

## **NAVIGATING INFRASTRUCTURE CRISES: TRANS-THEORETICAL LEADERSHIP AND PEDAGOGICAL IDENTITY TRANSFORMATION IN INDONESIAN PIONEER**

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### **Abstract**

Pioneer schools in Indonesia face infrastructure crises that impede learning quality. However, research on adaptive leadership strategies under such resource constraints remains limited. This study aimed to explore the implementation of trans-theoretical leadership as a strategic response to infrastructure crises and examine its impact on pedagogical identity transformation in pioneer schools. A phenomenological case study was conducted at SMPN 5 Cileunyi, involving six informants through in-depth interviews, participant observation, and document analysis. Data were analyzed using thematic analysis and interpretative phenomenological analysis supported by ATLAS.ti 24. Network analysis using ATLAS.ti revealed distinct stakeholder-specific code patterns distributed across 6 stakeholder categories, demonstrating interconnectedness among major themes. Three major themes emerged: the infrastructure crisis acting as a catalyst for organizational transformation, with crisis experience serving as a central organizing principle; the simultaneous integration of four leadership styles across stakeholder groups; and the reconstruction of collective pedagogical identity through cross-stakeholder collaboration. This study also revealed three empirical paradoxes: resource scarcity enhances creativity, informal structures strengthen coordination, and external pressure increases team cohesion. Trans-theoretical leadership manifests as a crisis-induced leadership ecosystem that transforms adversity into collective adaptive capacity. These findings contributed to the development of crisis-induced leadership evolution theory and provided practical frameworks for pioneering school management. Moreover, the ecosystem leadership model can be adapted for other pioneering schools through network-based interventions that focus on hub strengthening and bridge building.

**Keywords:** Infrastructure crisis, network analysis, pedagogical identity, pioneer schools, trans-theoretical leadership

### **Introduction**

Contemporary educational institutions worldwide face increasing transformational pressures that challenge traditional organizational capacities. In Indonesia, educational transformation has entered a complex phase in the digital and post-pandemic era, marked by the *Merdeka Belajar* policy and globalization demands. In this context, effective school leadership becomes crucial in managing change and fostering adaptive learning cultures (Bush & Glover, 2014; Day et al., 2016). Research indicates that leadership challenges intensify in newly established pioneer schools, particularly under infrastructure crises and resource limitations, which significantly affect organizational functioning (Leithwood et al., 2020).

An infrastructure crisis in education refers to inadequate physical facilities, technology, and resources that impede optimal learning (Hallinger & Heck, 2010). Pioneer schools, newly established institutions tasked with providing educational access in underserved or developing areas—face compounded challenges as they simultaneously establish institutional identity, develop organizational structures, and manage severe resource constraints. Scholars argue that the complexity of social, cultural, and policy contexts necessitates integrative leadership approaches rather than single-theory models. Trans-theoretical leadership emerges as a response to these multifaceted organizational demands, integrating multiple leadership theories to address the simultaneous challenges of institutional formation and crisis management, supported by empirical studies (Robinson et al., 2008).

In this study, trans-theoretical leadership combines four dimensions: transformational leadership, operationalized through vision-building and intrinsic motivation during crises (Bass & Riggio, 2006); transactional leadership, manifested through reward systems and performance management (Northouse, 2021); situational leadership, demonstrating adaptive style changes according to context (Hersey et al., 2013); and distributed leadership, emphasizing responsibility-sharing and multi-stakeholder collaboration (Spillane, 2006). Contemporary research highlights that trans-theoretical leadership requires concurrent application of multiple theories, contextual adaptability, stakeholder integration, and crisis responsiveness.

Existing literature predominantly focuses on single-theory approaches (Hallinger & Heck, 2010; Day et al., 2016) and stable school environments (Leithwood et al., 2020), with limited attention to multi-theory integration under resource constraints. Similarly, research on teacher professional identity mainly addresses individual transformation, neglecting collective institutional identity reconstruction during crises (Beijaard et al., 2004; Day & Kington, 2008). Significant gaps remain regarding how crises trigger collective identity shifts and how multi-stakeholder voices inform leadership complexity (Harris & Jones, 2020). Furthermore, limited research examines how pioneer schools operating simultaneously as new institutions and crisis environments - develop adaptive leadership ecosystems that transform resource constraints into organizational capacity.

This study addresses these gaps by developing a trans-theoretical framework for crisis leadership, examining collective identity reconstruction, and adopting a comprehensive multi-stakeholder approach. SMPN 5 Cileunyi was selected as a research site through theoretical sampling, representing a newly established pioneer school with limited infrastructure that has implemented adaptive leadership strategies over three years. The study investigates two primary questions: (1) How is trans-theoretical leadership implemented to address infrastructure crises in pioneer schools? This explores mechanisms, processes, and adaptive dynamics that arise from multi-theory integration in crisis contexts. (2) How does trans-theoretical leadership impact pedagogical identity transformation in resource-constrained schools? This examines collective identity reconstruction and the contributions of multi-stakeholder perspectives.

The study aimed to: (1) explore trans-theoretical leadership as a strategic response to infrastructure crises, including its mechanisms and adaptive processes, and (2) examine its impact on pedagogical identity transformation, focusing on collective reconstruction and multi-stakeholder insights. The research contributes theoretically by expanding understanding of trans-theoretical leadership in crisis contexts and developing a framework for crisis-induced leadership evolution. Practically, findings provide guidance for educational policy development and school leadership training in resource-constrained contexts, helping transform limitations into strengths through network-based interventions.

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**Literature Review**

This review examines trans-theoretical leadership in times of crisis, the challenges faced by Indonesian pioneer schools, and existing gaps in research on leadership, crisis response, and pedagogical identity in resource-constrained contexts.

***Theoretical frameworks in educational leadership***

Contemporary research shows that educational leadership studies remain dominated by single-theory approaches, which are often insufficient for addressing complex organizational crises (Harris & Jones, 2020). While school leaders have managed recent disruptions through high-quality distance education and curriculum adjustments, these responses reveal the limitations of traditional frameworks in addressing multi-dimensional challenges. Theoretical fragmentation creates gaps in understanding how leaders navigate resource constraints while maintaining effectiveness.

Transformational leadership (Bass & Riggio, 2006) emphasizes idealized influence and inspirational motivation, and situational leadership (Hersey et al., 2013) focuses on contextual adaptation. However, empirical evidence indicates that these theories often operate in isolation, failing to meet the simultaneous demands of crisis management (Riggio & Newstead, 2023). Single-theory applications are particularly inadequate in resource-constrained educational settings (Day et al., 2016).

Crisis leadership studies further highlight these limitations: transformational leadership alone may not be sufficient in crises (Piriyapol & Akaraborworn, 2024), while creating shared meaning and purpose remains essential (Leithwood et al., 2020). Collaborative leadership emphasizes understanding organizational capacity and student outcomes, underscoring the need for integrated approaches over isolated interventions (Hallinger & Heck, 2010; Robinson et al., 2008). Converging evidence suggests that effective crisis leadership requires frameworks that simultaneously address vision-building, resource optimization, stakeholder coordination, and adaptive capacity development (Riggio & Newstead, 2023).

***Crisis-induced leadership evolution: beyond conventional frameworks***

Crisis leadership theory has emerged as a distinct field but remains underdeveloped in educational contexts. While extensively elaborated and applied in various crises, it has received limited sustained focus in educational leadership research, despite increasing organizational disruptions (Harris & Jones, 2020).

Conventional models emphasize reactive management over proactive adaptation and transformation (Shaluf et al., 2003). A crisis is defined as an "unexpected abnormal situation presenting extraordinary risk that may become a disaster if mismanaged." Recent studies highlight that effective crisis leadership extends beyond individual skills to relational and collective approaches, emphasizing organizational capacity building over heroic individual responses (Haslam et al., 2020).

Significant gaps exist in explaining how adversity can catalyze positive transformation. Empirical evidence shows limitations of single-theory leadership during crises, with transformational leadership insufficient as a standalone approach (Piriyapol & Akaraborworn, 2024). Research on constraint-induced creativity demonstrates that resource limitations can trigger innovation that does not occur under normal conditions (Medeiros et al., 2014), validating that

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crises can activate dormant organizational capabilities. This evidence challenges deficit-based approaches and underscores the need for leadership strategies that transform constraints into competitive advantages.

### ***The trans-theoretical leadership integration imperative***

Educational leadership in pioneer schools facing infrastructure crises requires theoretical integration rather than single-model approaches. Traditional leadership theories assume stable environments and do not address the simultaneous demands of resource scarcity, stakeholder diversity, and rapid institutional development. Transformational leadership supports vision-building and motivation but lacks mechanisms for addressing operational challenges and resource allocation (Bass & Riggio, 2006). Situational leadership offers contextual adaptation but overlooks collective capacity-building (Hersey et al., 2013), while distributed leadership facilitates stakeholder engagement but does not integrate individual decision-making competencies needed in crises (Spillane, 2006).

Integrative leadership models combining psychological and behavioral insights provide a foundation for synthesis (van Knippenberg & Sitkin, 2013), yet they largely focus on stable contexts. Emerging trans-theoretical leadership research addresses these gaps by recognizing that crisis contexts activate multiple leadership demands simultaneously. Effective crisis leadership, therefore, requires concurrent application of transformational vision-building, transactional resource management, situational adaptation, and distributed stakeholder engagement, rather than selecting one approach based on context.

### ***Indonesian educational context and pioneer school dynamics***

Research indicates that the Indonesian education system faces systemic challenges that complicate leadership in pioneer schools. Assessments reveal poor learning outcomes, inadequate facilities, and disciplinary issues, forcing pioneer schools to address infrastructure deficits while establishing institutional identity and meeting national standards (Rosser, 2018).

The main national challenge has shifted from access to quality improvement, yet policies often emphasize quantitative expansion over qualitative development (World Bank, 2020). The *Merdeka Belajar* policy aims for educational transformation, but implementation faces technological and teacher training gaps, adding pressure on school leaders to bridge policy-practice gaps through innovative strategies (Saa, 2024).

Centralized curriculum design contrasts with locally trained teachers, creating implementation inconsistencies that require leadership capable of balancing compliance with contextual adaptation (WENR, 2022). Additionally, limited funding through the School Operational Assistance (BOS) program constrains infrastructure development, compelling pioneer schools to rely on creative leadership to optimize available resources.

Pioneer schools face unique challenges distinct from established institutions. Operating with minimal physical infrastructure, newly formed organizational structures, and nascent institutional identities, these schools must simultaneously build foundational systems while delivering quality education. Unlike established schools adapting to crises, pioneer schools exist in perpetual crisis conditions, requiring leadership approaches that treat resource scarcity not as temporary disruption but as a permanent organizational context demanding innovative adaptive strategies.

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***Pedagogical identity and professional development in crisis contexts***

Research on teacher professional identity has largely focused on individual-level transformation, leaving gaps in understanding collective institutional identity reconstruction during crises (Beijaard et al., 2004; Rushton et al., 2023). Teacher identity is a continuous, dynamic process shaped by tensions, adjustments, and contextual demands (Beauchamp & Thomas, 2009), yet the effects of shared adversity on synchronized identity evolution across multiple stakeholders remain underexplored.

Conventional studies emphasize gradual, individual reflection and professional development, such as engagement in research activities that support self-reflection and pedagogical growth (Dikilitaş & Yaylı, 2018). However, these frameworks do not adequately explain how crisis contexts accelerate identity transformation or foster collective professional identity shifts. Pioneer schools, in particular, face the dual challenge of building institutional identity while reconstructing individual teacher identities under resource constraints, highlighting the need for frameworks that account for the interplay between individual and collective identity development in adverse contexts.

***Stakeholder network dynamics in crisis adaptation***

Distributed leadership highlights the importance of multi-stakeholder engagement in educational improvement, but it lacks theoretical depth regarding network dynamics during crises. Distributed leadership is defined as the collective actions of leaders working together, producing outcomes greater than individual contributions (Spillane et al., 2001). Empirical studies show that effective teacher teams, parent engagement, and student participation correlate with academic gains (Harris & Jones, 2020). However, gaps remain in understanding how crises reshape stakeholder networks.

Recent research indicates that distributed agency is crucial for collective sensemaking and emotional containment during crises (Gleibs, 2025), yet mechanisms of network reconfiguration are underdeveloped. Traditional distributed leadership assumes established organizational structures, which pioneer schools often lack. These schools require approaches that simultaneously develop organizational structures and distribute leadership responsibilities, but the literature provides limited frameworks for how stakeholder networks form and evolve in emerging contexts.

***Gaps in the current literature and research contributions***

This review identifies four critical gaps in educational leadership research. First, theoretical fragmentation limits understanding of how multiple leadership approaches can be integrated for crisis management (Piriya-pol & Akaraborworn, 2024). Second, professional identity research focuses on individuals, neglecting collective identity reconstruction during adversity (Rushton et al., 2023). Third, limited attention to crisis-induced innovation restricts understanding of how constraints can enhance organizational capability. Fourth, frameworks addressing pioneer school dynamics are largely absent, hindering the development of context-appropriate leadership strategies.

These gaps are particularly significant in Indonesia, where learning inequalities and low student achievement challenge schools, and pioneer schools must establish institutional effectiveness under severe resource constraints (World Bank, 2020b). Single-theory approaches



dominate the literature (Day et al., 2016), and each leadership style alone shows limitations in crisis contexts (Piriyapol & Akaraborworn, 2024).

The trans-theoretical leadership framework addresses these gaps by providing an integrative approach that recognizes crises as catalysts for the simultaneous activation of multiple leadership dimensions. This framework extends beyond descriptive integration, proposing dynamic interactions among transformational, transactional, situational, and distributed leadership elements in response to crisis-induced demands.

### ***Toward a crisis-induced leadership evolution model***

The synthesis of crisis leadership theory, distributed leadership research, and pedagogical identity literature suggests the need for a comprehensive theoretical model that can explain how infrastructure crises trigger organizational transformation processes that enhance rather than diminish collective capacity. This theoretical development requires moving beyond conventional wisdom that views crisis as organizational threat toward frameworks that recognize crisis as potential catalyst for adaptive capacity development (Riggio & Newstead, 2023).

The theoretical integration proposed in this study contributes to educational leadership theory by providing a framework for understanding how multiple leadership theories can operate simultaneously in crisis contexts, how collective identity reconstruction processes differ from individual transformation, and how stakeholder network dynamics evolve in response to environmental pressures. These theoretical contributions provide a foundation for developing leadership strategies specifically designed for resource-constrained educational environments while contributing to broader understanding of organizational adaptation under adversity (Uhl-Bien & Arena, 2018).

## **Methodology**

### ***Research design and approach of the study***

This study employed a qualitative case study with a phenomenological approach, using purposive sampling to select six participants from SMPN 5 Cileunyi, a pioneer school in Bandung Regency experiencing infrastructure crises. Data were collected over six months (March–August 2024) through in-depth interviews, participant observation, and document analysis. The participants consisted of the school principal, vice principal, science and ICT teachers, administrative staff, and a school committee representative, each with at least one year of direct leadership involvement. Data analysis was conducted using ATLAS.ti 24, combining thematic analysis, interpretative phenomenological analysis (IPA), and network analysis to examine stakeholder relationships. Research trustworthiness was ensured through triangulation, member checking, peer debriefing, and audit trail documentation. The analysis generated three key findings: crisis as a catalyst for organizational transformation, multi-dimensional leadership integration, and collective identity reconstruction through cross-stakeholder collaboration. Additionally, the study identified three empirical paradoxes and mapped 38 network connections that illustrate stakeholder interconnectedness..

### ***Research site and participant***

The research site was selected using theoretical sampling principles to ensure that SMPN 5 Cileunyi represented the dynamics of a pioneer school operating under infrastructure crisis conditions. Established in 2021, the school exemplifies a newly founded state secondary institution functioning with significant resource constraints while adopting adaptive leadership strategies as mechanisms for both survival and transformation. The site demonstrates contextual characteristics that align with the study's theoretical framework.

SMPN 5 Cileunyi is located in the Cileunyi Sub-district of Bandung Regency, West Java, an area representing a rural–urban transition zone with diverse socio-economic backgrounds. In its inaugural year, the school operated in borrowed facilities at SDN Cibiru 10, which created severe space limitations and challenges for establishing institutional identity. At present, the school serves 287 students across grades 7–9, supported by 18 teaching staff and 3 administrative personnel, and operates under community supervision through a 7-member school committee.

Infrastructure challenges include the absence of dedicated science and computer laboratories, limited library facilities, insufficient classroom space relative to student enrollment, and constrained technology resources. These crisis conditions demand continuous adaptive leadership responses while ensuring compliance with national education standards and meeting community expectations. Such conditions make the site particularly suitable for examining trans-theoretical leadership implementation under resource constraints. Decision-making in educational contexts, as noted by [Dikdik et al. \(2024\)](#), is influenced by multiple interrelated variables that require systematic consideration.

Participant selection was guided by theoretical sampling criteria to ensure comprehensive stakeholder representation, which is critical for understanding multi-perspective leadership dynamics. Informants were chosen through purposive sampling, resulting in six participants representing distinct organizational roles and stakeholder categories. These included: the School Principal (SP), serving as the central strategic leader; the Vice Principal for Curriculum (VC), bridging administrative and academic functions; the Senior Science Teacher (ST), representing classroom-level adaptation in the face of infrastructure challenges; the ICT Teacher (IT), managing technology integration under severe resource limitations; Administrative Staff (AS), responsible for operational coordination and communication; and a School Committee Representative (SC), providing the community voice and external stakeholder perspective.

Selection criteria ensured both data quality and theoretical relevance. Each participant had a minimum tenure of one year at the school, providing experiential knowledge of its crisis conditions. All were directly involved in leadership or decision-making processes, had demonstrated engagement with adaptive strategies, and expressed willingness to participate in multiple in-depth interviews. Each participant functioned as a critical node within the school's stakeholder network, and their collective experiences were essential for examining how trans-theoretical leadership emerges through interaction, collaboration, and mutual adaptation in times of crisis.

### ***Data collection***

This section describes the comprehensive data collection procedures employed to ensure methodological rigor and theoretical depth in understanding trans-theoretical leadership implementation ([Creswell & Poth, 2018](#); [Lincoln & Guba, 1985](#)). Data were collected over six months (March–August 2024) using methodological triangulation to capture both leadership implementation and stakeholder relationship dynamics.

In-depth semi-structured interviews formed the primary data source, with each participant engaged for 60–90 minutes using phenomenological inquiry protocols. These interviews explored four key areas: crisis experiences and adaptive responses, multi-theory leadership implementation, professional identity transformation, and stakeholder relationship dynamics. All sessions were audio-recorded and transcribed verbatim to preserve participants' authentic perspectives.

Participant observation complemented the interviews by documenting leadership behaviors and interactions across 120 hours of fieldwork. Observations included formal meetings, crisis responses, collaborative planning, classroom activities, and community engagement. Observations followed systematic field note protocols, enabling the researcher to capture instances of multi-theory leadership application and stakeholder network activation.

Document analysis provided contextual verification by reviewing three years of organizational records, including strategic plans, infrastructure assessments, crisis adaptation reports, evaluation records, policy implementation materials, and communication documents. Together, these methods offered a comprehensive understanding of trans-theoretical leadership in practice, allowing triangulation across lived experiences, observed behaviors, and institutional documentation.

### ***Data analysis***

Data analysis combined interpretative phenomenological analysis (IPA) with thematic network visualization using ATLAS.ti 24 to capture both individual meaning-making and collective stakeholder relationships essential for understanding trans-theoretical leadership implementation (Smith et al., 2009).

Thematic Analysis began with line-by-line coding of interview transcripts, observation notes, and documents to generate thematic categories. Coding was both inductive, emerging from participant experiences, and deductive, guided by transformational, transactional, situational, and distributed leadership theories. Iterative coding produced stakeholder-specific themes and cross-case comparisons identified convergent and divergent patterns across organizational roles.

Network visualization and relationship mapping used ATLAS.ti 24 to create visual representations of thematic links and stakeholder interactions. Connections between codes were identified through co-occurrence patterns and participant-described conceptual linkages. Color-coded stakeholder categories (SP=Red, VC=Purple, ST=Green, IT=Blue, AS=Orange, SC=Cyan) and force-directed layout algorithms highlighted natural thematic clusters while preserving cross-stakeholder connections.

Phenomenological meaning construction examined how participants interpreted their leadership experiences, crisis adaptations, and identity transformations, identifying shared structures across stakeholders. Integrated pattern synthesis connected phenomenological insights with network relationships, analyzing individual experiences in relation to stakeholder positions to understand how personal meaning-making related to collective organizational dynamics. This approach provided a comprehensive understanding of both experiential depth and systemic relationship complexity.

### ***Trustworthiness***

Trustworthiness was ensured using multiple strategies appropriate for qualitative phenomenological research (Lincoln & Guba, 1985). Credibility was enhanced through prolonged  
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engagement with participants over six months, methodological triangulation across interviews, observations, and documents, and member checking, where participants reviewed preliminary interpretations to confirm accuracy. Transferability was addressed through rich, thick descriptions providing detailed contextual information, enabling readers to assess applicability to similar pioneer school contexts. Dependability was maintained via a systematic audit trail documenting all analytical decisions, coding procedures, and interpretation development. Confirmability was achieved through reflexivity, including documentation of researcher assumptions, bias awareness strategies, and peer debriefing to challenge interpretations and ensure objectivity.

Phenomenological authenticity was preserved by carefully representing participant voices, respecting their meaning-making, and verifying interpretations to ensure findings reflected stakeholder experiences rather than researcher constructions. Bias mitigation strategies included bracketing assumptions before data collection, incorporating multiple stakeholder perspectives, and external peer review. Triangulation of data sources and methods further strengthened credibility, while member checking validated interpretations with participants

## **Results**

These findings were organized by the four research questions, highlighting trans-theoretical leadership patterns, organizational paradoxes, collective identity transformation, and stakeholder perspectives, supported by thematic analysis and network visualization.

### ***How is trans-theoretical leadership implemented to address infrastructure crises in pioneer schools?***

This investigation explored how trans-theoretical leadership approaches are implemented in pioneer schools confronting infrastructure crises. Data were obtained through in-depth interviews with six informants, field observations, and documentation, then analyzed using thematic methods based on ATLAS.ti application with data saturation achieved after the sixth interview. Network analysis using ATLAS.ti generated stakeholder-specific codes distributed across six stakeholder categories, indicating strong interconnectedness among major themes. The network visualization does not merely illustrate abstract connections, but reveals a nuanced interplay of perspectives and practices that together shape leadership implementation in times of crisis. It highlights distinct yet complementary contribution patterns across stakeholder categories, each demonstrating particular thematic focus areas that are critical to understanding leadership dynamics. The School Principal cluster emerged as the central hub, generating primary codes that emphasize Leadership Practices, Crisis Experience, Collaboration Networks, Personal Meaning, and Leadership Assessment. This cluster reflects the principal's role as both the symbolic and functional leader, bridging institutional vision with on-the-ground realities.

The Vice Principal cluster contributed codes centered on Strategic Adaptation, Leadership Perception, Curriculum Impact, and Collaborative Leadership, reflecting the adaptive and operational dimensions of leadership necessary to stabilize learning activities during infrastructure crises. The Science Teacher provided codes with particular emphasis on Role Transformation, Leadership Perception, Learning Crisis Impact, and Teacher Adaptation, underscoring how instructional staff recalibrated their pedagogical roles in response to both infrastructural limitations and leadership directives. The ICT Teacher contributed codes around Professional Growth, Learning Innovation, and ICT-Specific Challenges, highlighting the dual role of teachers as both

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learners and innovators when navigating technology-mediated education in constrained environments. From the non-teaching perspective, the Administrative Staff generated codes centered on Support Role, Personal Meaning, Operational Impact, Independent Initiative, and Work Communication.

This cluster demonstrates how administrative actors extended leadership support beyond routine duties, often assuming proactive initiatives to ensure school functionality under crisis conditions. Meanwhile, the School Committee cluster emphasized Bridging Role, Personal Meaning, Leadership Assessment, Future Vision, and Community Engagement. This suggests that parents and community representatives played a significant part in negotiating between school leadership and broader community expectations, ensuring sustainability of leadership strategies through collective identity reinforcement. Taken together, these findings illustrate that transtheoretical leadership implementation in pioneer schools is not a linear, top-down process but rather a complex ecosystem of shared responsibilities. Each stakeholder contributes distinct yet interdependent practices that allow the school to survive and adapt under infrastructure crisis conditions, thereby affirming the importance of distributed and context-sensitive leadership models.

**Table 1.** *Thematic analysis - trans-theoretical leadership implementation*

Theme	Subtheme /Code	Description	Stakeholder	Key Evidence Source
Leadership practices	Transformational vision building	Shared meaning creation during crisis	SP, VC	Building shared vision amid uncertainty
	Transactional resource management	Systematic resource allocation and rewards	SP, AS	Maintaining quality amid limitations
	Situational contextual adaptation	Style switching based on immediate needs	VC, ST, IT	From waiting decisions to a proactive approach
	Distributed collaborative engagement	Multi-stakeholder decision-making processes	All stakeholders	Family approach more effective than top-down
Crisis experience	Infrastructure limitations	Physical constraints driving innovation	SP, ST, IT	Until now, we haven't had a laboratory
	Borrowed facilities identity challenge	Institutional identity formation difficulties	SP, AS, SC	Like building a house on borrowed land

	Resource scarcity adaptation	Creative solutions under constraints	All stakeholders	Making teaching aids from waste materials"
Collaboration networks	Cross-functional Integration	Breaking down traditional role boundaries	SP, VC, AS	Teachers are also innovators and facilitators.
	Community partnership building	External stakeholder engagement strategies	SC	Voicing classroom needs through community forums
	Informal coordination mechanisms	Organic communication patterns	AS, ST, IT	Oral coordination, WhatsApp groups

***What paradoxes emerge in trans-theoretical leadership practices amid facility limitations?***

Multi-stakeholder perspectives provide comprehensive insights into three empirical paradoxes that challenge conventional organizational assumptions about resource management, coordination mechanisms, and external pressure impacts.

**Table 2.** *Thematic analysis – empirical paradox in crisis leadership*

Paradox	Theme/Code	Evidence	Stakeholder	Mechanism
Resource scarcity enhances creativity	IT-Challenge	"School doesn't have a computer laboratory yet."	ICT Teacher	Constraint induced innovation activation
	IT-Innovation	"Creating simulations through images and interactive videos"	ICT Teacher	"Creative solution development"
	ST-Adaptation	Style switching based on immediate needs	VC, ST, IT	From waiting decisions to a proactive approach"
	Path Analysis Evidence	Crisis codes to Innovation codes (shortest path length = 2)	Network Analysis	Systematic innovation pathway
Informal	AS-	"Coordination		Organic

structure strengthens coordination	Communication	is more often oral or through WhatsApp."	Admin Staff	network utilization
	VC-Collaborative Leadership	"Family approach more effective than top-down"	Vice Principal	Relationship-based management
	Network Density Increase	67% higher connectivity in informal networks	All stakeholders	Crisis-induced network formation
External pressure increases internal cohesion	SC-Community Engagement	"Bridging communication with community leaders"	School Committee	Boundary spanning function
	AS-Personal Meaning	"Having a role in building from scratch, part of founding history"	Admin Staff	Collective identity strengthening
	SP-Solidarity	"Physical and emotional pressure creates unity	Principal	Crisis bonding effect

***How is pedagogical identity formed and developed under limited infrastructure conditions?***

ATLAS.ti analysis revealed three superordinate themes that interact dynamically. Network visualization demonstrates stakeholder experiences with interconnected relationships, using a force-directed algorithm with community detection.

**Table 3.** *Thematic analysis - collective professional identity reconstruction*

Superordinate Theme	Code/ Subtheme	Identity Transformation	Stakeholder	Process Mechanism
Crisis-leadership nexus as transformation catalyst	SP-Crisis (Crisis Experience)	Central organizing principle for adaptations	Principal	Crisis as a systematic transformation trigger
	SP-Leadership (Leadership Practices)	Most prominent theme in narratives"	Principal	Adaptive leadership response activation
	Network Centrality	Crisis experience connects all organizational	All stakeholders	Synchronized transformation process

adaptations				
Multi-stakeholder leadership ecosystem	SP-Collaboration	Leadership centrality with 23 direct connections	Principal	Trans theoretical integration hub
	VC-Collaborative Leadership	Curriculum-leadership bridge function	Vice Principal	Boundary spanning role development
	ST/IT-Innovation Clusters	Pedagogical innovation focus	Teachers	Creative adaptation specialization
	AS-Operational Support	System maintenance and communication facilitation	Admin Staff	Operational backbone function
	SC-Community Connector	External connectivity and resource mobilization	School Committee	Network expansion role
Collective professional identity reconstruction	ST-Transformation	"From conventional educator to innovator and facilitator"	Science Teacher	Role redefinition process
	IT-Professional Growth	"ICT teachers must have adaptive, creative abilities"	ICT Teacher	Skill expansion and capability building
	AS-Personal Meaning	"Having a role in building from scratch"	Admin Staff	Purpose and meaning reconstruction
	SC-Dedication	Form of dedication to education and village future	School Committee	Mission expansion and commitment

***How do multi-stakeholders perceive trans-theoretical leadership implementation in infrastructure limitation contexts?***

The analysis confirmed the presence of multiple leadership approaches across stakeholder categories, providing empirical support for trans-theoretical leadership as an observable organizational phenomenon rather than a theoretical abstraction.

**Table 4.** *Thematic analysis – multi-stakeholder leadership*



Leadership Dimension	Code/Evidence	Stakeholder Perception	Source	Implementation Pattern
Transformational Leadership Evidence	SP-Leadership	"Principal open to teacher input"	Principal	Idealized influence demonstration
	ST- Transformation	"Individual consideration impacts on role evolution""	Science Teacher	Inspirational motivation effects
	Visionary Communication	"Building shared meaning during crisis periods"	SP, VC	Vision articulation and meaning-making
Situational Leadership Evidence	SP-Adaptability	"Give space for opinions but dare to decide quickly"	Principal	Adaptive style switching capability
	VC-Leadership Perception	"From waiting for decisions to a proactive approach"	Vice Principal	Contextual adaptation demonstration
	Responsive Adjustment	"Adapting coordination methods to immediate needs"	AS, ST	Situational responsiveness patterns
Transactional Leadership Evidence	VC-Curriculum Impact	"Maintaining quality amid facility limitations"	Vice Principal	Goal-oriented management approach
	As-Support Role	Help teachers with class administration	Admin Staff	Contingent reward and support systems
	Performance Management	Systematic resource allocation and task coordination	SP, AS	Structured exchange relationships
Distributed Leadership Evidence	SP- Collaboration	Highest network connectivity (23 direct connections)	Network Analysis	Central coordination hub function
	Cross-Cluster Bridging	Multiple stakeholder leadership emergence	All stakeholders	Collective leadership activation
	Shared Decision-Making	"Family approach with shared responsibilities "	VC, SC	Distributed authority patterns
Coordination Mechanisms	AS- Communication	More often conducted orally or through WhatsApp groups	Admin Staff	Informal network optimization
	SC-Boundary Spanning	Voicing additional classroom needs through community forums	School Committee	External- internal connection facilitation

The thematic analysis revealed four key empirical patterns that address the research objectives: First, trans-theoretical leadership manifests as a crisis-induced leadership ecosystem involving simultaneous integration of transformational vision-building, transactional resource management, situational contextual adaptation, and distributed collaborative engagement across stakeholder groups, rather than sequential application of single approaches. Second, three empirical paradoxes challenge conventional organizational wisdom: resource scarcity enhances creativity through

constraint-induced innovation, informal structures strengthen coordination through organic network formation, and external pressure increases team cohesion through shared adversity experiences.

Third, collective pedagogical identity reconstruction occurs through synchronized transformation across multiple stakeholder groups, with crisis experience serving as a central organizing principle that accelerates professional development from individual to collective institutional levels. Fourth, multi-stakeholder perspectives reveal differentiated yet complementary understanding patterns where each organizational role contributes distinct but interconnected views of leadership effectiveness, creating a comprehensive ecosystem understanding through stakeholder network integration. These findings provide empirical evidence for trans-theoretical leadership as a crisis-induced ecosystem that transforms adversity into collective adaptive capacity through network-based stakeholder integration, contributing to crisis-induced leadership evolution theory and offering practical frameworks for pioneer school management.

## Discussion

The findings of this study demonstrate that trans-theoretical leadership is exercised not through a sequential application of different models, but through the simultaneous integration of transformational, transactional, situational, and distributed approaches. This resonates with Burns and Stalker's (1961) argument that organic structures are more adaptive in unstable environments compared to mechanistic systems. Similarly, van Knippenberg and Sitkin (2013) emphasize that integrative models of leadership, combining insights from psychological theories and prior leadership research, provide a robust foundation for theoretical synthesis. In line with this, Bush and Glover (2014) confirm that the effectiveness of leadership approaches is highly dependent on the context in which they are applied. These perspectives collectively highlight the importance of pluralistic and adaptive leadership practices in complex organizational settings.

Three paradoxes emerged from the findings: resource scarcity was shown to enhance creativity, informal structures strengthened coordination, and external pressure increased internal cohesion. These results align with Medeiros et al. (2014), who provide empirical evidence that crisis-induced innovation arises when resource limitations stimulate creativity that would not emerge under normal circumstances. Harris (2008) adds that distributed leadership can increase organizational capacity and outcomes when properly implemented, showing the potential of informal and collaborative structures. Furthermore, Tajfel and Turner (1979) explain how external threats reinforce in-group identification and internal cooperation, supporting the finding that pressure from outside can solidify organizational unity. These paradoxes reveal the counterintuitive dynamics of organizational adaptation under crisis conditions.

The research also revealed that collective pedagogical identity is reconstructed through synchronized transformation across different stakeholder groups, a process accelerated by the shared experience of crisis. Beijgaard et al. (2004) argue that teacher identity is best understood as a continuous process of construction and reconstruction, shaped by contextual tensions and transformations. Day and Kington (2008) further show that identity, well-being, and effectiveness are deeply interconnected in the emotional contexts of teaching. In addition, Beauchamp and Thomas (2009) describe identity as multifaceted, plural, and constantly evolving rather than fixed. These perspectives support the finding that collective identity formation is relational, adaptive, and dynamic, shaped by both internal processes and external pressures.

Finally, the study demonstrates that stakeholders hold differentiated yet complementary

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perceptions of leadership, with each role contributing distinct understandings while maintaining an integrated ecosystem of functioning. Spillane et al. (2001) conceptualize distributed leadership as a collective property of leaders working together to create practices greater than the sum of individual efforts. Harris and Jones (2020) provide evidence that academic gains occur when schools foster effective teacher teams, encourage strong parental involvement, and ensure active student participation in decision-making. Similarly, Hallinger and Heck (2010) establish that collaborative leadership is essential for strengthening school capacity and student achievement. Taken together, these findings provide empirical support for the implementation of trans-theoretical leadership in crisis contexts, demonstrating its value in enabling organizational adaptation, innovation under constraints, identity development, and collaborative leadership practices

### **Conclusion**

The investigation revealed that trans-theoretical leadership implementation occurs through network analysis, showing stakeholder-specific code patterns distributed across six stakeholder categories, indicating interconnectedness among major themes. The findings demonstrate the simultaneous integration of four leadership styles across stakeholder groups, with crisis experience serving as a central organizing principle. Network visualization reveals distinct stakeholder contribution patterns where each category demonstrates specific thematic focus areas while maintaining cross-category connections. The School Principal cluster shows primary codes focusing on Leadership Practices, Crisis Experience, Collaboration Networks, Personal Meaning, and Leadership Assessment themes, while other stakeholders contribute codes centered on their specific organizational functions.

The analysis revealed three empirical paradoxes that emerged from stakeholder experiences. Resource scarcity enhances creativity, with network evidence showing it-challenge codes co-occurring with it-innovation codes, and path analysis showing crisis codes to innovation codes having the shortest path length. Informal structure strengthens coordination, with as- communication codes emphasizing informal coordination methods over formal hierarchical communications, and VC-collaborative leadership codes demonstrating family approach patterns. External pressure increases internal cohesion, with SC-community engagement codes demonstrating boundary spanning characteristics while connecting strongly with internal stakeholder themes, and as-personal meaning codes showing strong thematic connections with other stakeholder categories.

ATLAS.ti analysis revealed three superordinate themes that interact dynamically regarding pedagogical identity formation under limited infrastructure conditions. The crisis-leadership nexus serves as a transformation catalyst, with central nodes SP-crisis and SP-leadership showing strong connections to other stakeholder themes. The multi-stakeholder leadership ecosystem demonstrates central nodes SP-collaboration, VC-collaborative leadership, and SC-community engagement, showing multiple bridging relationships. Collective professional identity reconstruction shows central nodes ST-transformation, it- professional growth, and as-personal meaning with multiple transformation- related codes. Professional identity transformation occurs at all levels, with science teachers evolving from conventional educators to innovators and facilitators, ICT teachers developing adaptive, creative abilities, administrative staff feeling they have a role in building from scratch, and committee members viewing their role as dedication to education.

ATLAS.ti analysis confirms the presence of multiple leadership approaches across stakeholder categories. Transformational leadership evidence appears through SP-leadership codes emphasizing Principal open to teacher input patterns and ST-transformation codes showing Available online at <http://jurnal.radenfatah.ac.id/index.php/edukasi>

individual consideration impacts. Situational leadership evidence manifests through SP- leadership codes showing adaptive style switching and VC-leadership perception codes demonstrating contextual adaptation. Transactional leadership evidence shows through VC- curriculum impact codes as goal-oriented management and as-support role codes as contingent reward systems. Distributed leadership evidence manifests through the highest network connectivity across all stakeholder categories, with sp-collaboration showing direct connections with other nodes and cross-cluster bridging with multiple stakeholder leadership emergence.

The recommendations highlight viewing infrastructure crises as opportunities for innovation, developing trans-theoretical leadership skills, and prioritizing collaborative, ecosystem-based practices. Policies should support informal coordination, stakeholder capacity building, and reward adaptive innovation. Future research should employ multi-site, longitudinal, and mixed-method studies to comprehensively assess crisis-responsive leadership effectiveness.

The study shows that effective leadership in crisis emerges organically through collaboration and networked stakeholder engagement, rather than relying solely on resources or hierarchy. This calls for a shift in leadership theory and education toward developing collaborative, multi-theory integration skills. Policies should recognize and support innovation and collective achievements. Crises, rather than being merely challenges, can activate latent organizational capacities and accelerate professional identity development among teachers.

### **Disclosure statement**

No potential conflict of interest was reported by the authors.

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