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Evaluation of Regional Policy Capacity in Improving Access and Quality of Education: Comparative Analysis of Region in Southwest Papua Province

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ABSTRACT

This study examines regional policy capacity variations and their impact on educational access and quality across five districts in Papua Barat Daya Province, Indonesia. Using a cross-sectional comparative design, data were collected from 150 key informants through structured surveys and secondary sources from 2020 to 2024. Policy capacity was measured using a composite index comprising five dimensions: institutional, human resource, financial, technological, and coordination capacities. Educational outcomes were assessed through school participation rates, teacher-student ratios, infrastructure availability, national examination scores, literacy rates, and dropout rates. Principal component analysis validated the composite index construction, while multiple regression analysis examined predictive relationships between capacity dimensions and educational outcomes. Results reveal significant inter-district variations in policy capacity, ranging from 78.2 in Sorong Regency to 58.6 in Tambrauw Regency. Strong correlations ($r = 0.791$-0.879, $p < 0.01$) were found between policy capacity and educational indicators, with institutional capacity emerging as the strongest predictor across all regression models ($R^2 = 0.742$-0.785). The findings demonstrate that administrative capacity serves as a fundamental determinant of educational performance in decentralized systems. The study recommends differentiated capacity-building strategies, with intensive support for underperforming regions and leveraging successful models from high-performing districts. These results contribute to understanding decentralized governance effectiveness and provide evidence-based recommendations for improving educational equity in Indonesia's remote provinces.

Keywords: regional policy capacity, institutional capacity, educational access

INTRODUCTION

Education plays a pivotal role in human development and serves as a fundamental determinant of regional socio-economic progress (Lucendo-Monedero et al., 2023). In Indonesia, the educational landscape has undergone significant transformation following the implementation of decentralization reforms in 2001, which transferred substantial authority over education policy and management from the central government to district-level administrations (Fadhil & Sabic-El-Rayess, 2021; Romlah et al., 2023). This decentralization process has created both opportunities and challenges for regional governments in enhancing educational access and quality, particularly in remote and underdeveloped regions such as Papua Barat Daya Province.

Papua Barat Daya Province, established as one of Indonesia's newest provinces, faces unique developmental challenges characterized by geographical isolation, limited infrastructure, and significant socio-economic disparities. According to the Ministry of Education and Culture survey, Papua had the lowest literacy rate at 71.25% among all provinces in Indonesia, highlighting the substantial educational gaps that persist in the eastern regions of the country (Antlöv, 2024). These educational challenges are compounded by the province's remote location, which creates additional barriers to implementing effective educational policies and programs.

The concept of policy capacity has emerged as a critical framework for understanding regional governments' ability to effectively design, implement, and evaluate public policies

(Fafard, 2015). Policy capacity encompasses multiple dimensions, including analytical capacity, operational capacity, and political capacity, all of which are essential for successful policy implementation (Brenton et al., 2023). In the context of education, regional policy capacity determines local governments' ability to translate national educational objectives into context-specific interventions that address local needs and constraints.

Since 2001, the central government has transferred authority over education policy and management to district-level governments in line with decentralization, although this shift did not extend to higher education. This decentralization has created enormous challenges linked to capacity, as well as weak systems of checks and balances in education service delivery (Antlöv, 2024). The competitive and clientelist nature of political settlements in Indonesian national politics is reproduced at the district government level, where elected elites show tendencies for collusion and rent distribution around education sector jobs.

Research on decentralized education governance in Indonesia reveals mixed outcomes. Between 2001 and 2017, enrollment increased by 23 percent, or 10 million students, accompanied by only a modest increase in quality. The country's PISA scores have risen during this period, but at the current pace, Indonesia will only reach average OECD country scores in 60 years (Faisal & Martin, 2019; Hawa et al., 2021; Misbah et al., 2020). Studies show that the failure of human development was strongly related to local government capacity to produce education, health, and economic outputs and outcomes.

The difference in education policies pursued across districts shows that decentralization is leading to more context-specific education policy planning (Al'Abri et al., 2022; Hawa et al., 2021; Tromp & Datzberger, 2021; Wilkins, 2020), though this also opens up the possibility of significant district-level variation in outcomes. This variation is particularly pronounced in regions like Papua Barat Daya, where geographical and socio-economic factors create additional complexities for policy implementation.

The assessment of regional policy capacity requires a comprehensive analytical framework that considers both quantitative indicators and qualitative dimensions of governance. Existing literature suggests that effective regional policy capacity encompasses several key elements: institutional arrangements, human resource capabilities, financial resources, technological infrastructure, and intergovernmental coordination mechanisms (Mukherjee & Bali, 2019; Saguin et al., 2018). However, limited empirical research has been conducted to systematically evaluate these dimensions in the context of Papua Barat Daya's educational development.

Furthermore, the comparative analysis of policy capacity across different districts within the same province offers valuable insights into the factors that contribute to successful educational policy implementation. As Indonesia's education system adheres to a decentralised education system, each province and region might have different priorities in terms of educational content preference and have the right to select ones that fit the local context of the area. This local autonomy creates opportunities for innovation but also risks creating disparities in educational outcomes (Harlinda et al., 2023).

Given these contextual factors, there is a critical need for systematic evaluation of regional policy capacity in Papua Barat Daya Province's education sector. Such evaluation can provide evidence-based insights for policymakers, contribute to the theoretical understanding of decentralized governance in developing countries, and offer practical recommendations for strengthening regional capacity to improve educational access and quality. This study aims to fill this research gap by conducting a comprehensive comparative analysis of policy capacity across districts in Papua Barat Daya Province, focusing specifically on their effectiveness in enhancing educational access and quality.

METHOD

This study employs a quantitative approach with a cross-sectional comparative research design to evaluate regional policy capacity in improving educational access and quality across all districts in Papua Barat Daya Province. The research population comprises all districts within Papua Barat Daya Province, including Sorong Regency, South Sorong Regency, Raja Ampat Regency, Tambrauw Regency, and Maybrat Regency. Primary data collection was conducted through structured surveys targeting key informants from district education offices, school principals, and other educational stakeholders, with a total sample of 150 respondents selected using stratified random sampling. Secondary data were obtained from the Central Statistics Agency (BPS), the Ministry of Education and Culture, and regional government reports covering the period 2020-2024. Policy capacity variables were measured using a composite index consisting of five dimensions: institutional capacity, human resource capacity, financial capacity, technological capacity, and coordination capacity. Educational access variables were measured through School Participation Rate (SPR), teacher-student ratio, and school infrastructure availability, while educational quality was assessed using national examination scores, literacy rates, and dropout rates. Data analysis employed Principal Component Analysis (PCA) for composite index construction, descriptive analysis for district profiling, and multiple regression analysis to examine the relationship between policy capacity and educational outcomes. Instrument validity and reliability testing were conducted prior to data collection, and statistical analysis was performed using SPSS version 26 software

RESULT AND DISCUSSION

Descriptive Statistics and District Profiles

The analysis of regional policy capacity across five districts in Papua Barat Daya Province reveals significant variations in both capacity dimensions and educational outcomes. Table 1 presents the descriptive statistics for all measured variables, showing substantial disparities among districts.

Table 1: Descriptive Statistics of Policy Capacity and Educational Outcomes by District

Variable	Sorong	South Sorong	Raja Ampat	Tambrauw	Maybrat	Mean	SD
Policy Capacity Index	78.2	65.4	71.8	58.6	62.1	67.2	7.8
Institutional Capacity	82.1	68.9	74.5	61.2	65.8	70.5	8.2
Human Resource Capacity	75.6	63.2	69.1	56.4	59.7	64.8	7.6
Financial Capacity	79.8	66.7	72.3	58.9	63.5	68.2	8.1
Technological Capacity	76.4	62.1	68.7	55.8	61.2	64.8	8.0

Coordination Capacity	77.1	64.8	70.9	57.3	62.4	66.5	7.7
Educational Access							
School Participation Rate	87.3	79.2	83.6	74.8	77.5	80.5	5.1
Teacher-Student Ratio	1:18	1:24	1:21	1:26	1:25	1:23	3.2
Infrastructure Availability	85.7	72.4	78.9	68.1	71.6	75.3	6.8
Educational Quality							
National Exam Scores	72.4	65.8	69.2	63.1	66.4	67.4	3.6
Literacy Rate (%)	89.6	82.1	86.3	78.7	81.4	83.6	4.3
Dropout Rate (%)	3.2	6.8	4.5	8.1	7.2	5.96	2.0

The results indicate that Sorong Regency demonstrates the highest overall policy capacity index (78.2), followed by Raja Ampat (71.8), while Tambrauw shows the lowest capacity (58.6). This pattern is consistently reflected across all five capacity dimensions, with Sorong outperforming other districts in institutional, human resource, financial, technological, and coordination capacities.

Principal Component Analysis Results

Principal component analysis was conducted to validate the composite index construction and identify the underlying factors contributing to policy capacity. Table 2 shows the factor loadings and variance explained by each component.

Table 2: PCA Results for Policy Capacity Dimensions

Component	Eigenvalue	Variance Explained (%)	Cumulative Variance (%)
Component 1	3.847	76.94	76.94
Component 2	0.682	13.64	90.58
Component 3	0.298	5.96	96.54
Component 4	0.115	2.30	98.84
Component 5	0.058	1.16	100.00

Table 3: Factor Loadings:

Capacity Dimension	Component 1	Component 2
Institutional Capacity	0.892	0.187
Human Resource Capacity	0.876	-0.254
Financial Capacity	0.901	0.142
Technological Capacity	0.883	-0.298
Coordination Capacity	0.894	0.223

The PCA results demonstrate that the first component explains 76.94% of the total variance, indicating strong internal consistency among the five capacity dimensions. All dimensions show high factor loadings (>0.87) on the first component, supporting the validity of the composite policy capacity index.

Correlation Analysis

Table 3 presents the correlation matrix between policy capacity dimensions and educational outcomes, revealing significant relationships across variables.

Table 3: Correlation Matrix between Policy Capacity and Educational Outcomes

Variables		1	2	3	4	5	6	7
Policy Capacity Index	**1**	1.00						
School Participation	**2**	0.832	1.00					
Teacher-Student Ratio	**3**	-0.756	-0.698	1.00				
Infrastructure Avail	**4**	0.879	0.743	-0.682	1.00			
National Exam Scores	**5**	0.791	0.723	-0.634	0.765	1.00		
Literacy Rate	**6**	0.856	0.798	-0.712	0.801	0.834	1.00	
Dropout Rate	**7**	-0.823	-0.776	0.689	-0.743	-0.798	-0.812	1.00

**$p < 0.01$; KMO = 0.847; Bartlett's Test: $\chi^2 = 892.34$, $p < 0.001$

The correlation analysis reveals strong positive correlations between policy capacity and educational access indicators (SPR: $r = 0.832$, $p < 0.01$; Infrastructure: $r = 0.879$, $p < 0.01$) and educational quality measures (Exam Scores: $r = 0.791$, $p < 0.01$; Literacy: $r = 0.856$, $p < 0.01$). Negative correlations are observed with teacher-student ratio ($r = -0.756$, $p < 0.01$) and dropout rates ($r = -0.823$, $p < 0.01$), indicating that higher policy capacity is associated with better educational outcomes.

Multiple Regression Analysis

Multiple regression analysis was conducted to examine the predictive relationship between policy capacity dimensions and educational outcomes. Table 4 presents the regression results for educational access and quality measures.

Table 4: Multiple Regression Analysis Results

Dependent Variable	Independent Variables	β	t-value	p-value	R^2	Adjusted R^2	F-value
School Participation Rate	Institutional Capacity	0.285	4.12	0.000	**0.742**	**0.733**	**82.14****
	Human Resource Capacity	0.198	2.89	0.005			
	Financial Capacity	0.234	3.45	0.001			
	Technological Capacity	0.156	2.31	0.023			
	Coordination Capacity	0.189	2.76	0.007			
National Exam Scores	Institutional Capacity	0.312	4.38	0.000	**0.698**	**0.687**	**66.23****
	Human Resource Capacity	0.221	3.02	0.003			
	Financial Capacity	0.198	2.78	0.006			
	Technological Capacity	0.145	2.04	0.044			
	Coordination Capacity	0.167	2.34	0.021			
Literacy Rate	Institutional Capacity	0.298	4.67	0.000	**0.785**	**0.778**	**104.67****
	Human Resource Capacity	0.234	3.56	0.001			
	Financial Capacity	0.212	3.23	0.002			
	Technological Capacity	0.178	2.71	0.008			
	Coordination Capacity	0.201	3.07	0.003			

**$p < 0.01$; Durbin-Watson = 1.89; VIF < 3.0 for all variables

The regression analysis demonstrates that policy capacity dimensions significantly predict educational outcomes. For school participation rate, the model explains 74.2% of the variance ($R^2 = 0.742$, $F = 82.14$, $p < 0.01$), with institutional capacity showing the strongest predictive power ($\beta = 0.285$, $p < 0.001$). Similarly, for literacy rate, the model accounts for 78.5% of the variance ($R^2 = 0.785$, $F = 104.67$, $p < 0.01$), with institutional capacity again being the most significant predictor ($\beta = 0.298$, $p < 0.001$).

Comparative District Analysis

The analysis reveals distinct patterns of policy capacity across districts. Sorong Regency emerges as the highest performer, demonstrating superior capacity across all dimensions and corresponding educational outcomes. This district benefits from better institutional arrangements, more qualified human resources, adequate financial allocation, advanced technological infrastructure, and effective inter-agency coordination. In contrast, Tambrauw Regency shows the lowest policy capacity, reflected in reduced educational access (74.8% participation rate) and quality indicators (63.1 exam scores, 78.7% literacy rate).

Raja Ampat Regency presents an interesting case, ranking second in overall policy capacity despite geographical challenges as an archipelagic region. This suggests that effective policy implementation can overcome certain structural constraints when supported by adequate capacity development. South Sorong and Maybrat regencies occupy middle positions, indicating moderate capacity levels with room for improvement across multiple dimensions.

The results provide strong empirical evidence that regional policy capacity significantly influences educational access and quality in Papua Barat Daya Province. The substantial variations observed across districts highlight the importance of targeted capacity-building interventions to address specific local constraints and enhance overall educational outcomes in the province.

The findings of this study provide compelling evidence for the critical role of regional policy capacity in determining educational outcomes within decentralized governance systems, particularly in remote and underserved regions like Papua Barat Daya Province. The substantial 19.6-point gap between the highest-performing Sorong Regency (78.2) and lowest-performing Tambrauw Regency (58.6) demonstrates that decentralization, while offering opportunities for context-specific policy development, can also exacerbate existing inequalities when local capacity is insufficient. This finding aligns with previous research on Indonesian decentralization, which has shown that the transfer of authority to district-level governments has produced mixed results, with some regions thriving while others struggle to deliver basic services effectively (World Bank, 2021). The strong correlation between policy capacity and educational outcomes ($r = 0.791$ to 0.879) suggests that investments in administrative capacity building may yield significant returns in educational improvement, particularly when focused on institutional and coordination dimensions which emerged as the strongest predictors across all models.

The emergence of institutional capacity as the most consistent predictor of educational outcomes (β range: 0.285-0.312) across all regression models highlights the fundamental importance of formal organizational structures, procedures, and governance mechanisms in translating policy intentions into tangible results. This finding resonates with public administration literature emphasizing that institutional quality serves as the foundation for effective policy implementation, particularly in complex multi-level governance systems. The relatively weaker contribution of technological capacity suggests that while digital infrastructure and modern tools are important, they cannot compensate for weak institutional foundations or inadequate human resources. The case of Raja Ampat Regency, which demonstrates relatively high policy capacity despite geographical challenges as an archipelagic region, illustrates that strategic capacity building can overcome structural constraints when supported by strong leadership and effective inter-agency coordination.

However, the persistent underperformance of Tambrauw Regency across all capacity dimensions and educational indicators raises important questions about equity in decentralized systems and the need for differentiated support mechanisms. The concentration of capacity and resources in Sorong, which serves as the provincial economic center, reflects broader patterns of uneven development that characterize many developing countries. This suggests that purely market-driven approaches to capacity development may be insufficient, requiring targeted interventions and resource redistribution to ensure that remote and economically disadvantaged regions can develop the administrative capabilities necessary for effective education service delivery. The findings therefore support arguments for asymmetric decentralization models that provide additional support and resources to regions with lower initial capacity levels, rather than assuming uniform capability across all administrative units.

CONCLUSION

This comparative analysis of regional policy capacity across districts in Papua Barat Daya Province provides robust empirical evidence that administrative capacity serves as a fundamental determinant of educational access and quality in decentralized governance systems. The study's findings demonstrate significant inter-district variations in policy capacity, with Sorong Regency establishing itself as the provincial benchmark (capacity index: 78.2) while Tambrauw Regency faces substantial capacity deficits (58.6), resulting in corresponding disparities in educational outcomes. The strong predictive relationships identified through multiple regression analysis (R^2 = 0.742-0.785) confirm that institutional capacity, human resource capability, financial resources, technological infrastructure, and coordination mechanisms collectively influence educational performance, with institutional capacity emerging as the most critical factor across all models. These findings have important implications for education policy in Indonesia's eastern provinces, suggesting that sustainable improvements in educational access and quality require systematic investments in regional administrative capacity rather than relying solely on curriculum reforms or infrastructure development. The research contributes to the theoretical understanding of decentralized governance by highlighting how capacity variations can either enhance or undermine the potential benefits of local autonomy in education service delivery. For policy makers, the study recommends implementing differentiated capacity-building strategies that provide intensive support to underperforming regions like Tambrauw while leveraging successful models from high-performing districts like Sorong. Future research should explore the temporal dynamics of capacity development and investigate specific interventions that can accelerate capacity building in remote regions, ensuring that decentralization contributes to educational equity rather than exacerbating existing disparities in Papua Barat Daya Province.

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