Jurnal Ilmiah Peuradeun
The Indonesian Journal of the Social Sciences
Journal Homepage:
https://journal.scadindependent.org/index.php/jipeuradeun

Vol. 14, No. 2, May 2026	Copyright © 2026, is licensed under a CC-BY-SA
Pages: 747-772	Publisher: SCAD Independent
DOI: https://doi.org/10.26811/peuradeun.v14i2.2622	P-ISSN: 2338-8617 / E-ISSN: 2443-2067

Modeling Systemic Policy Priorities in Community-Based Non-Formal Education: A Hybrid Delphi–ISM–ANP Approach in Indonesia

Saiful Hadi[1]; Aang Kisnu Darmawan[2]; Abd Ghofur[3]; Elais Retnowati[4]; Mohamad Zubaidi[5]
[1,3]*Universitas Islam Negeri Madura, Indonesia*
[2]*Universitas Islam Madura, Indonesia*
[4]*Universitas Negeri Jakarta, Indonesia*
[5]*Universitas Negeri Gorontalo, Indonesia*
[1]*Correspondence Email: saifulhadi@iainmadura.ac.id*

Article Info

Received: December 3, 2025
Accepted: May 24, 2026
Published: May 30, 2026
Online First: May 30, 2026

Keywords

Community-Based Non-Formal Education;
Human Capital Development;
Multi-Level Governance;
Policy Synchronization;
Systemic Policy Strategy.

Abstract

Community-Based Non-Formal Education (CB-NFE) in Indonesia continues to face structural challenges related to fragmented governance, policy inconsistency, and unstable operational funding, limiting its contribution to inclusive lifelong learning and community empowerment. This study aimed to identify critical development factors and determine strategic policy priorities to improve the sustainability of CB-NFE. The research employed a sequential hybrid approach integrating Delphi, Interpretive Structural Modeling (ISM), MICMAC, and Analytic Network Process (ANP). Data were collected through expert judgment involving 12 participants from academia, government institutions, and non-formal education practitioners. The findings revealed that policy synchronization and operational funding support functioned as the primary structural drivers of CB-NFE development, while tutor certification and professional development emerged as the most influential strategic leverage for improving broader systemic outcomes. These findings suggested that strengthening human capital can generate a greater systemic impact than isolated regulatory interventions. The study contributes to network-based policy analysis in non-formal education and offers strategic implications for strengthening community-based lifelong learning systems in decentralized governance contexts.

A. Introduction

Community-Based Non-Formal Education (CB-NFE) in Indonesia has become a critical pillar for achieving Sustainable Development Goal 4 (SDG 4), particularly in expanding inclusive lifelong learning and strengthening community empowerment in marginalized regions (Hafid et al., 2024; Nurhaliza et al., 2025; Vann et al., 2025). However, despite its strategic role, the sustainability of CB-NFE continues to face persistent structural challenges rooted in fragmented governance, policy inconsistency, and weak institutional coordination between central and regional authorities (Hanafi et al., 2025; Maulida & Juwono, 2025; Sukari & Ahmadi, 2024).

The main issue is not merely limited resources, but the inability to synchronize regulations, authority, and operational support across multiple administrative levels, resulting in uneven policy implementation and ineffective technical assistance at the grassroots level (Ario Bismo et al., 2024; Bida, 2021; Ningrum et al., 2025; Shantini & Sudiapermana, 2016). This condition reflects a broader Multi-Level Governance (MLG) dilemma in which policy asymmetries and institutional fragmentation weaken the capacity of non-formal education systems to function as resilient and inclusive learning ecosystems (Green & Koebele, 2025; Müller et al., 2024). As a consequence, many CB-NFE initiatives remain fragmented, highly dependent on temporary interventions, and unable to generate sustainable systemic impact.

The persistence of these problems also indicates a deeper epistemic limitation in the way CB-NFE policies have been formulated and implemented. Existing policy approaches largely rely on linear and partial problem-solving models that treat educational challenges as isolated issues rather than interconnected systemic processes (Sinnema et al., 2022; Tromp & Datzberger, 2021). In practice, policy interventions are often designed through technocratic "wishlists" that prioritize visible outputs without adequately considering causal interdependencies, feedback loops, and leverage structures within the education system.

Institutional accreditation, for example, is frequently promoted as a primary indicator of educational quality, while more foundational factors such as tutor welfare and community participation receive insufficient attention (Jailani et al., 2025; Zaifullah et al., 2023). Such approaches tend to produce superficial improvements because they fail to identify the actual leverage points capable of generating broader systemic transformation (Sinnema et al., 2022; Tromp & Datzberger, 2021). Consequently, policy interventions often

become inefficient, fragmented, and poorly targeted, while public resources are allocated to outcomes rather than to the structural drivers shaping long-term sustainability (Ramdhan, 2025).

Current CB-NFE scholarship has extensively discussed barriers related to policy and regulation (Garg et al., 2026), socio-cultural conditions (Loganathan et al., 2023; Nurhaliza et al., 2025), infrastructure and resource limitations (Loganathan et al., 2023; Rahman et al., 2022), as well as economic and institutional constraints (Kalenda et al., 2023). Previous studies have also proposed several adaptive strategies, including culturally responsive education models (Nurhaliza et al., 2025), stakeholder engagement frameworks (Garg et al., 2026; Habib et al., 2024), social-emotional learning integration (Margeviča-Grinberga & Kalēja, 2025), and institutional support mechanisms (Loganathan et al., 2023).

Nevertheless, the existing literature remains predominantly descriptive and fragmented. Most studies focus on identifying barriers or proposing isolated solutions without explaining how policy mechanisms interact dynamically within complex governance networks. As a result, there is still limited understanding of how strategic interventions spread, reinforce, or weaken one another within CB-NFE systems. More importantly, the literature has not sufficiently examined how Human Capital (DesJardine & Wang, 2025; Knudsen & Lien, 2023) and Social Capital (Supriyanto et al., 2025; Bhandari & Bhuyan, 2023; Wulandhari et al., 2022) function as systemic buffers capable of sustaining educational resilience amid regulatory uncertainty and institutional fragmentation. This theoretical gap demonstrates the need for a more integrated analytical framework capable of identifying causal structures, strategic leverage points, and dynamic policy interactions in non-formal education systems.

Responding to this gap, the present study proposes a systemic policy analysis framework through the integration of Delphi, Interpretive Structural Modeling (ISM), and Analytic Network Process (ANP). Rather than functioning merely as a technical combination of methods, this hybrid framework is positioned as an epistemic instrument for understanding complex educational governance systems in the Global South. Delphi is employed to validate key development factors through expert consensus (Ifenthaler et al., 2024; Shin et al., 2025), ISM is used to map hierarchical causal relationships and distinguish structural drivers from dependent outcomes (Zhang et al., 2023), while ANP enables the identification of dynamic interdependencies and feedback loops among strategic factors (Quezada et al., 2024). The integration of these approaches allows the study to move beyond linear policy analysis toward a network-based understanding of CB-NFE sustainability.

Moreover, this framework provides a more transparent and systematic basis for prioritizing interventions under conditions of institutional complexity and limited resources (Alshameri et al., 2025; Xing et al., 2024).

Accordingly, this study aims to identify the critical factors influencing CB-NFE development and determine strategic policy priorities capable of strengthening the sustainability of community-based non-formal education in Indonesia. The study contributes not only methodologically through the hybrid Delphi–ISM–ANP approach, but also conceptually by explaining how policy synchronization, human capital development, and social capital interact within decentralized educational governance systems. Ultimately, this research seeks to provide a strategic roadmap for transforming CB-NFE from a fragmented policy sector into a resilient, inclusive, and sustainable lifelong learning ecosystem aligned with the global mandate of SDG 4.

B. Method

This study employed an exploratory sequential mixed-methods design to identify critical development factors and determine strategic policy priorities for Community-Based Non-Formal Education (CB-NFE) in Indonesia. The unit of analysis focused on the systemic interaction between governance, operational funding, and human capital within the CB-NFE ecosystem. To ensure multidimensional content validity, the study utilized purposive sampling to establish an expert panel consisting of 12 participants representing three strategic domains: academics specializing in non-formal education studies, practitioners managing community learning centers and training institutions, and policymakers from education-related government institutions. All participants fulfilled the minimum criterion of having at least five years of professional experience in curriculum development, institutional management, or policy formulation related to non-formal education.

Data collection and analysis were conducted through a three-stage sequential hybrid process integrating Delphi, Interpretive Structural Modeling (ISM), MICMAC analysis, and Analytic Network Process (ANP). In the first stage, the Delphi method was employed to validate the most significant factors influencing CB-NFE development through three iterative rounds of expert questionnaires. Consensus was determined using a high median score and a standard deviation threshold below 0.65. Factors that failed to achieve the required consensus level were revised based on qualitative feedback from the expert panel or excluded from subsequent analysis. The validated factors were then processed in

the second stage using ISM to identify hierarchical and causal relationships among variables through the construction of a Self-Structural Interaction Matrix (SSIM) and a Reachability Matrix. MICMAC analysis was subsequently applied to classify factors according to their driving power and dependence power, enabling the identification of independent drivers, linkage variables, dependent factors, and autonomous variables within the CB-NFE system.

In the final stage, ANP was utilized to determine strategic priorities by accommodating interdependencies and feedback relationships identified in the ISM structure. Pairwise comparisons were conducted using the Saaty Scale ranging from 1 to 9. The consistency ratio (CR) was maintained below the acceptable threshold of 0.10 to ensure the reliability of expert judgments. Aggregation of expert evaluations was calculated using the geometric mean method to maintain consistency in group decision-making. The resulting analysis produced a consistency ratio of 0.00000, indicating a highly reliable assessment process and providing a robust basis for identifying strategies with the greatest systemic leverage under conditions of limited resources.

Table 1. Hybrid delphi–ISM–ANP methodological framework

Method Components	Detailed Description	Validity Parameters and Standards
Research Design	*Exploratory Sequential Mixed-Methods*.	Integrating qualitative consensus into quantitative network modeling.
Unit of Analysis	CB-NFE development strategy in Indonesia.	Focus on systemic interactions between regulation, funding, and human resources.
Expert Panel (N=12)	*Strict Purposive Sampling*: 1. Academics (PNF Professor/ Doctor). 2. Practitioners (PKBM/LKP Managers). 3. Bureaucrats (Ministries/ Departments).	*Criteria:* Minimum 5 years of experience in the PNF field. Ensures multidimensional *content validity*.
Phase I: Hybrid Delphi	Validation of key factors through iterative questionnaires (3 rounds).	Consensus is reached if the Median (M) is high and the Standard Deviation (SD) < 0.65.
Phase II: ISM & MICMAC	Mapping the causality hierarchy *(Driver–Dependent)* through the SSIM and *Reachability* matrices.	Classify factors into 4 strategic quadrants *(Independent, Linkage, Dependent, Autonomous)*.
Stage III: ANP	Quantification of strategic priorities by accommodating *feedback loops*. The network structure is built based on the ISM results.	*Pairwise comparison* using the Saaty Scale (1–9). The *Consistency Ratio* (CR) must be < 0.10 (Results of this study: CR = 0.00000).

Ethical considerations were strictly maintained throughout the research process. Prior to participation, all experts provided informed consent and voluntarily agreed to participate in the Delphi and ANP sessions. Participant anonymity and confidentiality were fully protected during data collection, processing, and reporting. All responses were used exclusively for academic purposes, and no individual or institutional identities were disclosed during the evaluation process.

C. Results and Discussion

This section presents the empirical findings generated through the sequential hybrid Delphi–ISM–ANP approach. The results are organized systematically to illustrate the validation of key development factors, the structural relationships among variables, and the prioritization of strategic interventions for strengthening Community-Based Non-Formal Education (CB-NFE) in Indonesia. The presentation focuses on empirical evidence derived from expert assessments and structural modeling, while the subsequent discussion interprets the findings in relation to the broader context of governance, human capital, and systemic policy development.

1. Results

This section presents the empirical findings generated through the sequential hybrid Delphi–ISM–ANP framework. The results are organized systematically to demonstrate the validation of critical development factors, the structural relationships among variables, and the prioritization of strategic interventions for strengthening Community-Based Non-Formal Education (CB-NFE) in Indonesia. The presentation focuses exclusively on empirical evidence derived from expert assessments and network-based modeling without incorporating theoretical interpretation or conceptual discussion.

The first stage of the analysis employed the Delphi method to validate the most significant factors influencing the sustainability of CB-NFE development. The validation process was conducted through three iterative rounds involving 12 experts representing academic institutions, non-formal education practitioners, and government policymakers. Consensus was evaluated using median values, standard deviation (SD), and coefficient of variation (CV). Factors with SD values below the threshold of 0.65 were categorized as achieving expert consensus.

Table 2. Consensus statistics of key factors for CB-NFE development (N=12)

Code	Key Factors of *CB-NFE*	Median (M)	SD	CV	Criteria	Information
F1	Synchronization of Central and Regional NFE Policies	4.83	0.39	0.08	Passed	High Critical Factor
F2	Quality and Competence of Tutors/Facilitators	4.92	0.28	0.06	Passed	The Most Critical Factor
F3	Availability of Sustainable Operational Funds	4.75	0.45	0.09	Passed	High Critical Factor
F4	Relevance of the Curriculum to the Local Job Market	4.75	0.45	0.09	Passed	High Critical Factor
F5	Solid Partnership with the Business World (DUDI)	4.58	0.51	0.11	Passed	Strong Consensus
F6	Active Community Participation in Evaluation	4.42	0.51	0.11	Passed	Strong Consensus
F7	Regulation of Village Fund Allocation for NFE	4.33	0.65	0.15	Fail	High Dispersion (SD > 0.65)
F8	Recognition and Accreditation of NFE Institutions	4.33	0.49	0.11	Passed	Strong Consensus

The results in Table 2 indicate that seven out of eight proposed factors successfully achieved the required consensus threshold. The factor "Quality and Competence of Tutors/ Facilitators" (F2) recorded the highest median score (M = 4.92) and the lowest dispersion level (SD = 0.28), indicating a very strong level of agreement among the expert panel. High median values were also recorded for "Synchronization of Central and Regional NFE Policies" (F1), "Availability of Sustainable Operational Funds" (F3), and "Relevance of the Curriculum to the Local Job Market" (F4), each demonstrating relatively low variation among expert responses. Meanwhile, the factor "Regulation of Village Fund Allocation for NFE" (originally F7) recorded an SD value of 0.65, exceeding the established tolerance threshold. Consequently, this factor was excluded from subsequent modeling stages. The factor "Recognition and Accreditation of NFE Institutions" (previously coded as F8) remained valid and was recoded as F7 to maintain consistency in the sequential structural analysis.

Overall, the Delphi validation stage confirmed seven critical factors considered relevant for CB-NFE development in Indonesia, namely Policy Synchronization (F1), Tutor Quality and Competence (F2), Sustainable Operational Funds (F3), Curriculum Relevance (F4), DUDI Partnership (F5), Community Participation (F6), and Institutional Accreditation (F7). The relatively low dispersion values across most variables indicate a stable level of agreement among the participating experts.

Following the Delphi validation process, the seven validated factors were analyzed using Interpretive Structural Modeling (ISM) to identify hierarchical and causal relationships within the CB-NFE system. The ISM analysis generated Driving Power (DP) and Dependence Power (DEP) values for each factor, enabling the classification of variables according to their systemic roles and structural positions.

Table 3. Driving force and dependence of critical factors of CB-NFE

Critical Factors of CB-NFE	Code	DP	DEP
Synchronization of Central and Regional NFE Policies	F1	7	4
Quality and Competence of Educators/Tutors	F2	6	6
Sustainable Availability of Operational Funds	F3	6	4
Relevance of the Curriculum to Local Job Market Needs	F4	6	7
Solid Partnership with the Business and Industry World (DUDI)	F5	6	7
Level of Active Community Participation	F6	7	6
Level of Recognition and Accreditation of NFE Institutions	F7	3	7

Source: Data Processing Results with ISM Pro v2.0 Software

The data presented in Table 3 demonstrate that "Synchronization of Central and Regional NFE Policies" (F1) and "Active Community Participation" (F6) obtained the highest Driving Power values, each scoring 7. These factors occupied the foundational structural level within the system hierarchy. Factor F1 recorded a Dependence Power value of 4, while F6 obtained a DEP value of 6. Four additional factors—Tutor Quality (F2), Operational Funds (F3), Curriculum Relevance (F4), and DUDI Partnership (F5)—were positioned at the intermediate level of the hierarchy, each recording Driving Power values of 6 with varying Dependence Power values between 4 and 7. Meanwhile, "Recognition and Accreditation of NFE Institutions" (F7) recorded the lowest Driving Power value (DP = 3) and the highest Dependence Power value (DEP = 7), positioning it at the uppermost dependent level within the structural model.

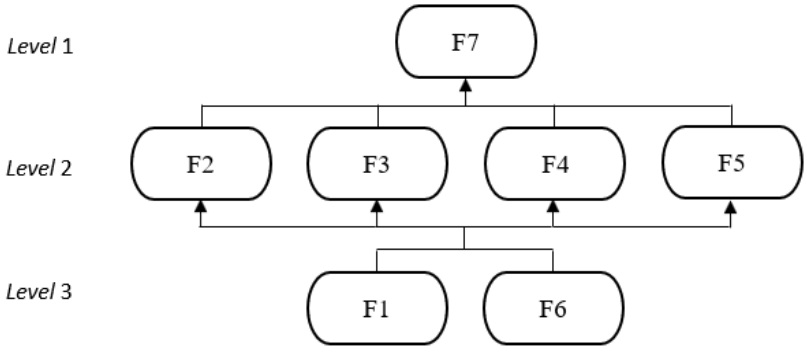

Figure 1. ISM Structural Model using ISM Pro v2.0 Software

Figure 1 illustrates the hierarchical structure generated from the ISM analysis. The structural model demonstrates the relationship between foundational driving factors, intermediate linkage variables, and outcome-oriented dependent variables within the CB-NFE system. Variables located at lower levels exhibit stronger systemic influence, while variables positioned at upper levels display higher dependency on preceding structural components.

To further identify the strategic characteristics of each factor, MICMAC analysis was conducted based on the Driving Power and Dependence Power values generated through the ISM process. The MICMAC classification categorized the validated factors into four quadrants according to their systemic influence and dependency relationships.

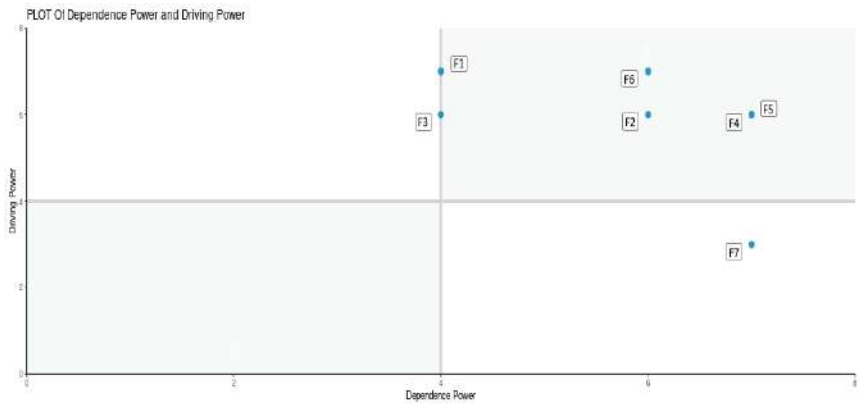

Figure 2. MICMAC Matrix Diagram using ISM Pro v2.0 Software

Figure 2 presents the distribution of factors across the MICMAC quadrants. The mapping indicates that factors with high driving influence and relatively low dependence occupy the Independent quadrant, while factors characterized by simultaneously high driving and dependence values are positioned within the Linkage quadrant. Factors with high dependence and relatively lower driving influence are grouped within the Dependent quadrant.

Table 4. Factor classification based on MICMAC analysis

Quadrant	Classification	Critical Factors	Characteristics (DP vs DEP)	Interpretation
Quadrant I	*Dependent* (Result)	F4, F5, F7	High DEP, Low DP	High dependency, low driving force.
Quadrant II	*Linkage*	F2, F6	High DEP, High DP	High dependency, high driving force.

Quadrant	Classification	Critical Factors	Characteristics (DP vs DEP)	Interpretation
Quadrant III	*Autonomous* (Independent)	Empty	Low DEP, Low DP	Factors that do not have a strong relationship.
Quadrant IV	*Independent* (Driver)	F1, F3	Low DEP, High DP	Strong driving force, systemic root causes.

The classification results in Table 4 show that "Synchronization of Central and Regional NFE Policies" (F1) and "Sustainable Availability of Operational Funds" (F3) were categorized within Quadrant IV as Independent or Driver factors. These variables demonstrated strong systemic influence with relatively lower dependency levels. Factors "Quality and Competence of Tutors/Facilitators" (F2) and "Active Community Participation" (F6) were classified within Quadrant II as Linkage variables, indicating that these factors simultaneously possessed high driving and dependence characteristics. Meanwhile, "Curriculum Relevance" (F4), "DUDI Partnership" (F5), and "Recognition and Accreditation of NFE Institutions" (F7) were positioned within Quadrant I as Dependent variables characterized by higher dependence levels. No variables were identified within Quadrant III (Autonomous factors).

The final stage of analysis employed the Analytic Network Process (ANP) to determine the relative priority of CB-NFE development strategies by incorporating interdependency and feedback relationships among variables. Pairwise comparisons conducted by the expert panel were evaluated using the Consistency Ratio (CR) to ensure reliability in the assessment process.

Table 5. Relative weight of criteria factors

Criteria Factors	Weight	Ranking
Synchronization of Central and Regional NFE Policies (F1)	0.75000	1
Sustainable Availability of Operational Funds (F3)	0.25000	2

Source: ANP data processing results with SuperDecision v3.2 software

The results in Table 5 indicate that "Synchronization of Central and Regional NFE Policies" (F1) emerged as the dominant criterion with a relative weight of 0.75000. In contrast, "Availability of Sustainable Operational Funds" (F3) obtained a relative weight of 0.25000. These values demonstrate the relative importance assigned by the expert panel to the primary criteria influencing CB-NFE development.

The supermatrix limit calculation subsequently generated global priority values for nine alternative CB-NFE development strategies.

Table 6. Global Priority Vectors of the CB-NFE Development Strategy

Ranking	Code	CB-NFE Development Strategy	Weight *(Global Vector)*
1	S4	NFE Tutor Professional Certification and Development Program	0.14642
2	S2	Utilization of Digital Technology (NFE Digitalization)	0.13516
3	S1	Comprehensive NFE Policy and Regulatory Reform	0.12235
4	S8	Improving Institutional Accreditation and Certification Standards	0.11879
5	S5	Strengthening Community Participation Mechanisms	0.10724
6	S6	Modular Curriculum Design Based on Industry Needs	0.10570
7	S7	Establishment of a National Inter-Tutor Network	0.10202
8	S3	Community Financial Governance Capacity Building	0.08636
9	S9	Development of a Structured DUDI Partnership Ecosystem	0.07596

Source: ANP Data Processing Results with SuperDecision v3.2 Software

The results presented in Table 6 indicate that the "NFE Tutor Professional Certification and Development Program" (S4) achieved the highest global priority value (0.14642). The "Utilization of Digital Technology (NFE Digitalization)" strategy (S2) ranked second with a weight of 0.13516, followed by "Comprehensive NFE Policy and Regulatory Reform" (S1) with a weight of 0.12235. Other strategies, including institutional accreditation improvement, strengthening community participation mechanisms, modular curriculum development, and national tutor network establishment, recorded global priority values ranging from 0.10202 to 0.11879. The "Development of a Structured DUDI Partnership Ecosystem" (S9) recorded the lowest global priority value at 0.07596.

The ANP results demonstrate a differentiated distribution of strategic priorities across the nine proposed interventions. The weighting structure indicates varying levels of strategic emphasis among policy, institutional, technological, and community-based development strategies within the CB-NFE system.

To provide an integrated overview of the sequential hybrid analysis, the major outputs generated from the Delphi, ISM, MICMAC, and ANP stages are summarized below.

Table 7. Results summary

Results Subsection	Key Parameters / Findings	Quantitative Data and Key Clamps
a. Hybrid Delphi	Validated Key Factors: Confirmed 7 factors	• Most Critical Factor: F2 (Tutor Quality) with Median (M) 4.92 and SD 0.28.

Results Subsection	Key Parameters / Findings	Quantitative Data and Key Clamps
Validation	out of 8 initial proposals.	• Dropped Factors: F7 (Village Funds) was eliminated due to high dispersion (SD 0.65).
b. Structural Modeling (ISM)	Hierarchy of Causality: Dividing factors into 3 systemic levels.	• Root Cause (Driver): F1 (Policy Synchronization) has the highest *Driving Power* (DP) of 7. • Final Result (Dependent): F7 (Accreditation) is at Level 1 with the highest *Dependence Power* (DEP) of 7.
c. MICMAC Classification	Strategic Grouping: Mapping factors into 4 quadrants.	• Driver Quadrant (IV): F1 and F3 (Operational Funds) as the driving engine of the system. • Linkage Quadrant (II): F2 and F6 (Community Participation) as sensitive factors.
d. Network Priority (ANP)	Global Strategy Weight: Assigns a ranking of 9 alternative strategies.	• Reliability: *Consistency Ratio* (CR) reaches 0.00000. • Top Priority: Strategy S4 (Tutor Certification) with the highest weight of 0.14642
e. Weighting Criteria	Determinants of Effectiveness: Comparison of the importance of the main criteria.	• Policy Dominance: F1 (Policy) is considered 3 times more important (weight 0.75000) than funds (F3, weight 0.25000).

Table 7 consolidates the principal findings from all analytical stages, including validated critical factors, structural hierarchy classifications, MICMAC quadrant mapping, and strategic priority rankings. The summary demonstrates a sequential analytical process beginning with factor validation, followed by structural relationship mapping, and concluding with the prioritization of CB-NFE development strategies based on systemic interdependencies and network weighting.

2. Discussion

The findings of this study demonstrate that the sustainability of Community-Based Non-Formal Education (CB-NFE) in Indonesia is shaped not only by the availability of educational programs or institutional support, but more fundamentally by the structural interaction between governance synchronization, operational funding stability, human capital capacity, and community participation. The hierarchical structure generated through ISM confirms that policy synchronization between central and regional governments (F1) functions as the primary structural driver within the CB-NFE ecosystem. This indicates that governance fragmentation and regulatory inconsistency remain the most influential

systemic constraints affecting the continuity of non-formal education programs. In decentralized governance systems, institutional effectiveness depends heavily on vertical coordination and policy harmonization across administrative levels. The placement of F1 at the foundational level with the highest Driving Power value demonstrates that the stability of downstream educational programs cannot be separated from the consistency of upstream governance arrangements (Imtikhanah et al., 2025; Yanto et al., 2025).

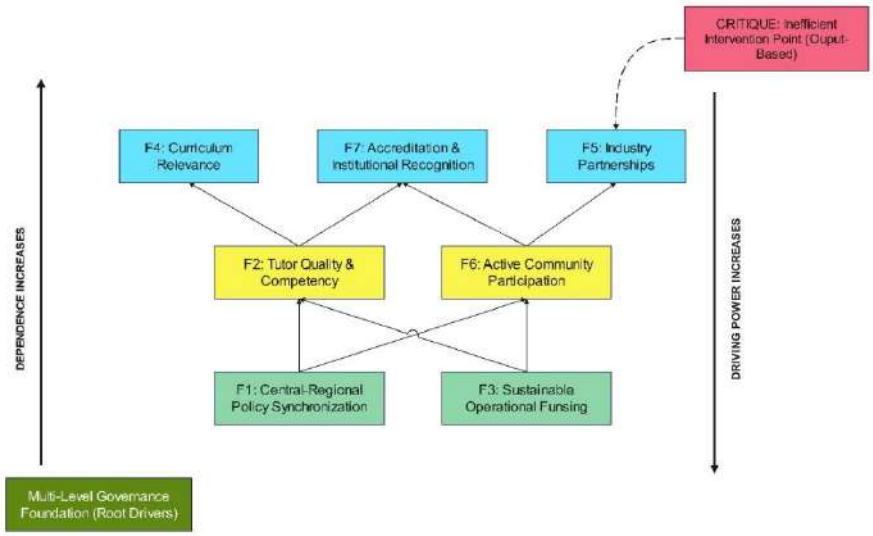

Figure 3. ISM hierarchical model: Structural causality & multi-level governance (Source: Author's data processing)

The structural hierarchy also reveals that operational funding (F3) occupies a strategic position as a supporting driver that directly influences the continuity of curriculum implementation, institutional activities, and tutor development. This finding confirms that CB-NFE sustainability is strongly dependent on the availability of stable operational resources rather than temporary project-based interventions. In many cases, fragmented funding mechanisms create institutional instability that limits long-term planning capacity and reduces the effectiveness of local educational programs (Marks & Spekkink, 2025; Storonyanska et al., 2025). Within this structure, policy synchronization and operational funding function as interconnected enabling mechanisms that determine whether educational interventions can operate consistently at the implementation level.

However, the ANP findings reveal a more complex pattern that cannot be explained through a purely linear governance perspective. Although policy synchronization (F1)

emerged as the dominant structural criterion, the strategy that achieved the highest global priority was not direct regulatory reform, but rather the Tutor Certification and Professional Development Program (S4). This result indicates the presence of a non-linear prioritization pattern within the CB-NFE system. Structural drivers do not automatically become the most effective intervention points. Instead, the findings show that human capital operates as the primary transmission mechanism through which policy and institutional support are translated into operational educational outcomes.

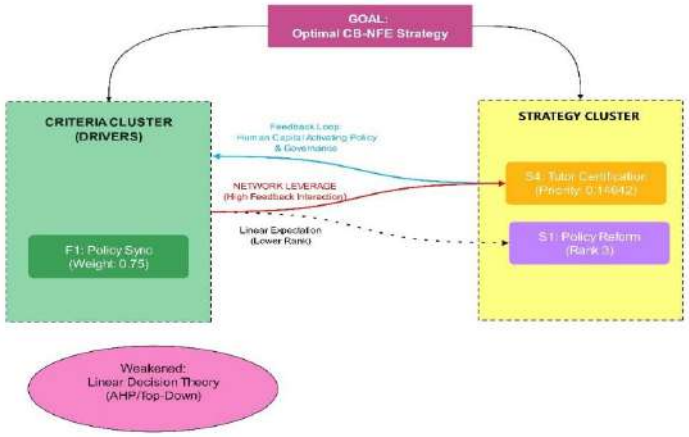

Figure 4. Non-linearity of priorities: Human capital as a systemic leverage (Source: Author's data processing)

The prominence of tutor development strategies reinforces the central role of Human Capital Theory within non-formal education systems (Auerbach & Green, 2025; Donaldson & Firestone, 2021; Shodipe & Ogbuanya, 2024). Tutors function not merely as technical instructors, but as operational intermediaries connecting policy structures, curriculum implementation, community participation, and learning outcomes. The findings demonstrate that strengthening tutor competence produces broader systemic influence because tutors directly mediate educational delivery at the grassroots level. In this context, regulatory reform alone becomes insufficient if the operational capacity of educational actors remains weak. This finding extends previous studies that primarily focused on administrative reform or institutional restructuring by demonstrating that investments in human agency can generate faster and wider systemic effects than isolated bureaucratic interventions (Cotronei-Baird et al., 2023; Forsyth & Roberts, 2025; Rincon-Gallardo, 2025).

At the same time, the positioning of Community Participation (F6) as a high-driving linkage variable demonstrates that CB-NFE sustainability cannot rely exclusively

on formal institutional mechanisms. Community participation functions as an operational stabilizer that supports the continuity and legitimacy of educational programs at the local level. The findings indicate that trust, local networks, and participatory engagement operate as structural resources that strengthen institutional resilience within decentralized education systems. This finding aligns with Social Capital Theory, which emphasizes that social cohesion and collective participation contribute significantly to institutional sustainability and adaptive capacity (Caferra et al., 2023; Carmen et al., 2022; Martínez-Martínez et al., 2025).

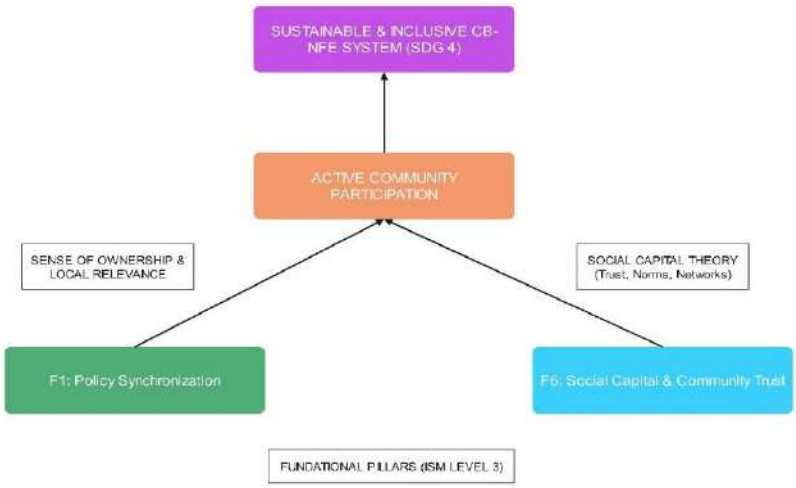

Figure 5. Academic dialogue: Social capital framework
(Source: Author's data processing)

The interaction between policy synchronization, tutor professionalism, and community participation demonstrates that CB-NFE development operates through an interconnected governance network rather than through isolated administrative mechanisms. This finding is important because previous CB-NFE studies often treated governance, human resources, curriculum relevance, and institutional participation as separate dimensions. In contrast, the present study shows that these components operate simultaneously within a dynamic network structure where changes in one factor influence the performance of others. The integration of Delphi, ISM, MICMAC, and ANP therefore contributes not only methodologically, but also conceptually, by revealing the structural interdependencies that shape educational sustainability in decentralized contexts.

The findings also provide a critical response to the limitations of conventional linear decision-making approaches frequently used in educational policy formulation.

Traditional approaches such as top-down administrative planning or linear weighting models often assume that interventions targeting root-level governance automatically generate the highest impact (Gilead & BenDavid-Hadar, 2025; Van Der Steen et al., 2013). However, the present study demonstrates that systemic effectiveness depends not only on identifying structural roots, but also on identifying the operational mechanisms capable of transmitting policy effects throughout the system. Without strengthening intermediary actors such as tutors, policy reforms may remain administratively formal without producing substantive transformation at the implementation level (Asim et al., 2023; Roland, 2015; Trinidad, 2025).

The study therefore introduces an important conceptual contribution by positioning tutors as strategic leverage actors within the governance network of CB-NFE. Unlike previous approaches emphasizing institutional compliance or administrative restructuring, this study demonstrates that strengthening the operational capacity of core actors generates more responsive and adaptive educational systems (Castelnovo & Sorrentino, 2024; Trinidad, 2025). This finding shifts the focus of educational development from output-oriented administrative indicators toward the strengthening of systemic transmission capacity. In this context, accreditation, institutional recognition, and partnership expansion become dependent outcomes rather than primary intervention priorities.

The practical implications of these findings are particularly relevant for policymakers operating in decentralized governance systems. The results suggest that improving CB-NFE sustainability requires policy reorientation from fragmented output-based interventions toward integrated system architecture approaches. Institutional accreditation and curriculum standardization remain important, but their effectiveness depends heavily on governance stability, funding continuity, tutor competence, and community participation operating simultaneously within the system. Consequently, policy interventions that focus exclusively on administrative indicators without strengthening operational transmission mechanisms are likely to produce limited long-term impact (Brown & Fowlin, 2022; Gamede et al., 2025).

The prioritization of tutor professional development also provides an important strategic alternative under conditions of limited fiscal capacity. While large-scale bureaucratic reform often requires extensive institutional coordination and long implementation periods, investments in tutor competence can produce more immediate operational effects across multiple educational dimensions simultaneously (Cuéllar et al.,

2025; Youmans & Godden, 2022). In this regard, tutor development functions as a practical leverage mechanism capable of strengthening curriculum delivery, improving community trust, and increasing institutional responsiveness without requiring complete structural transformation at the initial stage.

Beyond the Indonesian context, these findings carry broader implications for non-formal education systems across the Global South. Many developing countries continue to face governance fragmentation, unequal resource distribution, institutional instability, and limited administrative coordination within lifelong learning systems (Dadang et al., 2026). The hybrid Delphi–ISM–ANP framework developed in this study offers a replicable analytical model for identifying structural drivers, interrelated mechanisms, and strategic intervention priorities within similarly complex governance environments. Therefore, this study contributes to broader discussions on educational governance, community-based learning systems, and the implementation of SDG 4 by demonstrating the importance of integrating governance analysis with network-based strategic modeling (Rogers, 2019; Assakayeva et al., 2025).

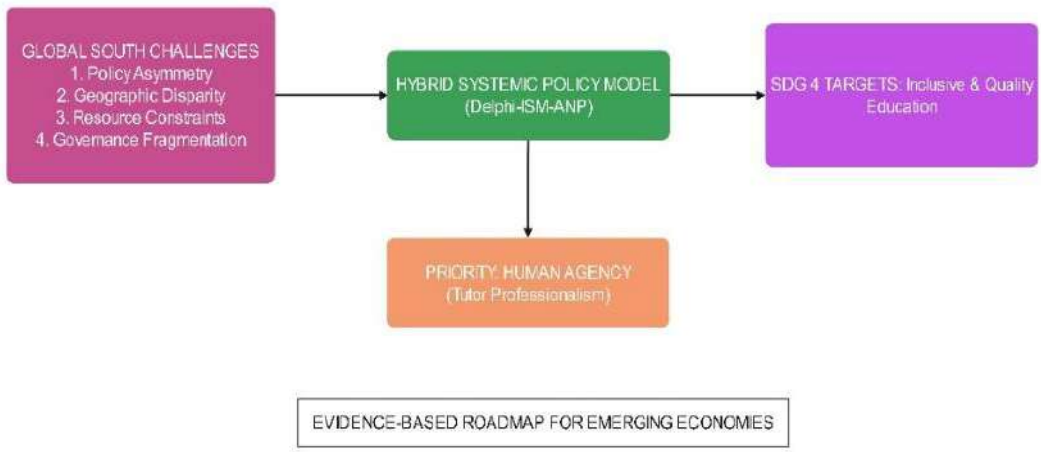

Figure 6. Global implications: The systemic transformation roadmap
(Source: Author's data processing)

The global relevance of these findings also lies in their contribution to ongoing debates concerning effective resource allocation within education systems constrained by institutional limitations. This study demonstrates that strengthening human agency through tutor professionalism can generate greater systemic leverage than isolated investments in formal regulatory reform or infrastructure expansion alone (Fadlilah et al.,

2026; Rogers, 2019; Muhaemin et al., 2021). These findings are particularly relevant for countries seeking to expand inclusive lifelong learning systems under conditions of administrative asymmetry and limited financial resources. The integration of governance synchronization, human capital strengthening, and community participation represents a strategic pathway for developing more adaptive and sustainable non-formal education ecosystems in developing regions (Toshtemirova et al., 2025; Kosim et al., 2025; Rogers, 2019; Assakayeva et al., 2025).

Despite the methodological robustness of the hybrid Delphi–ISM–ANP framework, several limitations should be acknowledged. *First,* the structural hierarchy and priority weighting generated in this study were derived from expert-based assessments involving 12 participants, meaning that the findings reflect collective expert judgments rather than large-scale operational datasets. *Second,* the binary structure of ISM limits the analysis to the identification of the presence or absence of relationships between variables without measuring the magnitude of causal influence. These limitations should be considered when interpreting the structural relationships identified within the CB-NFE system.

D. Conclusion

The findings of this study demonstrate that the sustainability of Community-Based Non-Formal Education (CB-NFE) in Indonesia is determined not only by the availability of educational programs or institutional regulations, but more fundamentally by the interaction between governance synchronization, operational funding stability, human capital capacity, and community participation within a systemic educational network. The study confirms that policy synchronization between central and regional governments functions as the principal structural driver shaping the effectiveness of the CB-NFE ecosystem. However, the results also reveal that the most influential strategic leverage does not lie solely in direct regulatory reform, but in strengthening tutor professionalism through certification and professional development programs. This finding indicates that the effectiveness of educational policy depends heavily on the operational capacity of core actors who translate formal policy support into practical learning processes at the community level.

The study contributes conceptually by extending the integration of Multi-Level Governance, Human Capital, and Social Capital perspectives within a network-based policy framework for non-formal education. Rather than viewing educational development as a

linear administrative process, this research demonstrates that CB-NFE sustainability emerges through interconnected relationships among governance structures, institutional resources, human agency, and local participation. The hybrid Delphi–ISM–ANP framework also contributes methodologically by providing a systematic approach for identifying structural drivers, mapping interdependencies, and prioritizing strategic interventions in complex educational systems. Practically, the findings offer strategic implications for policymakers seeking to strengthen community-based lifelong learning systems in decentralized governance contexts, particularly in developing countries facing governance fragmentation and resource limitations.

Considering the limitations acknowledged in this study, future research should focus on empirical validation using larger operational datasets and statistical modeling approaches such as Structural Equation Modeling (SEM) to examine the strength of causal relationships among variables. Further studies may also adopt Fuzzy-ANP to accommodate uncertainty and variation in expert judgment within complex educational decision-making environments. Expanding the scope of analysis across different regional and institutional contexts would also strengthen the generalizability of the proposed framework.

Ultimately, this study emphasizes that the transformation of CB-NFE into an inclusive, adaptive, and sustainable lifelong learning system cannot rely exclusively on formal regulatory reform or administrative standardization. Sustainable educational change requires the strengthening of operational actors, governance coherence, and community-based institutional resilience as interconnected foundations within the broader educational ecosystem.

Acknowledgment

Thank to LPPM Universitas Islam Negeri Madura, this research was carried out thanks to the collaboration and Grant of LPPM UIN Madura with SKEMA number B-1776/In.38/R/PP.00.9/05/2025.

Declaration of Competing Interests

The authors declare that they have no known competing financial or non-financial interests that could have appeared to influence the work reported in this paper.

Declaration of Generative AI Use

During the preparation of this manuscript, the authors used [Quillbot and Grammarly] to improve the clarity and readability of the text. Output generated by the tool were

carefully reviewed and edited by the authors, who take full responsibility for the content of this article. All substantive intellectual contributions, including conceptualization, analysis, interpretation of data, and final decisions regarding content, arguments, and conclusions, were carried out solely by the authors. The authors take full responsibility for the integrity, originality, and academic quality of this article.

Bibliography

Alshameri, R. G. A., Nasser, A. A., Abdullah, A. H., Alghawli, A. S. A., & Elsayed, A. A. K. (2025). Toward Effective Educational Supervision in Yemen: A Hybrid Fuzzy Delphi and Clustering Analysis of Technical Barriers. *F1000Research*, *14*, 956. https://doi.org/10.12688/f1000research.167498.1

Ario Bismo, P., Elmir, M. B., & Fitriah, A. (2024). the Urgency of Deregulation to Manifest a Single National Education System as Mandated in Constitution. *Iblam Law Review*, *4*(1), 14–25. https://doi.org/10.52249/ilr.v4i1.224

Asim, M., Mundy, K., Manion, C., & Tahir, I. (2023). The "Missing Middle" of Education Service Delivery in Low- and Middle-Income Countries. *Comparative Education Review*, *67*(2), 353–378. https://doi.org/10.1086/724280

Assakayeva, D., Adanov, K., Belgibayev, R., & Morkhova, I. (2025). Pedagogical Design for Integrating Formal and Non-Formal Learning: Insights from a TLS-Based CPD Model in a Resource-Constrained Context. *Education Sciences*, *15*(12), 1662. https://doi.org/10.3390/educsci15121662

Auerbach, P., & Green, F. (2025). Reformulating the Critique of Human Capital Theory. *Journal of Economic Surveys*, *39*(5), 1839–1851. https://doi.org/10.1111/joes.12675

Bhandari, A., & Bhuyan, M. N. H. (2023). Social Capital and Capital Allocation Efficiency. *Journal of Business Finance & Accounting*, *50*(7–8), 1439–1466. https://doi.org/10.1111/jbfa.12662

Bida, O. (2021). Kebijakan Desentralisasi dan Disparitas Pendidikan Lokal di Provinsi Sulawesi Tenggara. *Jurnal Ilmu Administrasi Negara ASIAN (Asosiasi Ilmuwan Administrasi Negara)*, *9*(1), 228–248. https://doi.org/10.47828/jianaasian.v9i1.59

Brown, S. G., & Fowlin, J. M. (2022). Open Systems, Closed Interventions? A Way Forward Requires Systems Thinking. *Industrial and Organizational Psychology*, *15*(1), 95–98. https://doi.org/10.1017/iop.2021.138

Caferra, R., Colasante, A., D'Adamo, I., Morone, A., & Morone, P. (2023). Interacting Locally, Acting Globally: Trust and Proximity in Social Networks for the Development of Energy Communities. *Scientific Reports*, *13*(1), 16636. https://doi.org/10.1038/s41598-023-43608-7

Carmen, E., Fazey, I., Ross, H., Bedinger, M., Smith, F. M., Prager, K., McClymont, K., & Morrison, D. (2022). Building Community Resilience in a Context of Climate Change: The Role of Social Capital. *Ambio*, *51*(6), 1371–1387. https://doi.org/10.1007/s13280-021-01678-9

Castelnovo, W., & Sorrentino, M. (2024). Agency in Multi-Level Governance Systems: The Implementation Puzzle and the Role of 'Intelligent' Local Implementers. *Public Policy and Administration*, *39*(3), 457–474. https://doi.org/10.1177/09520767231185651

Cotronei-Baird, V. S., Chia, A., Paladino, A., & Johnston, A. (2023). Examining the Influence of Professional Development on Tutors' Teaching Philosophies. *Higher Education Research & Development*, *42*(6), 1338–1361. https://doi.org/10.1080/07294360.2022.2146060

Cuéllar, C., Horn, A., González, Á., & Queupil, J. P. (2025). Winds of Change? Understandings about Capacity-Building among Actors in the Public Education System in Chile. *Professional Development in Education*, *51*(1), 119–134. https://doi.org/10.1080/19415257.2024.2441836

Dadang, D. Y. L., Irnawati, H., Shantini, Y., Hatimah, I., & Khan, A. (2026). Governance of Community Learning Centers in Indonesia: A Systematic Literature Review. *Journal of Nonformal Education*, *12*(1), 124-134. https://doi.org/10.15294/jone.v12i1.41504

DesJardine, M. R., & Wang, Z. (2025). When Managers Stay, Workers Are Safer: Rethinking the Value of Firm-Specific Human Capital. *Journal of Management*, 01492063251358215. https://doi.org/10.1177/01492063251358215

Donaldson, M. L., & Firestone, W. (2021). Rethinking Teacher Evaluation using Human, Social, and Material Capital. *Journal of Educational Change*, *22*(4), 501–534. https://doi.org/10.1007/s10833-020-09405-z

Fadlilah, Chaniago, F., Farwati, S., Fitriani, S., & Takriyanti, R. (2026). Strategic Islamic Value-Based Conflict Management in Pesantren: A Model for Strengthening Dormitory Culture and Multicultural Character. *Munaddhomah*, *7*(2), 354–370. https://doi.org/10.31538/munaddhomah.v7i2.2589

Forsyth, M., & Roberts, A. (2025). Insiders and Outsiders: The Role of Human Agents and Networks in System Change. *Regulation & Governance*, *19*(4), 1074–1085. https://doi.org/10.1111/rego.12645

Gamede, N., Munsamy, M., & Telukdarie, A. (2025). Unpacking Key Systems Towards a Sustainable Education Ecosystem. *Sustainability*, *18*(1), 282. https://doi.org/10.3390/su18010282

Garg, R., Chhikara, R., Kataria, A., & Agrawal, G. (2026). Exploring the Drivers and Barriers to the Non-Formal Education in Anganwadi Centers for Sustainable Development Education: A Multiple Stakeholder Study. *International Journal of Inclusive Education*, *30*(1), 1–25. https://doi.org/10.1080/13603116.2024.2368043

Gilead, T., & BenDavid-Hadar, I. (2025). Educational Justice and Formula Funding: A Complex Adaptive Systems Perspective. *Educational Philosophy and Theory*, *57*(12), 1078–1089. https://doi.org/10.1080/00131857.2025.2494584

Green, J. E., & Koebele, E. A. (2025). Coordinating School Improvement: Understanding the Impact of State Implementation Approach on Coordination in Multilevel Governance Systems. *Review of Policy Research*, *42*(2), 188–211. https://doi.org/10.1111/ropr.12612

Habib, Md. R., Chowdhury, A. R., & Uldanov, A. (2024). Creating Pathways to Opportunity: Non-formal Educational 'Inclusion' for Rohingya Refugee Children in Bangladesh. *Journal of South Asian Development*, *19*(1), 61–82. https://doi.org/10.1177/09731741231202872

Hafid, A., Rapanna, P., Radja, M. J., Sahban, H., & Muhyina, M. (2024). The Role of Non-Formal Education in Building Socio-Economic Independence in Indonesia. *International Journal of Management Studies and Social Science Research*, *6*(3), 205–215. https://doi.org/10.56293/IJMSSSR.2024.5024

Hanafi, A., Gobel, L. V., & Bakari, L. (2025). Pengawasan Penyelenggaraan Pusat Kegiatan Belajar Masyarakat (PKBM) oleh Bidang Pendidikan Nonformal (PNF) Dinas Pendidikan dan Kebudayaan Kabupaten Gorontalo. *Journal of Governance and Public Administration*, *2*(4), 844–864. https://doi.org/10.70248/jogapa.v2i4.2882

Ifenthaler, D., Majumdar, R., Gorissen, P., Judge, M., Mishra, S., Raffaghelli, J., & Shimada, A. (2024). Artificial Intelligence in Education: Implications for Policymakers, Researchers, and Practitioners. *Technology, Knowledge and Learning*, *29*(4), 1693–1710. https://doi.org/10.1007/s10758-024-09747-0

Imtikhanah, S., Astari, & Fitrayudi, M. (2025). Flypaper Effect of General Allocation Funds and Regional Revenue in Central Java-Indonesia. *Ratio: Reviu Akuntansi Kontemporer Indonesia*, *6*(2), 14–23. https://doi.org/10.30595/ratio.v6i2.26025

Jailani, M., Indrojiono, Fx., Anwar, H., & Irwandi, I. (2025). Community Participation in the Application of Educational Policies to Improve Learning Outcomes in Rural Areas. *Asian Journal of Applied Education (AJAE)*, *4*(3), 267–276. Https://Doi.Org/10.55927/Ajae.V4i3.14757

Kalenda, J., Kočvarováa, I., & Boeren, E. (2023). Impact of COVID -19 on Participation and Barriers in Nonformal Adult Education in the Czech Republic. *European Journal of Education*, *58*(4), 681–698. https://doi.org/10.1111/ejed.12580

Kosim, M., Kustati, M., Farid, H. M., Waeno, M., Sirait, W. R., & Fajri, S. (2025). Tolerance Education in Muslim Minority Educational Institutions in Cambodia, Thailand, and Indonesia. *Jurnal Pendidikan Agama Islam*, *22*(1), 235–254. https://doi.org/10.14421/jpai.v22i1.11101

Knudsen, E. S., & Lien, L. B. (2023). The Half-Life of Knowledge and Strategic Human Capital. *Human Resource Management Review*, *33*(4), 100989. https://doi.org/10.1016/j.hrmr.2023.100989

Loganathan, T., Ong, Z. L., Hassan, F., Chan, Z. X., & Majid, H. A. (2023). Barriers and Facilitators to Education Access for Marginalised Non-Citizen Children in Malaysia: A Qualitative Study. *PLOS One*, *18*(6), e0286793. https://doi.org/10.1371/journal.pone.0286793

Margeviča-Grinberga, I., & Kalēja, A. (2025). Job Shadowing Adults' Non-Formal Education Programme Through Social-Emotional Learning. *Frontiers in Sociology*, *10*, 1524922. https://doi.org/10.3389/fsoc.2025.1524922

Marks, P., & Spekkink, W. (2026). Activity Systems Modelling as a Complex Systemic Approach to Develop Learning Partnerships between Community Initiatives and Municipal Governments. *Systems Research and Behavioral Science*, *43*(2), 616-628. https://doi.org/10.1002/sres.3200

Martínez-Martínez, P. R., Ramos-Soto, A. L., Cruz-Domínguez, E., Palacios-Pineda, F., & Valadez-Solana, B. D. (2025). Social Capital and Sustainable Development in Community Contexts: Evidence from Beekeepers in Southern Mexico. *Sustainability*, *17*(24), 11102. https://doi.org/10.3390/su172411102

Maulida, S., & Juwono, V. (2025). Integrating Population Education within Multilevel Governance in Indonesia: A Systematic Literature Review. *Administratio*, *16*(1), 85-100. https://doi.org/10.23960/administratio.v16i1.484

Muhaemin, M., Gaffar, S. B., & LATIF, M. (2021). Assessment of Educational and Training Needs of Non-formal Education Tutors in Makassar City. *SCIREA Journal of Education*, *6*(4), 114-129. https://doi.org/10.54647/education88270

Müller, R., Alix-Séguin, C., Alonderienė, R., Bourgault, M., Chmieliauskas, A., Drouin, N., Ke, Y., Minelgaite, I., Pilkienė, M., Šimkonis, S., Unterhitzenberger, C., Vaagaasar, A. L., Wang, L., & Zhu, F. (2024). A (Meta) Governance Framework for Multi-Level Governance of Inter-Organizational Project Networks. *Production Planning & Control*, *35*(10), 1043–1062. https://doi.org/10.1080/09537287.2022.2146018

Ningrum, S., Dwiputri, D. A., Agus, R., Fazarani, F., & Roseline, H. (2025). Policy Harmony or Dissonance? Investigating Alignment in Indonesia's Multi-Level Governance System. *Journal of Ecohumanism*, *3*(8). https://doi.org/10.62754/joe.v3i8.5741

Nurhaliza, W. O. S., Sarwoprasodjo, S., Fatchiya, A., & Suharjito, D. (2025). Rethinking Education for Sea Nomads through the on–off School Model: A Perspective on Holistic and Culturally Adaptive Schooling for the Bajo People in Indonesia. *Frontiers in Communication*, *10*, 1611083. https://doi.org/10.3389/fcomm.2025.1611083

Quezada, L. E., López-Ospina, H., González, M. Á., Oddershede, A., & Palominos, P. (2024). Identifying Causal Relationships in a Strategy Map Using ANP and Multi-Objective Integer Optimization Model. *International Journal of Information Technology & Decision Making*, *23*(03), 1261–1299. https://doi.org/10.1142/S0219622023500396

Rahman, Md. M., Shindaini, A. J. M., & Husain, T. (2022). Structural Barriers to Providing Basic Education to Rohingya Children in the Kutupalong Refugee Camp, Cox's Bazar, Bangladesh. *International Journal of Educational Research Open*, *3*, 100159. https://doi.org/10.1016/j.ijedro.2022.100159

Ramdhan, M. (2025). PKBM'S Contribution to Improving the Quality of Non-Formal Education in Cianjur. *Jurnal ASIK: Jurnal Administrasi, Bisnis, Ilmu Manajemen & Kependidikan*, *3*(2), 1-11. https://doi.org/10.59639/asik.v3i2.99

Rincon-Gallardo, S. (2025). Supporting the Development of Teachers as Expert Learners: Lessons on Professional Learning from Large Scale Pedagogical Innovations in Mexico and Colombia. *Professional Development in Education*, *51*(1), 167–178. https://doi.org/10.1080/19415257.2024.2438777

Rogers, A. (2019). Second-Generation Non-Formal Education and the Sustainable Development Goals: Operationalising the SDGs Through Community Learning Centres. *International Journal of Lifelong Education*, *38*(5), 515–526. https://doi.org/10.1080/02601370.2019.1636893

Roland, D. (2015). Proposal of a Linear Rather than Hierarchical Evaluation of Educational Initiatives: The 7Is Framework. *Journal of Educational Evaluation for Health Professions*, *12*, 35. https://doi.org/10.3352/jeehp.2015.12.35

Shantini, Y., & Sudiapermana, E. (2016). Study of Nonformal and Informal Education Policy Toward Professionalism Education Services for Community. *Proceedings of the 1st UPI International Conference on Sociology Education (UPI ICSE 2015)*. 1st UPI International Conference on Sociology Education. https://doi.org/10.2991/icse-15.2016.49

Shin, M., Park, H., & Kang, E. Y. (2025). Development of Education Policies and Practices for Students with Learning Disabilities in South Korea Using Delphi Surveys and Topic Modeling. *Learning Disability Quarterly*, *48*(1), 13–25. https://doi.org/10.1177/07319487241280393

Shodipe, O. T., & Ogbuanya, C. T. (2024). Building Aspiring Teachers' Capabilities, Professional and Skill Development: Auspice to Quality Teaching Practice in Technical Vocational Education and Training Institutions. *European Journal of Education*, *59*(3), e12677. https://doi.org/10.1111/ejed.12677

Sinnema, C., Hannah, D., Finnerty, A., & Daly, A. (2022). A Theory of Action Account of an Across-School Collaboration Policy in Practice. *Journal of Educational Change*, *23*(1), 33–60. https://doi.org/10.1007/s10833-020-09408-w

Storonyanska, I., Benovska, L., Patytska, K., Ivashko, O., & Chulipa, I. (2025). Redesigning Sustainable Vocational Education Systems to Respond to Global Economic Trends and Labor Market Demands: Evidence from EU Countries on SDGs. *Sustainability*, *17*(21), 9530. https://doi.org/10.3390/su17219530

Sukari, S., & Ahmadi, F. (2024). Menilik Tantangan dan Strategi Pendidikan Luar Sekolah Berbasis Masyarakat. *Tsaqofah*, *4*(6), 4087–4098. https://doi.org/10.58578/tsaqofah.v4i6.4103

Supriyanto, Imron, A., Maisyaroh, Muslihati, Syarif, I., Puspitasari, F. F., & Sulaiman, A. (2025). Social Practices of Students with Disabilities in Inclusive School: A Bourdieusian Analysis of Habitus, Capital, and Field. *Munaddhomah*, *6*(4), 635–649. https://doi.org/10.31538/munaddhomah.v6i4.2055

Toshtemirova, S., Koshanova, N., Khaydarova, Z., Ilmurodova, F., Sadullaeva, M., & Nurmukhammadova, D. (2025). Integrative Pedagogy and Didactic Models in Teaching History Through Islamic Education: Insights from Uzbekistan. *Jurnal Pendidikan Islam*, *11*(1), 63–76. https://doi.org/10.15575/jpi.v11i1.44967

Trinidad, J. E. (2025). Educational Change through Bureaucratic Effectiveness: The Role of Mid-level Networks. *Sociology of Education*, *98*(4), 337–357. https://doi.org/10.1177/00380407251340944

Tromp, R. E., & Datzberger, S. (2021). Global Education Policies Versus Local Realities. Insights from Uganda and Mexico. *Compare: A Journal of Comparative and International Education*, *51*(3), 356–374. https://doi.org/10.1080/03057925.2019.1616163

Van Der Steen, M., Van Twist, M., Fenger, M., & Cointre, S. L. (2013). Complex Causality in Improving Underperforming Schools: A Complex Adaptive Systems Approach. *Policy & Politics*, *41*(4), 551–567. https://doi.org/10.1332/030557312X655800

Vann, R., Rith, V., & Suyitno, S. (2025). Community-Based Social Education for Sustainable Development – An Indonesian Perspective on Collaborative Learning Models. *Journal Neosantara Hybrid Learning*, *3*(1), 10–19. https://doi.org/10.70177/jnhl.v3i1.2174

Wulandhari, N. B. I., Gölgeci, I., Mishra, N., Sivarajah, U., & Gupta, S. (2022). Exploring the Role of Social Capital Mechanisms in Cooperative Resilience. *Journal of Business Research*, *143*, 375–386. https://doi.org/10.1016/j.jbusres.2022.01.026

Xing, Q., Tan, H. P., & Gan, S. W. (2024). Constructing a Student Development Model for Undergraduate Vocational Universities in China using the Fuzzy Delphi Method and Analytic Hierarchy Process. *PLOS One*, *19*(3), e0301017. https://doi.org/10.1371/journal.pone.0301017

Yanto, A., Hikmah, F., Faisal, F., & Rahayu, D. P. (2025). Towards Improved Regulatory Efficiency: Reconstruction of Ministerial Regulations to Enhance Regulatory Reform in Indonesia. *Novum Jus*, *19*(1), 239–263. https://doi.org/10.14718/NovumJus.2025.19.1.9

Youmans, A., & Godden, L. (2022). The Coalition Model for Professional Development. *Teachers and Teaching*, *28*(3), 284–300. https://doi.org/10.1080/13540602.2022.2062716

Zaifullah, Z., Cikka, H., Kahar, M. I., Ismail, M. J., & Iskadar, I. (2023). Peran Pusat Kegiatan Belajar Masyarakat (PKBM) dalam Penyelenggaraan Pendidikan Nonformal di Era Society 5.0. *Innovative: Journal of Social Science Research*, *3*(2), 14539–14549. https://doi.org/10.31004/innovative.v3i2.2089

Zhang, P., Ma, S.-G., Zhao, Y.-N., & Cao, X.-Y. (2023). Analyzing Core Competencies and Correlation Paths of Emerging Engineering Talent in the Construction Industry—An Integrated ISM–MICMAC Approach. *Sustainability*, *15*(22), 16011. https://doi.org/10.3390/su152216011