional dependency structures. This divergence mirrors empirical insights that digital literacy gaps are a central barrier in rural education technology adoption (Pratolo et al., 2023; Zulaikha et al., 2022). The findings suggest that capacity asymmetry within schools produces uneven implementation trajectories even under uniform policy mandates.

The role of professional willingness further mediates how capacity translates into practice. Several respondents emphasize that motivation to engage with e-Rapor is influenced by perceived alignment between the system and pedagogical values, rather than by coercive compliance mechanisms. Teachers who associate e-Rapor with improved assessment clarity and accountability express stronger commitment to learning its functionalities. This pattern resonates with the argument that public professionals' willingness to implement policy is shaped by content relevance and contextual fit (Tummers et al., 2012). Resistance, when present, is framed less as opposition to policy goals and more as anxiety over increased administrative burden and perceived loss of pedagogical discretion.

Organizational leadership plays a critical role in moderating these individual-level factors. Empirical observations show that school leaders actively intervene by issuing internal guidelines, redistributing workloads, and legitimizing peer-support mechanisms to stabilize implementation. Such leadership practices function as compensatory governance mechanisms that align policy expectations with operational realities. This aligns with operations management perspectives emphasizing the importance of managerial coordination in achieving policy–practice alignment in public organizations (Hazlett et al., 2013). Leadership support thus transforms potential constraints into manageable risks rather than systemic failures.

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Infrastructure availability constitutes a structural determinant that conditions the effectiveness of human and organizational resources. Respondents report intermittent internet connectivity as a persistent obstacle, particularly during synchronization with national databases, which directly affects reporting timeliness. These infrastructural constraints reinforce empirical claims that rural schools face systemic disadvantages in digital policy implementation due to uneven technological provision (UNESCO, 2021; Zulkarnain & Kurniawati, 2023). The findings indicate that infrastructure limitations amplify the consequences of human resource gaps, creating compound barriers to optimal system use. Policy success under such conditions depends heavily on local adaptive strategies rather than infrastructural adequacy alone.

To empirically illustrate the distribution of supporting and inhibiting factors identified through data analysis, Table 2 summarizes key determinants influencing e-Rapor implementation at SMAN 1 Abung Tinggi. As referenced in the surrounding analysis, the table demonstrates that determinants operate across multiple levels and interact dynamically rather than independently. The categorization highlights how enabling factors often function as counterweights to structural constraints rather than eliminating them entirely. This representation supports a systemic interpretation of implementation dynamics. The table also provides an analytical bridge between empirical observations and theoretical constructs.

Table 2. Key Determinants Influencing e-Rapor Implementation

Dimension	Supporting Factors	Constraining Factors
Human Resources	Digitally skilled teachers, operators	Digital literacy gaps, workload anxiety
Organization	Leadership support, peer collaboration	Role dependency, coordination delays
Infrastructure	School-owned devices	Unstable internet connectivity
Policy Context	Clear national standards	Limited technical assistance from authorities

The interaction between these determinants reveals that implementation outcomes are produced through balancing mechanisms rather than linear causality. For instance, leadership support mitigates infrastructural limitations by enabling flexible scheduling and informal coordination practices. Similarly, peer collaboration compensates for uneven digital literacy by redistributing technical tasks within the school. Such dynamics reflect the conception of implementation as an adaptive process shaped by negotiation and learning among actors (Grindle, 1980; Hill & Hupe, 2014). The case evidence thus challenges deterministic views of digital policy success or failure.

Comparatively, these findings align with prior studies that emphasize the multidimensional nature of digital assessment implementation in Indonesian schools. Hartati and Waskito (2024) argue that opportunities created by digital systems are inseparable from contextual challenges, a claim substantiated by the empirical patterns observed in this study. Literature reviews on e-Rapor effectiveness similarly note that administrative gains often coexist with increased dependency on technical intermediaries (Maula et al., 2024). The present findings extend this literature by showing how such dependencies are institutionalized through informal organizational arrangements. This contributes a granular understanding of implementation mechanics in rural contexts.

The findings also resonate with diffusion of innovation theory, particularly the notion that adoption is uneven and contingent on perceived compatibility with existing practices (Lee, 2024). At SMAN 1 Abung Tinggi, e-Rapor adoption does not occur uniformly across actors but follows differentiated pathways shaped by experience, skill, and institutional role. This selective adoption does not undermine policy objectives but redefines them through localized practices. The empirical evidence thus reframes partial adoption as a functional outcome rather than an implementation deficit. Such an interpretation advances theoretical debates on adaptive compliance in public sector digitalization.

In synthesis, the second set of results underscores that the implementation of e-Rapor is conditioned by a constellation of interrelated determinants that collectively shape policy realization.

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Human capacity, professional willingness, organizational leadership, and infrastructure operate as interacting variables rather than isolated factors. This empirical configuration affirms the relevance of integrative policy implementation frameworks that account for both agency and structure (Greenberg et al., 1977; Tummers et al., 2012). The findings provide a critical foundation for analyzing the broader implications of digital education policy in rural settings. These implications are further elaborated through systemic and theoretical integration in the subsequent section.

Institutional Implications and Theoretical Integration of e-Rapor Implementation

The third set of findings foregrounds the broader institutional implications of e-Rapor implementation at SMAN 1 Abung Tinggi, particularly in relation to governance transformation, professional practice reconfiguration, and sustainability of digital policy outcomes. Empirical data indicate that e-Rapor functions as an institutional mechanism that restructures accountability relationships between schools, teachers, and higher administrative authorities. School actors consistently describe the system as embedding external standards into internal routines, thereby reducing discretionary space in assessment reporting while increasing data visibility. This condition aligns with analyses that conceptualize digital assessment as a governance technology rather than a neutral administrative tool (Putri & Firmansyah, 2023; UNESCO, 2021). The findings suggest that institutional change is enacted incrementally through routine system use rather than through formal organizational redesign.

At the level of professional practice, the implementation of e-Rapor has altered how teachers conceptualize assessment work and professional responsibility. Interview narratives reveal that assessment activities are increasingly framed as data production tasks subject to verification and audit, which reshapes teachers' perceptions of their pedagogical roles. While some teachers interpret this shift as enhancing professionalism through standardization, others view it as intensifying administrative surveillance. This duality reflects broader tensions identified in studies of standard-based education reforms, where professional autonomy is redefined rather than eliminated (Zamili, 2021; Fayzullayevna, 2024). The empirical evidence demonstrates that digital systems mediate professional identity formation in subtle but consequential ways.

From an institutional sustainability perspective, the findings highlight that continued operation of e-Rapor depends on the stabilization of informal practices developed during implementation. Operators' centrality, peer mentoring arrangements, and flexible scheduling have become embedded features of school operations. These practices are not formally mandated by policy documents but emerge as pragmatic responses to contextual constraints. Such institutionalization of informal routines corroborates policy process theories emphasizing that durable policy outcomes arise from practice-based adaptations rather than strict compliance (Greenberg et al., 1977; Grindle, 1980). Sustainability thus appears contingent on organizational learning rather than technological upgrading alone.

The integration of e-Rapor into school governance also reshapes vertical accountability mechanisms. Document analysis indicates that reporting outputs generated through e-Rapor are increasingly used by district-level authorities as primary references for monitoring and evaluation. This reliance amplifies the consequences of data accuracy and timeliness at the school level. School leaders acknowledge that system-generated reports carry greater legitimacy than narrative explanations, reinforcing data-centric accountability logics. These patterns reflect broader shifts in public sector management where digital data infrastructures redefine performance evaluation practices (Hazlett et al., 2013; Wijaya & Badrujaman, 2025).

Empirical findings further suggest that institutional trust in digital systems is gradually constructed through repeated successful use rather than immediate acceptance. Teachers initially skeptical of e-Rapor report increased confidence after observing consistency between system outputs and manual records. This gradual trust-building process aligns with technology acceptance studies emphasizing experiential validation over abstract assurance (Dewi & Sukiman, 2021; Dewi & Budiman, 2024). Trust functions as a mediating variable that transforms mandatory use into routinized acceptance. The case evidence highlights trust as an emergent institutional property rather than an individual attitude alone.

To synthesize institutional impacts observed across governance, professional practice, and sustainability dimensions, Table 3 presents a thematic consolidation of key implications derived from empirical analysis. As referenced in the surrounding discussion, the table illustrates how e-Rapor

implementation produces multi-layered institutional effects that extend beyond immediate operational outcomes. Each thematic category reflects recurrent patterns identified through triangulated data sources. The table facilitates analytical integration between empirical observations and theoretical constructs. This synthesis underscores the systemic nature of digital policy implementation.

Table 3. Institutional Implications of e-Rapor Implementation

Dimension	Observed Institutional Implications
Governance	Data-driven accountability and reporting standardization
Professional Practice	Reconfiguration of assessment roles and responsibilities
Organizational Routines	Institutionalization of informal adaptive practices
Policy Sustainability	Dependence on organizational learning and trust formation

The institutional implications identified in this study resonate strongly with diffusion of innovation theory, particularly the notion that innovations are reshaped by adopters during implementation. At SMAN 1 Abung Tinggi, e-Rapor diffusion occurs through selective appropriation rather than uniform adoption. Actors integrate the system into existing structures while modifying practices to maintain functionality. This pattern reflects adaptive diffusion processes where compatibility is actively constructed through practice (Lee, 2024). The findings thus contribute empirical nuance to diffusion theory within public sector digitalization contexts.

The results also extend conceptual frameworks of educational digital transformation by highlighting the role of institutional mediation in rural settings. Existing frameworks often emphasize infrastructure and policy alignment, yet the case evidence demonstrates that institutional culture and informal governance mechanisms are equally decisive. School readiness is shown to be a dynamic condition shaped by leadership practices, peer relations, and experiential learning rather than a static precondition (Zulkarnain & Kurniawati, 2023; Hartati & Waskito, 2024). This insight challenges linear models of digital readiness and suggests the need for process-oriented evaluation approaches. The findings thus enrich conceptual debates on digital transformation in education systems.

Comparative reflection with prior empirical studies indicates strong convergence regarding the benefits of e-Rapor for administrative efficiency and data integration. Literature reviews consistently report improvements in reporting accuracy and systemic coherence following e-Rapor adoption (Maula et al., 2024; Amilia et al., 2024). The present study complements these findings by demonstrating how such benefits are institutionally produced under constrained conditions. Rather than attributing effectiveness solely to system design, the analysis reveals the centrality of organizational adaptation. This contribution advances empirical understanding of effectiveness as a situated outcome.

The findings further intersect with risk-oriented analyses of digital education services. Studies on e-Rapor risk profiles emphasize vulnerabilities related to system dependency and data integrity (Nugraheni et al., 2024; Sitoayu et al., 2023). Empirical evidence from SMAN 1 Abung Tinggi supports these concerns while showing that schools actively manage risks through redundancy practices and human mediation. Risk management thus becomes an embedded organizational function rather than an external technical process. This observation expands the scope of risk analysis by incorporating institutional agency.

From a theoretical standpoint, the study reinforces integrative policy implementation models that bridge structure and agency. Implementation outcomes emerge from the interaction of policy design, actor willingness, institutional capacity, and contextual constraints. This configuration aligns with multidimensional frameworks in public policy analysis that reject monocausal explanations (Tummers et al., 2012; Greenberg et al., 1977). The rural school context amplifies these interactions, making implementation dynamics more visible. The case thus provides a fertile empirical site for theory refinement.

The third set of findings demonstrates that e-Rapor implementation at SMAN 1 Abung Tinggi generates far-reaching institutional effects that reconfigure governance, professional practice, and sustainability logics. Digital education policy operates through everyday routines that gradually reshape organizational norms and accountability structures. These transformations are mediated by local

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adaptations that reconcile national standards with contextual realities. The study contributes theoretically by foregrounding institutional mediation as a core mechanism of digital policy implementation. Methodologically, it illustrates the value of qualitative case studies for uncovering the layered consequences of digital transformation in rural education settings.

CONCLUSION

The findings of this study demonstrate that the implementation of the e-Rapor system at SMAN 1 Abung Tinggi reflects a complex process of digital education policy enactment shaped by the interaction between technological design, institutional structures, and human agency. e-Rapor has contributed to improved administrative efficiency, data integration, and accountability in student assessment, yet its effectiveness is contingent upon organizational adaptation rather than technical functionality alone. Human resource capacity, professional willingness, leadership commitment, and infrastructural conditions collectively mediate how national digital mandates are translated into everyday school practices. In a rural context marked by digital divides, informal coordination mechanisms, peer support, and adaptive role distribution emerge as critical enablers of policy sustainability. These dynamics confirm that digital education policies operate as socio-technical governance instruments whose outcomes depend on localized negotiation and institutional learning. The study underscores the necessity of context-sensitive implementation strategies to ensure that digital transformation in education advances equity, effectiveness, and long-term institutional resilience.

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