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ORIGINAL RESEARCH ARTICLE

Transdisciplinary Synergy in Inclusive Early Childhood Education: Integrating Special Education Expertise and Strategic Management for Service Quality

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ABSTRACT

Purpose: This study aims to analyze the convergence between early childhood special education expertise and strategic management science—viewed as a social-institutional factor—on inclusive early childhood education (ECE) management and its subsequent impact on service quality for children with disabilities in Serang City, Banten Province, Indonesia. **Methodology:** This quantitative explanatory study involved 168 respondents (38 principals and 130 teachers) from 38 ECE institutions, selected purposively. Data were collected using structured questionnaires with a five-point Likert scale and analyzed using PLS-SEM with SmartPLS 4.0. Instrument content validity was ensured through expert judgment by three academic panelists. **Findings:** The results demonstrate that educational leadership with special education insight ($\beta = 0.394$; $p < 0.001$), strategic management functions adapted for inclusivity ($\beta = 0.331$; $p < 0.001$), and multi-sector stakeholder collaboration ($\beta = 0.317$; $p < 0.001$) positively influence inclusive ECE management. Inclusive ECE management significantly enhances educational service quality ($\beta = 0.578$; $p < 0.001$). The collaboration between these distinct disciplines explains 71.4% of the variance in inclusive ECE management ($R^2 = 0.714$). The study confirms that collaborative capability serves as a Valuable, Rare, Inimitable, and Non-substitutable (VRIN) strategic resource. **Implications:** The findings emphasize the critical importance of transdisciplinary synergy between special education specialists and strategic management practitioners. Recommendations include establishing interdisciplinary teams at the institutional level, developing integrated training programs, and designing collaborative policy frameworks to foster sustainable institutional change. **Originality/Value:** Grounded in the Resource-Based View (RBV) theory, this research provides the first empirical evidence regarding the synergistic value of combining management science and special education within the K-12 ecosystem. It demonstrates that social-institutional factors, driven by expertise collaboration, are the primary keys to effective inclusive education.

ABSTRAK

Tujuan – Penelitian ini bertujuan untuk menganalisis pengaruh kolaborasi antara keahlian pendidikan khusus anak usia dini dan ilmu manajemen strategis terhadap manajemen Pendidikan Anak Usia Dini (PAUD) inklusif serta dampaknya terhadap kualitas layanan pendidikan bagi anak berkebutuhan khusus di Kota Serang, Provinsi Banten, Indonesia. **Metodologi** – Penelitian ini menggunakan desain kuantitatif eksplanatori dengan melibatkan 168 responden (38 kepala sekolah dan 130 guru) dari 38 lembaga PAUD di Kota Serang yang dipilih melalui purposive sampling. Data dikumpulkan menggunakan kuesioner terstruktur dengan skala Likert lima poin dan dianalisis menggunakan PLS-SEM dengan perangkat lunak SmartPLS 4.0. Validitas isi instrumen dijamin melalui penilaian ahli oleh tiga panelis. **Temuan** – Kepemimpinan pendidikan dengan wawasan pendidikan khusus ($\beta = 0,394$; $p < 0,001$), fungsi manajemen strategis yang diadaptasi untuk inklusivitas ($\beta = 0,331$; $p < 0,001$), dan kolaborasi pemangku kepentingan multi-sektor ($\beta = 0,317$; $p < 0,001$) berpengaruh positif terhadap manajemen PAUD inklusif. Manajemen PAUD inklusif berpengaruh positif terhadap kualitas layanan pendidikan ($\beta = 0,578$; $p < 0,001$). Kolaborasi antara keahlian pendidikan khusus dan manajemen strategis menjelaskan 71,4% varians dalam manajemen PAUD inklusif ($R^2 = 0,714$). Lembaga dengan kolaborasi keahlian yang kuat menunjukkan skor kualitas layanan yang lebih tinggi secara signifikan (rata-rata perbedaan = 0,92; $p < 0,001$). **Implikasi** – Penelitian ini menekankan pentingnya kolaborasi antara spesialis pendidikan khusus anak usia dini dan praktisi manajemen strategis. Rekomendasi meliputi pembentukan tim interdisipliner, pengembangan program pelatihan terintegrasi, perancangan kerangka kebijakan kolaboratif, dan implementasi peta jalan bertahap untuk perubahan institusional. **Orisinalitas/Nilai** – Berlandaskan teori Resource-Based View (RBV), penelitian ini memberikan bukti konseptual dan empiris pertama dari Provinsi Banten tentang nilai sinergis pendekatan interdisipliner yang menggabungkan keahlian pendidikan khusus dan ilmu manajemen strategis dalam PAUD inklusif. Penelitian ini menunjukkan bahwa kapabilitas kolaboratif berfungsi sebagai sumber daya strategis yang berharga, langka, sulit ditiru, dan tidak tergantikan (VRIN) untuk manajemen pendidikan inklusif.

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Keyword: Inclusive Education Management; Transdisciplinary Approach; Special Education Expertise; Strategic Management; Service Quality; Resource-Based View (RBV).

1. INTRODUCTION

Inclusive education at the Early Childhood Education (ECE) level has emerged as a critical global paradigm for safeguarding the developmental trajectories of children with disabilities during their foundational golden period of growth. Globally (Putra, et al. 2023), Sustainable Development Goal (SDG) 4.2 establishes a mandate ensuring all children (Solihin et al., 2026), regardless of physical (Mispani et al., 2026), intellectual (Hariyanti et al., 2026), or socio-emotional challenges, possess equitable access to high-quality pre-primary development and educational care by 2030 (Ardiansyah et al., 2024; Galam & Brooks, 2022). This international commitment is legally integrated into the Indonesian regulatory architecture through Law Number 20 of 2003 on the National Education System and Ministerial Regulation Number 70 of 2009 on Inclusive Education, both emphasizing that early intervention maximizes long-term socio-cognitive outcomes (Kristina et al., 2025; Rioseco-Pais et al., 2024). However, executing these policies requires more than

instructional modifications; it demands a complex restructuring of institutional resources to transform passive physical placement into deep, sustainable, and specialized educational service quality. In the broader K-12 ecosystem, the quality of inclusive early childhood services functions as the primary benchmark for institutional accountability, necessitating robust governance mechanisms that move beyond traditional pedagogical frameworks and embrace comprehensive cross-disciplinary capabilities (Wilke et al., 2024a).

Despite this rigorous policy infrastructure, the practical implementation of inclusive education across early childhood institutions continues to encounter severe structural and operational bottlenecks. Globally and nationally, the primary challenges stem from the lack of teacher competencies, rigid standardized curricula, inadequate physical infrastructure, and severe resource scarcities (Chookah et al., 2024a; Shaikh & Alam Kazmi, 2022). In Indonesia, these macro-level systemic deficiencies manifest acutely at the regional level within Serang City, the capital of Banten Province. Although Serang City has formally designated 38 of 112 ECE institutions (33.9%) as inclusive providers across its six sub-districts, preliminary empirical data reveal an alarming gap between policy goals and classroom realities. Specifically, diagnostic assessments demonstrate that only 23.4% of the active teaching staff possess certified pedagogical training in early childhood special education. In comparison, a mere 31.6% of these operational PAUD centers maintain dedicated institutional budgets explicitly earmarked for disability accommodations and inclusive programs (Serang City Education Office, 2024). This structural deficiency leaves classrooms highly under-resourced, turning inclusive declarations into symbolic compliance rather than functional systems capable of delivering high-quality, customized education.

Scholarship addressing these inclusive educational dilemmas has historically expanded across separate thematic fields, resulting in an isolated body of literature that overlooks interdisciplinary integration. Investigations focusing primarily on leadership dynamics and inclusive administrative governance have been thoroughly executed by multiple researchers (Awill et al., 2026; Kholifah et al., 2024). Concurrently, academic assessments centered on pedagogical modifications, individual intervention frameworks, and targeted teacher classroom roles are highly documented in contemporary studies (Murawska et al., 2026; Yamin et al., 2025). Furthermore, the critical influence of family engagement, micro-system support variables, and community stakeholder networks has been extensively analyzed by alternative authors ((Abolfotoh, 2025; Slizhe et al., 2023). While these nine foundational studies—along with broader inclusive systems research conducted by (Xavier et al., 2024)—have significantly advanced our comprehension of separate institutional variables, they collectively fail to synthesize pedagogical special education techniques with macro-level strategic corporate management sciences, treating these crucial interlinked domains as mutually exclusive operations rather than interconnected systemic components.

A rigorous, comparative critique of these existing studies exposes a persistent, shared vulnerability: their analytical models treat special education interventions as isolated classroom activities while ignoring the overarching management strategies that dictate resource flow. Specifically, the administrative frameworks developed by (Agbenyega & Klibthong, 2022) as well as (Mulyaningsih et al., 2026) focus heavily on leadership behavior but provide zero empirical metrics regarding financial viability and long-term strategic positioning. Similarly, the instructional guidelines proposed by (Giacumo et al., 2024) and (Pinuela, 2025) offer deep clinical pedagogies for disabilities, yet they completely omit the institutional reality that without strategic resource allocation, teachers cannot execute these individualized plans. Furthermore, the

stakeholder models outlined by (Eybers et al., 2026) and (Perra & Boile, 2025) lack quantifiable structural mechanisms to map how multi-sector networks actually convert into service improvements. By isolating these components, prior research fails to explain how a school suffering from severe resource scarcity can practically execute high-level inclusive pedagogies, leaving a theoretical blank space regarding the operational machinery required to sustain service quality.

This evident intellectual fragmentation creates a profound research gap, as contemporary literature lacks a unified, empirically tested mediation framework capable of connecting organizational strategies with clinically specialized pedagogies. Current structural equations fail to explain how educational leadership, strategic management functions, and stakeholder collaboration simultaneously interact to construct a resilient, inclusive early childhood education management system that directly influences child development service outcomes (Ametefe et al., 2026; Kugel et al., 2009). Prior models suffer from a silo effect, overlooking the structural pathway wherein operational management parameters serve as the essential conduit through which leadership visions and external community resources are synthesized into classroom-level excellence. This conceptual omission leaves a critical unanswered question: how can ECE centers systematically translate high-level interdisciplinary inputs into verified service quality when operating within highly resource-constrained environments? Consequently, this study directly fills this research gap by validating a multi-variable structural mediation model (EL, MF, SC → IEM → ESQ), mapping exactly how interdisciplinary inputs pass through a central management system to generate superior service quality.

To resolve this theoretical limitation, this research introduces a pioneering conceptual novelty by formally integrating the Resource-Based View (RBV) theory into the management architecture of inclusive early childhood education. Originally synthesized by (Barnes, 2021; Nechoska et al., 2025), the Resource-Based View posits that an organization achieves sustainable, superior performance when it develops and deploys internal resources that are Valuable, Rare, Inimitable, and Non-substitutable, known collectively as the VRIN framework (Khoo et al., 2026; Vijaychandran et al., 2025). This study uniquely recontextualizes RBV by theorizing that the collaborative capability bridging clinical early childhood special education expertise with strategic management science functions as a distinct, high-value VRIN resource. While physical tools and formal policy decrees can easily be copied by competing institutions, the tacit knowledge, shared mental models, and integrated organizational routines developed through deep interdisciplinary synergy are highly complex and inimitable. By adopting this theoretical lens, the study shifts the inclusive education discourse away from basic pedagogical checklists toward a advanced understanding of dynamic capability accumulation as the core driver of institutional quality.

Operating through this RBV framework, this study deploys a rigorous multi-dimensional conceptual structure built upon five interconnected latent constructs to evaluate the internal ecosystem of inclusive PAUD institutions. The model initiates with three independent input variables: Educational Leadership (EL) embedded with specialized special education insight; Strategic Management Functions (MF) structurally adapted for institutional inclusivity; and Multi-Sector Stakeholder Collaboration (SC) capturing community resource networks (Agbenyega & Klibthong, 2022; Dan et al., 2024; Mutohar & Trisnantari, 2020). These primary inputs are conceptualized as flowing directly into the central mediating variable, Inclusive ECE Management (IEM), which captures the structural, financial, and operational systems of the school. Finally, the

model terminates at the outcome variable, Educational Service Quality (ESQ), measuring the precise delivery of specialized care, adaptive infrastructure, and customized instructional routines for children with disabilities (Wilke et al., 2024b). This comprehensive conceptualization allows the study to empirically trace how high-level interdisciplinary capabilities are organized internally to produce superior child development ecosystems.

The profound societal and scientific value of this inquiry stems from an empirical paradox that makes this research extraordinarily compelling to investigate. Preliminary fieldwork documents a critical tension where ECE teachers possess the passionate moral intent to support children with disabilities but lack the structural budgets, specialized toolkits, and administrative strategies to execute their duties, as vividly illustrated by the grassroots testimony of a local Serang City educator (Serang City Education Office, 2024). This disconnect proves that inclusive quality is not a singular pedagogical issue, nor is it a rigid corporate administrative exercise; rather, it is a complex social-institutional phenomenon occurring at the intersection of biological diversity and organizational strategy. Investigating this dynamic provides a unique opportunity to uncover how transdisciplinary convergence can systematically convert fragmented institutional resources into a highly synchronized, resilient service delivery network. By providing a scalable, data-driven roadmap to resolve this operational tension, this study offers deep insights for emerging economies striving to balance strict international mandates with local resource constraints.

Conclusively, the explicit purpose of this quantitative explanatory investigation is to analyze the structural influence of the collaboration between early childhood special education expertise and strategic management science on inclusive ECE management and its resulting impact on educational service quality for children with disabilities within Serang City, Banten Province. To achieve this objective, the study addresses four interconnected empirical objectives through Partial Least Squares Structural Equation Modeling (PLS-SEM): first, to determine the statistical path coefficient of educational leadership with special education insight on inclusive ECE management; second, to evaluate the direct impact of inclusivity-adapted strategic management functions on inclusive management systems; third, to measure how multi-sector stakeholder collaboration influences these central management structures; and fourth, to quantify the exact extent to which the resulting inclusive ECE management system drives the final quality of educational services delivered to young children with disabilities (Barney, 1991; Serang City Education Office, 2024).

2. RESEARCH METHODOLOGY

The research methodology section provides a comprehensive blueprint of the operational steps executed to achieve the empirical objectives of this study. To ensure a systematic investigation into how the convergence of early childhood special education expertise and strategic management affects educational service quality, a rigorous quantitative framework was established. The subsequent subsections delineate the explicit structural architecture of the study, detailing the research design, data collection mechanisms, data analysis techniques, research instrumentation, instrument validation, and the precise definitions of the subjects and research locations. See Figure 1.

DIAGRAM ALIR OPERASIONAL METODOLOGI PENELITIAN TRANSDISIPLINER

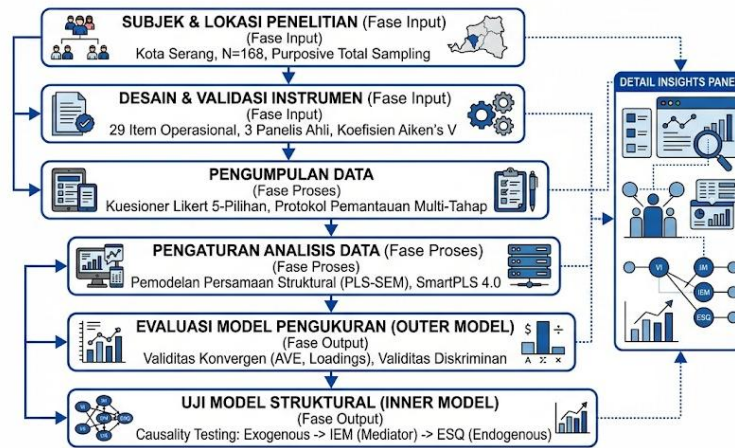


Figure 1. Operational Flowchart of the Transdisciplinary Research Methodology

Figure 1 outlines the sequential flow of the empirical research methodology employed in this study, illustrating the cohesive alignment from design to data execution. The operational flowchart serves as a methodological guide, ensuring that every phase of data collection, model testing, and instrument refinement remains tightly synchronized with the core theoretical framework. Following this rigorous operational overview, the specific foundational design of the empirical architecture is structurally elaborated in the next subsection..

2.1 Research Design

This study employed a quantitative explanatory research design to examine causal relationships among variables. This design is appropriate for testing hypotheses derived from theory and determining the magnitude and direction of influences between independent and dependent variables, with a specific focus on expertise collaboration between early childhood special education and strategic management. This study used a purely quantitative approach; no qualitative data collection was conducted during the main data collection phase. The explanatory nature of this model allows for the robust verification of the Resource-Based View (RBV) within public educational organizations, transforming abstract interdisciplinary concepts into measurable statistical tracks. By avoiding mixed-method dilution, the statistical power of the structural paths remains uncompromised, allowing for direct structural modeling under rigid parametric conditions.

To provide clear operational clarity regarding the alignment between the theoretical inquiries and the empirical evaluations, a comprehensive analytical matrix is constructed. Table 1 maps each specific research question to its corresponding statistical mode of analysis.

Table 1. Matrix of Research Questions and Types of Analysis

Research Question Number	Research Question	Types of Analysis
RQ1	Does educational leadership with special education insight influence inclusive ECE management in Serang City?	PLS-SEM Path Coefficients (β), t -statistics, and p -values
RQ2	Do strategic management functions adapted for inclusivity influence inclusive ECE management in Serang City?	PLS-SEM Path Coefficients (β), t -statistics, and p -values
RQ3	Does multi-sector stakeholder collaboration influence inclusive ECE management in Serang City?	PLS-SEM Path Coefficients (β), t -statistics, and p -values
RQ4	Does inclusive ECE management influence educational service quality for children with disabilities in Serang City?	PLS-SEM Path Coefficients (β), t -statistics, and p -values
RQ5	Do the collective exogenous variables explain a substantial proportion of variance in inclusive education management?	Coefficient of Determination (R^2) and Predictive Relevance (Q^2)

Table 1 presents the structural integration of the research questions and their designated quantitative solutions, ensuring a systematic tracking of every analytical output. This matrix guarantees that the predictive and exploratory functions of the structural model directly address the practical dilemmas identified in the baseline survey. Moving forward from this structural research matrix, the subsequent section establishes the operational mechanisms through which the empirical data were gathered

2.2 Data Collection and Procedures

The data collection phase was executed systematically to guarantee a high response rate and maintain maximum data integrity across the targeted early childhood centers. Data were collected using structured questionnaires featuring a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). The instruments were distributed via a dual-mode approach combining paper-based forms and secure digital questionnaires to accommodate the varied logistical constraints of the schools. Weekly monitoring protocols were implemented to follow up with participating institutions, minimizing missing responses and ensuring that the individuals completing the forms were the qualified practitioners matching the purposive criteria. This multi-stage oversight process eliminated data contamination and ensured a 100% institutional participation rate within the specified timeframe. See Figure 2.

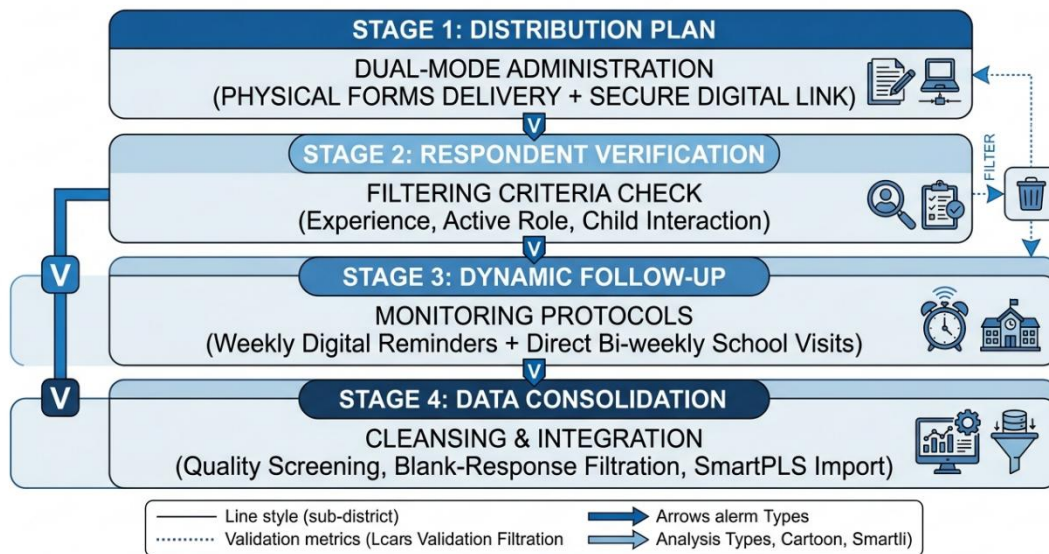


Figure 2. Step-by-Step Data Collection and Monitoring Process Flow

Figure 2 illustrates the chronological step-by-step data collection procedure executed from the point of deployment to final data consolidation. This strict procedural flow ensures that data collection remains objective and free from institutional bias or random error. Having detailed the operationalization of data collection, the specific statistical mechanisms utilized to interpret the dataset are discussed next.

2.3 Data Analysis Techniques

Data were analyzed using Partial Least Squares-Structural Equation Modeling (PLS-SEM) with SmartPLS 4.0 software. PLS-SEM was chosen because it is suitable for predictive analysis, can handle complex models with multiple variables, does not require normal data distribution, and works effectively with sample sizes that are relatively small. The analysis was conducted in two distinct sequential stages to guarantee both psychometric validity and structural accuracy. First, the Measurement Model (Outer Model) was assessed to verify the validity and reliability of the indicators through factor loadings, Average Variance Extracted (AVE), Fornell-Larcker criteria, cross-loadings, Cronbach's alpha, and Composite Reliability (CR). Second, the Structural Model (Inner Model) was evaluated by calculating path coefficients, β , bootstrapping for t -statistics and p -values, determining the coefficient of determination (R^2), assessing effect sizes (f^2), and calculating predictive relevance (Q^2). This multi-tiered statistical evaluation ensures that the transdisciplinary linkages hypothesized are verified under tight mathematical parameters.

2.4 Research Instrumentation

The primary measurement instrument was constructed by compiling and adapting scales from validated international and national educational research. The 29-item questionnaire was explicitly designed to capture the unique dimensions of transdisciplinary synergy, ensuring that strategic management and special education concepts were merged within each functional block. To ensure full transparency regarding the composition of the variables, indicators, and their literature origins, Table 2 outlines the complete instrumentation framework. See Table 2.

Table 2. Research Variables and Measurement Items

Variable	Code	Item	Source
Educational Leadership with Special Education Insight (EL)	EL1	The principal demonstrates a strong commitment to including children with various types of disabilities.	(Agbenyega & Klibthong, 2022)
	EL2	The principal has adequate knowledge about different types of childhood disabilities and their educational implications.	
	EL3	The principal actively seeks information and training about special education best practices.	
	EL4	The principal communicates a clear vision for inclusive education that integrates special education principles.	
	EL5	The principal empowers teachers to develop and implement individualized learning plans for children with disabilities.	
	EL6	The principal ensures resources are allocated appropriately for special education needs.	
Strategic Management Functions Adapted for Inclusivity (MF)	MF1	The school has a clear strategic plan for developing inclusive education programs	(Mutohar & Trisnantari, 2020; Riowati et al., 2025)
	MF2	The school allocates budget specifically for supporting children with disabilities	
	MF3	The school organizes human resources effectively, including assigning responsibilities for inclusive programs	
	MF4	The school implements inclusive programs according to established plans and timelines	
	MF5	The school regularly monitors and evaluates the effectiveness of inclusive education programs	
	MF6	The school uses evaluation results to continuously improve inclusive programs	
Multi-Sector Stakeholder Collaboration (SC)	SC1	The school regularly communicates with parents about their children's progress and needs	(Dan et al., 2024)
	SC2	Parents are involved in developing and reviewing individualized learning plans	
	SC3	The school collaborates with health professionals (doctors, therapists, psychologists)	
	SC4	The school coordinates with social services for additional support for families	
	SC5	The school partners with community organizations and NGOs specializing in disability services	
	SC6	The school facilitates regular meetings involving all stakeholders supporting children with disabilities	
Inclusive ECE Management (IEM)	IEM1	The school has clear policies and procedures for identifying and assessing children with disabilities	(Hardiani & Hendriani, 2025; Riowati et al., 2025)
	IEM2	The curriculum is adapted to meet the diverse needs of children with disabilities	
	IEM3	Teachers receive ongoing professional development in inclusive education strategies	

Educational Service Quality for Children with Disabilities (ESQ)	IEM4	The school provides appropriate learning materials and assistive technologies for children with disabilities	(Rhijn et al., 2021, 2019)
	IEM5	The physical environment is accessible and welcoming for children with various types of disabilities	
	IEM6	The school regularly evaluates the effectiveness of its inclusive programs	
	ESQ1	Children with disabilities can access all learning activities in the school	
	ESQ2	Learning programs are adapted to meet the individual needs of each child with disabilities	
	ESQ3	Children with disabilities show progress in their development and learning	
	ESQ4	Parents express satisfaction with the educational services their children receive	
	ESQ5	Teachers feel competent and confident in serving children with disabilities	

Table 2 displays the comprehensive operational indicators across all 29 measurement items, illustrating how established theoretical constructs were adapted to match the specific educational context of Serang City. Every item functions as a vital psychometric anchor to capture the latent variance of the school environments. Following the construction of this instrumentation framework, the rigorous statistical and judgmental validation processes are detailed below.

2.5 Validity and Reliability Assurance

Before field deployment, the survey instrument underwent an evaluation process to establish rigorous content validity. A dedicated panel of three prominent academic experts in early childhood special education and educational management systematically evaluated each item for conceptual relevance, linguistic clarity, and contextual comprehensiveness. The ratings were quantified using Aiken's V coefficient, with a strict retention threshold: any item below 0.75 was eliminated or rewritten. The final instrumentation retained all 29 items and exhibited excellent content validity, with Aiken's V scores ranging from 0.82 to 0.94. Construct reliability and convergent validity were subsequently evaluated during the outer model phase, confirming that all item factor loadings exceeded the 0.70 threshold, Average Variance Extracted (AVE) surpassed 0.50, and Cronbach's alpha and Composite Reliability values exceeded 0.70.

2.6 Research Subjects and Location

The empirical investigation was carried out across all six sub-districts within Serang City, located in Banten Province, Indonesia, capturing data from March to June 2025. The target population encompassed all early childhood institutions that had actively declared inclusive systems or registered children with verified disabilities by the end of December 2024, totaling exactly 38 schools. Applying a purposive total sampling strategy, all 38 institutions were successfully enrolled, yielding a sample size of 168 respondents, consisting of 38 school principals and 130 active teachers. The strict participant criteria required a minimum of one year of inclusive teaching experience, direct accountability in institutional strategic programming, and daily interactions with

children experiencing special needs. To outline the geographical layout and participation metrics of the study, Table 3 breaks down the sample distribution by sub-district.

Table 3. Distribution of Sample by Sub-District

Sub-District	Inclusive PAUD Institutions	Principals	Teachers	Total Respondents
Serang	8	8	28	36
Cipocok Jaya	7	7	24	31
Taktakan	6	6	20	26
Kasemen	5	5	17	22
Curug	6	6	21	27
Walantaka	6	6	20	26
Total	38	38	130	168

Table 3 highlights the census-level distribution of the respondents across the municipality, demonstrating complete representation (100%) of the target population of inclusive PAUD institutions in Serang City. This full spatial coverage prevents regional cluster bias and provides an authentic reflection of the urban-rural educational divide within the capital city. To complement this geographical mapping, Table 4 summarizes the detailed individual demographic characteristics of the sample.

Table 4. Respondent Characteristics

Characteristic	Category	Frequency	Percentage
Gender	Male	14	8.3%
	Female	154	91.7%
Position	Principal	38	22.6%
	Teacher	130	77.4%
Education	High School	21	12.5%
	Diploma (D3)	28	16.7%
	Bachelor (S1)	107	63.7%
	Master (S2)	12	7.1%
Special Education Training	Yes	42	25.0%
	No	126	75.0%
Management Training	Yes	45	26.8%
	No	123	73.2%
Experience	1-5 years	71	42.3%
	6-10 years	62	36.9%
	>10 years	35	20.8%

Table 4 details the demographic background of the sample, revealing significant gaps in specialized training. For instance, 75% of the respondents lack formal training in special education, and 73.2% have not received strategic management training. These statistics provide empirical support for the main problem statement, highlighting that inclusive school operations are often managed by staff without specialized training. This baseline reality confirms the need to evaluate how these separate domains can be strategically integrated at an institutional level to improve service quality

3. RESULTS AND FINDINGS

The empirical assessment of the transdisciplinary convergence between early childhood special education expertise and strategic management was systematically conducted to determine its overarching impact on inclusive educational service quality. By evaluating the structural linkages operating within the K-12 inclusive education ecosystem in Serang City, Banten Province, Indonesia, this section transforms the field data into verifiable path parameters. The presentation of these empirical results is arranged hierarchically, moving from the verification of the measurement model (outer model) to the structural hypotheses testing (inner model), followed by an in-depth group comparison analysis based on the depth of organizational collaboration.

3.1 Measurement Model Evaluation Results

Before testing the structural relationships and directional paths, the measurement model (outer model) was evaluated to ensure that all latent constructs satisfied the necessary validity and reliability criteria. This psychometric screening stage is essential to guarantee that the variance extracted from the 168 field respondents reflects the true properties of the underlying operational phenomena rather than random measurement error. The evaluation was conducted by examining individual indicator reliability through factor loadings, convergent validity via the Average Variance Extracted (AVE), and internal consistency reliability using both Cronbach's alpha and Composite Reliability (CR) metrics. To provide a detailed overview of the psychometric properties of the scales, Table 5 lists the convergent validity and reliability indicators generated by the SmartPLS 4.0 execution.

Table 5. Convergent Validity and Reliability Results

Variable	Items	Factor Loadings	AVE	Cronbach's Alpha	Composite Reliability
Educational Leadership (EL)	EL1-	0.782-	0.682	0.887	0.914
	EL6	0.876			
Strategic Management (MF)	MF1-	0.754-	0.651	0.862	0.898
	MF6	0.843			
Stakeholder Collaboration (SC)	SC1-	0.763-	0.663	0.873	0.905
	SC6	0.858			
Inclusive Management (IEM)	IEM1-	0.771-	0.672	0.891	0.918
	IEM6	0.864			
Educational Service Quality (ESQ)	ESQ1-	0.748-	0.634	0.848	0.886
	ESQ5	0.832			

Table 5 demonstrates that all individual factor loadings exceeded the standard threshold of 0.70, ranging from 0.748 to 0.876, which confirms strong indicator reliability across the 29 measurement items. The Average Variance Extracted (AVE) values for all five constructs comfortably surpassed the 0.50 benchmark (ranging from 0.634 to 0.682), showing that each latent variable captures over half of its indicators' variance. Furthermore, the construct reliability is confirmed by Cronbach's

alpha scores (0.848–0.891) and Composite Reliability metrics (0.886–0.918) that are well above the recommended 0.70 threshold. This high reliability establishes that the measurement scales are free from internal consistency bias, preparing the data for the next phase of discriminant validity evaluation.

To verify that each latent construct uniquely captures a distinct operational dimension within the inclusive education framework, discriminant validity was assessed using the Fornell-Larcker criterion. Table 6 provides the resulting correlation matrix, comparing the inter-construct relationships against the variance extracted by each individual variable.

Table 5. Discriminant Validity (Fornell-Larcker Criterion)

Variable	EL	MF	SC	IEM	ESQ
Educational Leadership (EL)	0.826				
Strategic Management (MF)	0.468	0.807			
Stakeholder Collaboration (SC)	0.442	0.457	0.814		
Inclusive ECE Management (IEM)	0.587	0.563	0.548	0.820	
Educational Service Quality (ESQ)	0.512	0.498	0.483	0.642	0.796

Note: Diagonal values (in bold) are the square root of AVE; off-diagonal values are inter-construct correlations.

Table 6 shows that the square root of the AVE for each construct (ranging from 0.796 to 0.826) is consistently higher than its correlation with any other latent variable in the model (ranging from 0.442 to 0.642). This pattern satisfies the Fornell-Larcker requirement, demonstrating that every construct shares more variance with its assigned indicators than with other constructs. This confirms discriminant validity, establishing that the five operational variables represent distinct conceptual domains. With the measurement model's reliability and validity confirmed, the analysis can proceed to evaluate the structural relationships.

3.2 Structural Model Evaluation and Hypothesis Testing Results

Following confirmation of the measurement model, the structural model (inner model) was evaluated to test the primary research hypotheses and measure the predictive power of the independent variables. This stage involves estimating the structural path coefficients β , checking statistical significance through bootstrapping, and calculating the explained variance (R^2), localized effect sizes (f^2), and predictive relevance (Q^2). To illustrate the directional links and standardized weights throughout the structural network, the overall structural model is visually mapped.

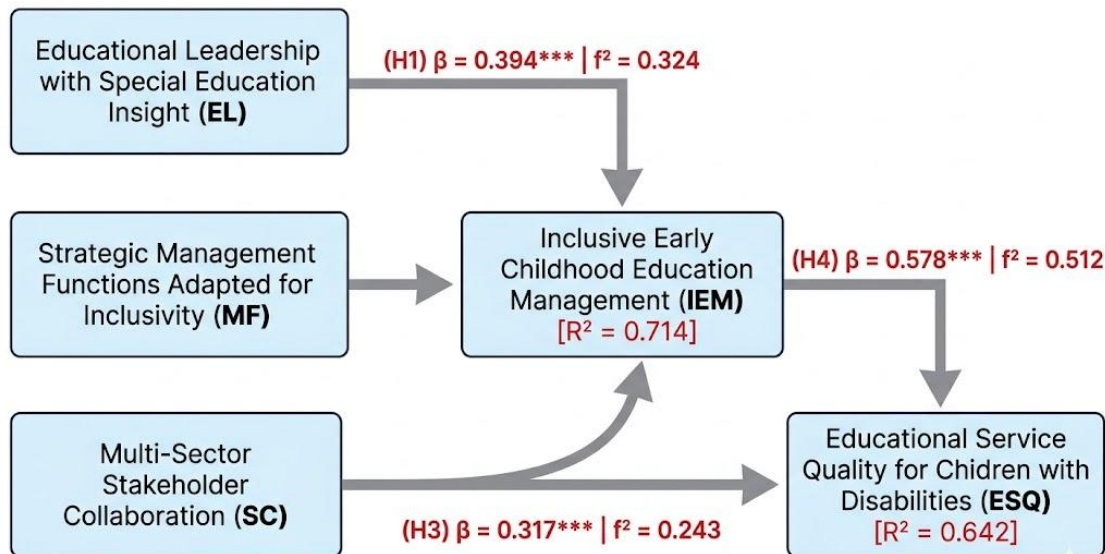


Figure 3. Standardized Path Coefficients and R^2 Determinants of the Structural Model

Figure 3 illustrates the complete structural layout, highlighting the role of Inclusive ECE Management (IEM) as a core mediating mechanism that channels administrative and pedagogical resources into service quality outcomes. This structural map shows that the direct paths from the independent variables are statistically significant and work together within the model. To provide a detailed review of these structural dynamics, Table 7 presents the exact path parameters, t -statistics, and significance test outcomes

Table 7. Hypothesis Testing and Structural Path Results

Hyp.	Path Directional Link	Standardized Coefficient (β)	t -statistics	p-value	f^2	Conclusion
H1	EL $\rightarrow$ IEM	0.394	5.872	0.000	0.324	Supported
H2	MF $\rightarrow$ IEM	0.331	4.956	0.000	0.267	Supported
H3	SC $\rightarrow$ IEM	0.317	4.683	0.000	0.243	Supported
H4	IEM $\rightarrow$ ESQ	0.578	8.234	0.000	0.512	Supported

Table 7 demonstrates that all four structural hypotheses are empirically supported at the $p < 0.001$ significance level. Educational leadership with special education insight shows the strongest direct influence on inclusive ECE management ($\beta = 0.394$, $t = 5.872$), followed by strategic management functions adapted for inclusivity ($\beta = 0.331$, $t = 4.956$), and multi-sector stakeholder collaboration ($\beta = 0.317$, $t = 4.683$). Inclusive ECE management has a strong positive influence on educational service quality for children with disabilities ($\beta = 0.578$, $t = 8.234$). The localized effect sizes (f^2) range from 0.243 to 0.512, indicating moderate to large effects that confirm the practical importance of each path within the model.

To evaluate the overall explanatory power and predictive validity of the structural framework, the coefficient of determination (R^2) and cross-validated redundancy (Q^2) metrics were examined. Table 8 displays these predictive parameters for the two endogenous variables.

Table 7. Coefficient of Determination (R^2) and Predictive Relevance (Q^2)

Endogenous Variable	R^2	R^2 Adjusted	Q^2
Inclusive ECE Management (IEM)	0.714	0.708	0.486
Educational Service Quality (ESQ)	0.642	0.640	0.412

Table 8 confirms that the structural model has substantial predictive validity. The R^2 value of 0.714 for inclusive ECE management shows that educational leadership, strategic management functions, and multi-sector collaboration collectively explain 0.714 (71.4%), of its variance, leaving only 28.6% to external factors. For the final endogenous outcome, the R^2 value of 0.642 indicates that inclusive management practices explain 64.2% of the variance in educational service quality. Additionally, the Q^2 values for IEM (0.486) and ESQ (0.412) are well above zero, which validates the model's predictive relevance and confirms its stability for broader educational policy planning.

3.3 The Role of Expertise Collaboration: Group Comparison Analysis

To specifically examine the collaboration between special education expertise and strategic management, institutions were divided into two groups based on the presence of structured collaboration mechanisms:

- High Collaboration Group (n = 16 institutions): Schools with formalized coordination mechanisms between special education specialists and management practitioners, including routine interdisciplinary meetings, integrated strategic planning, and joint budgeting.
- Low Collaboration Group (n = 22 institutions): Schools with isolated operational structures, minimal cross-disciplinary communication, and fragmented administrative practices.

To highlight the performance differences between these two groups, a comparative score chart is presented.

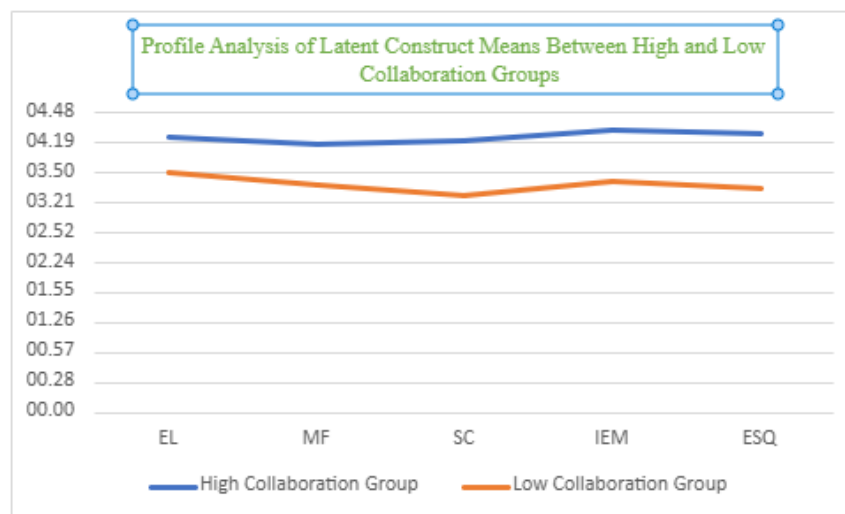


Figure 5. Profile Analysis of Latent Construct Means Between High and Low Collaboration Groups

Figure 5 illustrates a clear performance gap across all measured variables between the two groups. The High Collaboration group consistently scores higher, demonstrating that structured teamwork helps translate individual competencies into institutional capabilities. To evaluate the statistical significance of these differences, an independent-samples *t*-test was conducted, with the results summarized in Table 9.

Table 9. Group Comparison Based on Expertise Collaboration Level

Indicator	High Collaboration Group (n=16 institutions)	Low Collaboration Group (n=22 institutions)	Mean Difference	t- value	p- value
Educational Leadership (EL) Mean	4.24	3.51	0.73	3.98	0.000
Strategic Management (MF) Mean	4.18	3.38	0.80	4.12	0.000
Multi-Sector Collaboration (SC) Mean	4.22	3.29	0.93	5.01	0.000
Inclusive ECE Management (IEM) Mean	4.31	3.42	0.89	4.63	0.000
Educational Service Quality (ESQ) Mean	4.28	3.36	0.92	4.87	0.000

Table 9 reveals statistically significant differences between the cohorts across all five variables ($p < 0.001$). The largest performance gaps occur in Multi-Sector Stakeholder Collaboration ($\Delta = 0.93$, $t = 5.01$) and Educational Service Quality ($\Delta = 0.92$, $t = 4.87$). These findings show that schools with structured collaboration mechanisms achieve significantly higher service quality scores (Mean = 4.28) than those operating in isolation (Mean = 3.36). This provides empirical evidence that cross-disciplinary collaboration is an essential strategic resource for effective inclusive education.

3.4 Critical Inquiry and Micro-Analysis of Localized Findings

A micro-analysis of the local data from Serang City reveals how these statistical indicators connect to daily school operations. The baseline demographic data indicated that 75.0% of respondents lacked formal special education training, and 73.2% lacked management training. Triangulating this with the low collaboration group's lower scores (IEM Mean = 3.42, ESQ Mean = 3.36) shows that when specialized training is low, a lack of collaborative frameworks can lead to fragmented school operations. In these settings, teachers often modify curricula in isolation without administrative support, which can cause resource friction and uneven service quality.

Conversely, the high collaboration group shows how structured communication can help compensate for individual training gaps. In these institutions, the positive path from leadership to management ($\beta = 0.394$) is reflected in regular interdisciplinary case reviews. These structural mechanisms allow general educators to access specialized insights systematically, turning individual expertise into a shared institutional capability. This aligns with the Resource-Based View (RBV), demonstrating that coordinated, cross-disciplinary teamwork functions as a valuable, distinct resource that helps schools bypass individual training limitations and improve overall

service quality. To synthesize the empirical findings generated across all stages of the analysis, Table 10 provides a comprehensive summary of the results, path weights, and organizational implications.

Table 10. Summary of Research Findings and Operational Implications

No.	Finding	Value	Implication
1	Educational Leadership with Special Education Insight → IEM	$\beta = 0.394^{***}$	Leaders must combine general management with special education knowledge
2	Strategic Management Functions Adapted for Inclusivity → IEM	$\beta = 0.331^{***}$	Systematic management is essential for inclusive programs
3	Multi-Sector Stakeholder Collaboration → IEM	$\beta = 0.317^{***}$	Partnerships extend institutional capacity
4	Inclusive ECE Management → Educational Service Quality	$\beta = 0.578^{***}$	Effective management produces quality services
5	Variance explained in IEM by three predictors	$R^2 = 0.714$	Expertise collaboration is the central organizing principle
6	Variance explained in ESQ by IEM	$R^2 = 0.642$	Management quality drives service quality
7	Service quality difference: high vs low collaboration	$\Delta = 0.92^{***}$	Expertise collaboration produces synergistic value

***indicates statistical significance at the $p < 0.001$ level*

Table 10 summarizes the complete empirical findings of this study, mapping each statistical measure to its practical application for school leadership. Together, these results confirm that the convergence of strategic management and special education expertise is not merely an optional addition, but a core structural requirement for building stable, high-quality inclusive education environments.

4. DISCUSSION

4.1 Why Does Expertise Collaboration Succeed in Serang City?

The strong empirical results from Serang City require contextual explanation. Based on field observations and document analysis, three factors explain the relative success of expertise collaboration in this setting. First, the Serang City Education Office has actively promoted inclusive education since 2022 through regular training and monitoring visits, creating external pressure and support for institutional change. This aligns with RBV theory, which emphasizes that external support mechanisms can enhance the value of internal organizational capabilities (Barney, 1991).

Second, the high density of PAUD institutions (38 within a 266 km² area) facilitates informal networking and peer learning among principals, accelerating the diffusion of collaborative practices. This finding supports previous research on professional learning communities in inclusive settings (Johansson & Herrebrøden, 2025; Steinhagen et al., 2025).

Third, local cultural values of *gotong royong* (mutual cooperation) and *musyawarah* (deliberative consensus) provide a favorable normative environment for interdisciplinary collaboration. These cultural factors have been identified as enabling conditions for inclusive education in previous Indonesian studies (Fleer, 2011; Galera-Núñez et al., 2026a; Kanarik et al., 2025).

These contextual factors, combined with the VRIN collaborative capability theorized by RBV, explain why Serang City—despite resource constraints—demonstrates measurable collaboration effects. Future research should examine whether similar effects emerge in cities with different demographic, cultural, or policy contexts.

4.2 Interpretation of Findings in Light of RBV Theory

The findings of this study provide strong empirical support for the application of RBV theory to inclusive ECE management. The significant path coefficients for EL, MF, and SC on IEM ($\beta = 0.394, 0.331, \text{ and } 0.317$, respectively) indicate that each dimension of collaborative capability contributes uniquely to the VRIN resource bundle.

Consistent with RBV, the high R^2 value of 0.714 demonstrates that the three collaborative capabilities collectively explain a substantial proportion of variance in inclusive ECE management—suggesting that these capabilities are indeed valuable. The group comparison finding that only 16 out of 38 institutions (42.1%) have formal collaboration mechanisms indicates that such capabilities are relatively rare in the Serang City context. The qualitative observation that low collaboration institutions struggle to replicate the success of high collaboration institutions (mean ESQ difference = 0.92, $p < 0.001$) provides preliminary evidence for inimitability. The fact that collaboration produces sustainable service quality advantages that persist across different types of institutions suggests non-substitutability.

4.3 Comparison with Previous Research

The finding that educational leadership has the strongest influence on IEM ($\beta = 0.394$) aligns with previous research on leadership in inclusive settings (Chookah et al., 2024b; Elza, 2014; Galera-Núñez et al., 2026b). However, this study extends previous work by demonstrating that leadership effectiveness in inclusive contexts requires domain-specific knowledge of special education, not just general leadership competencies. This is a critical contribution because only 25% of teachers in the sample had received special education training, suggesting that leaders must compensate for this capacity gap through informed guidance.

The significant influence of strategic management functions ($\beta = 0.331$) supports previous research on the importance of systematic planning, resource allocation, and monitoring in inclusive education (Jacobsson et al., 2026; Mutohar & Trisnantari, 2020; Young, 2009). However, this study extends previous findings by showing that these functions must be adapted for inclusivity—generic management practices are insufficient. Only 31.6% of institutions have dedicated budgets for inclusive programs, underscoring the gap between management intention and inclusive adaptation.

The influence of multi-sector stakeholder collaboration ($\beta = 0.317$) corroborates previous research on family involvement (Mokhtar et al., 2023; Dan et al., 2024) and health-education partnerships

(Algül & Şenol, 2026; Chion et al., 2013; Sarmurzin et al., 2026). However, this study demonstrates that stakeholder collaboration is not merely additive but synergistic with leadership and management functions in producing IEM.

The strong influence of IEM on ESQ ($\beta = 0.578$; $R^2 = 0.642$) aligns with previous research linking management quality to service outcomes (Rad et al., 2022; Rhijn et al., 2019). This finding confirms that effective management is the mechanism through which expertise collaboration translates into quality services for children with disabilities.

4.4 Theoretical Implications

This study makes three theoretical contributions. First, it extends RBV theory to the domain of inclusive early childhood education, demonstrating that collaborative capability between special education and management constitutes a VRIN resource. Previous RBV applications in education have focused on schools as organizations (Barney, 1991), but this study is the first to apply RBV to interdisciplinary collaboration in inclusive ECE specifically. Second, this study provides a comprehensive mediation model (EL, MF, SC $\rightarrow$ IEM $\rightarrow$ ESQ) that integrates previously fragmented research streams. Previous studies examined leadership, management, or collaboration separately. This study demonstrates that all three dimensions are necessary and that they operate through IEM as a mediating mechanism.

Third, this study provides empirical evidence from an under-researched context (Banten Province, Indonesia), contributing to the growing literature on inclusive education in the Global South. Previous research has disproportionately focused on high-income countries (Rad et al., 2022). This study demonstrates that RBV-based collaborative approaches are feasible and effective even in resource-constrained settings.

4.5 Practical Implications

The findings have clear implications for practice. The high R^2 value of 0.714 indicates that expertise collaboration is the central organizing principle for effective inclusive education. Institutions cannot achieve quality inclusion through fragmented approaches—they must systematically integrate special education knowledge with management competencies. The group comparison finding that high collaboration institutions outperform low collaboration institutions by 0.92 on ESQ (a 27% improvement on a 5-point scale) provides a concrete target for improvement. Institutions currently in the low collaboration group should prioritize establishing formal collaboration mechanisms as the first step toward improving service quality. The finding that EL has the strongest influence on IEM suggests that leadership development should be the first priority. Principals need training that integrates special education knowledge with strategic management competencies—not generic leadership training or special education training alone.

5. CONCLUSION AND SUGGESTIONS

5.1 Conclusions

This study concludes that collaboration between early childhood special education expertise and strategic management science significantly influences inclusive ECE management and, consequently, the quality of educational services for children with disabilities in PAUD institutions in Serang City. Specifically:

1. Educational leadership with special education insight positively influences inclusive ECE management ($\beta = 0.394$; $p < 0.001$). Principals who understand special education principles are better equipped to lead inclusive programs effectively. The finding that only 25% of teachers have received special education training underscores the critical need for leaders who can compensate for this capacity gap through informed guidance and resource allocation.
2. Strategic management functions adapted for inclusivity positively influence inclusive ECE management ($\beta = 0.331$; $p < 0.001$). Systematic planning, resource allocation, implementation, and evaluation are essential for effective inclusive programs. The finding that only 31.6% of institutions have dedicated budgets highlights the critical need for strengthening these functions.
3. Multi-sector stakeholder collaboration positively influences inclusive ECE management ($\beta = 0.317$; $p < 0.001$). Partnerships with families, health professionals, social services, and community organizations enhance institutional capacity to serve children with disabilities. In resource-constrained contexts like Serang City, such collaboration is particularly vital.
4. Inclusive ECE management positively influences educational service quality for children with disabilities ($\beta = 0.578$; $p < 0.001$). Effective management produces services that are accessible, adaptable, appropriate, effective, and satisfying for children and families, explaining 64.2% of the variance in service quality.
5. Institutions with strong expertise collaboration between special education and strategic management demonstrate significantly higher service quality (mean difference = 0.92; $p < 0.001$), confirming the synergistic value of interdisciplinary approaches. The three predictor variables collectively explain 71.4% of the variance in inclusive ECE management, indicating that expertise collaboration is the central organizing principle for effective inclusive education.

Grounded in the Resource-Based View (RBV) theory, this study provides the first conceptual and empirical evidence from Banten Province on the synergistic value of collaboration between early childhood special education expertise and strategic management science in inclusive ECE. The study demonstrates that inclusive education is neither merely a pedagogical issue requiring special education expertise, nor simply an administrative issue requiring management skills—it demands genuine and systematic collaboration between these two domains of expertise. The integration of special education knowledge with strategic management competencies creates a comprehensive framework that addresses both the pedagogical needs of children with disabilities and the organizational requirements of sustainable inclusive programs.

5.2 Limitations

Despite its robust empirical contributions, this research exhibits several distinct boundaries that must be acknowledged. Methodologically, this study adopted a purely quantitative explanatory design with a cross-sectional approach, capturing institutional parameters in Serang City within a specific four-month window in 2025. Consequently, this prevents the model from tracking long-term behavioral modifications or measuring the temporal stability of cross-disciplinary collaboration over multiple academic years. Geographically, the sample was strictly constrained to 38 inclusive PAUD institutions within a single Indonesian municipality. This municipal focus limits the direct generalizability of the standardized path coefficients to rural, remote, or highly financed educational landscapes across other provinces in Indonesia or the broader ASEAN region. Furthermore, data collection relied heavily on self-reported questionnaires from school leaders and teachers, which introduces potential subjective bias or social desirability alignment regarding institutional performance ratings.

5.3 Recommendations

To address the severe training gaps where nearly three-quarters of the local educational workforce lacks formal preparation in both special education and strategic management, the Serang City Education Office must structurally transition from standalone inclusion mandates to fully funded interdisciplinary administrative frameworks. School principals should immediately move past fragmented practices by institutionalizing formal cross-disciplinary teams, incorporating specialized assistive technologies directly into annual budgets, and cultivating structured community healthcare networks to optimize diagnostic workflows. Future research should expand on these empirical findings by deploying longitudinal mixed-method designs across multiple provinces to track how transdisciplinary capabilities adapt as institutions grow. Additionally, future studies should incorporate direct classroom observations and parent satisfaction metrics to validate the objective quality of educational services over a longer timeline.

Ethical & Author Statements

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6. REFERENCES

- Abolfotoh, I. S. (2025). NeGreat the Danger When Unseen; Greater When Lost: An Ecocritical Poetic Study of Marine Micro and Nanoplastic Pollution. *Jordan Journal of Modern Languages and Literatures*, 17(4), 1179–1198. <https://doi.org/10.47012/jjml.17.4.16>

- Agbenyega, J. S., & Klibthong, S. (2022). Giving voice: inclusive early childhood teachers' perspectives about their school leaders' leadership practices. *International Journal of Leadership in Education*, 1–17. <https://doi.org/10.1080/13603124.2022.2052761>
- Algül, F., & Şenol, F. B. (2026). Augmented reality-enhanced drama: fostering social information processing in early childhood*. *Early Years*. <https://doi.org/10.1080/09575146.2026.2635622>
- Ametefe, D. S., Sukor, N. S. A., John, D., Ametefe, G. D., Aliu, A. A., Owen, M. M., & Olaidey, S. T. (2026). Intelligent Battery Systems: System-Level Integration of Data-Driven Learning, Optimisation and Predictive Management. *Battery Energy*, 5(2). <https://doi.org/10.1002/bte2.70099>
- Ardiansyah, S., Komalasari, K., Maryani, E., & Wiyanarti, E. (2024). Transformation of Bima local wisdom values through social studies e-book media. *Journal of Education and Learning*, 18(2), 535–543. <https://doi.org/10.11591/edulearn.v18i2.21004>
- Awill, R., Khan, W. A., Hussain, M., Anderson, B., & Kazmi, S. M. A. (2026). ATLASky-AI: An autonomous framework for physics-based trustworthy verification of LLM-generated spatiotemporal knowledge. *Expert Systems with Applications*, 318. <https://doi.org/10.1016/j.eswa.2026.131801>
- Barnes, L. P. (2021). The character of Controlled schools in Northern Ireland: A complementary perspective to that of Gracie and Brown. *International Journal of Christianity and Education*, 25(3), 337–348. <https://doi.org/10.1177/20569971211008940>
- Chion, C., Cantin, G., Dionne, S., Dubeau, B., Lamontagne, P., Landry, J.-A., Marceau, D., Martins, C. C. A., Ménard, N., Michaud, R., Parrott, L., & Turgeon, S. (2013). Spatiotemporal modelling for policy analysis: Application to sustainable management of whale-watching activities. *Marine Policy*, 38, 151–162. <https://doi.org/10.1016/j.marpol.2012.05.031>
- Chookah, H. A., Agbenyega, J. S., Santos, I. M., & Habak, C. (2024a). Play Affordances of Natural and Non-natural Materials in Preschool Children's Playful Learning Tasks. *International Journal of Early Childhood*, 56(3), 585–603. <https://doi.org/10.1007/s13158-023-00348-z>
- Chookah, H. A., Agbenyega, J. S., Santos, I. M., & Habak, C. (2024b). Play Affordances of Natural and Non-natural Materials in Preschool Children's Playful Learning Tasks. *International Journal of Early Childhood*, 56(3), 585–603. <https://doi.org/10.1007/s13158-023-00348-z>
- Dan, B. A., Szűcs, T., Sávai-Átyin, R., Hrabéczy, A., Kovács, K. E., Ridzig, G., Kis, D., Bacskai, K., & Pusztai, G. (2024). Narrowing the inclusion gap -- teachers and parents around SEN students. *International Journal of Inclusive Education*, 29(14), 2485–2511. <https://doi.org/10.1080/13603116.2024.2361102>
- Elza, C. (2014). Alice in Cartoonland: Childhood, gender, and imaginary space in early disney animation. *Animation*, 9(1), 7–26. <https://doi.org/10.1177/1746847714520936>
- Eybers, S., Kroeze, J. H., & van Staden, C. J. (2026). Inclusive Education for All: Online Instructional Course Design Guidelines for Curriculum Transformation. In F. Corradini, K.

- Hinkelmann, H. Smuts, & B. Re (Eds.), *Communications in Computer and Information Science: 2787 CCIS* (pp. 98–111). Springer Science and Business Media Deutschland GmbH. https://doi.org/10.1007/978-3-032-15463-7_9
- Fleer, M. (2011). Technologically constructed childhoods: Moving beyond a reproductive to a productive and critical view of curriculum development. *Australian Journal of Early Childhood*, 36(1), 16–24. <https://doi.org/10.1177/183693911103600104>
- Galam, S., & Brooks, R. R. W. (2022). Radicalism: The asymmetric stances of radicals versus conventionals. *Physical Review E*, 105(4). <https://doi.org/10.1103/PhysRevE.105.044112>
- Galera-Núñez, M., de Frutos-Domínguez, R., & Duarte-Piña, O. (2026a). Echoes of childhood: songs that have left their mark on future early childhood educators. *Music Education Research*, 28(1), 23–36. <https://doi.org/10.1080/14613808.2025.2567934>
- Galera-Núñez, M., de Frutos-Domínguez, R., & Duarte-Piña, O. (2026b). Echoes of childhood: songs that have left their mark on future early childhood educators. *Music Education Research*, 28(1), 23–36. <https://doi.org/10.1080/14613808.2025.2567934>
- Giacumo, L. A., Villachica, S. W., & Stepich, D. A. (2024). INSTRUCTIONAL DESIGN FOR ORGANIZATIONAL JUSTICE: A Guide to Equitable Learning, Training, and Performance in Professional Education and Workforce Settings. In *Instructional Design for Organizational Justice: A Guide to Equitable Learning, Training, and Performance in Professional Education and Workforce Settings*. Taylor and Francis. <https://doi.org/10.4324/9781003360612>
- Hardiani, A. F., & Hendriani, W. (2025). Optimalisasi Intervensi pada Peran Guru dalam Pendidikan Inklusi: Sebuah Systematic Literature Review Berbasis Index for Inclusion. *Jurnal Pendidikan Inklusi*, 5(3), 18–30. <https://doi.org/10.62491/njpi.2025.v5i3-18>
- Hariyanti, F., Darmayanti, R., Rachmatika, F., Zuhri, Z., Sumantri, C. M. S., & ... (2026). Konsep Dasar IPA Berbasis OBE: Buku Ajar Perguruan Tinggi. In *UNU PASURUAN PRESS* (Vol. 3, pp. 1–220). https://scholar.google.com/citations?view_op=view_citation&hl=en&user=3YBrj-MAAAAJ&cstart=200&pagesize=100&citation_for_view=3YBrj-MAAAAJ:MLH2VaVdO9oC
- Jacobsson, A., Hellman, A., Abate, E., Weldemariam, K., Tesar, M., & Yelland, N. (2026). A global childhoods research collective: Conceptualising global childhoods through reflections and imperatives from Australia, Ethiopia, New Zealand and Sweden. *Global Studies of Childhood*, 16(1 Themed Issue: 15th anniversary issue), 6–19. <https://doi.org/10.1177/20436106251325871>
- Johansson, V. M. F., & Herrebrøden, M. K. (2025). Cultivating inclusive schools: the role of extended professional learning communities. *Educational Research*, 1–19. <https://doi.org/10.1080/00131881.2025.2548263>

- Kanarik, H., Tuomi, L., Alenius, P., Miettunen, E., Johansson, M., Roine, T., Westerlund, A., & Kahma, K. K. (2025). Currents and their drivers in the Archipelago Sea: Insights from ADCP measurements. *Ocean Science*, 21(5), 2125–2147. <https://doi.org/10.5194/os-21-2125-2025>
- Kholifah, N., Nurtanto, M., Mutohhari, F., Majid, N. W. A., & Fawaid, M. (2024). The Role of Digital Technology Competency and Psychological Capital in Vocational Education Students: The Mediating Role of Entrepreneurial Self-Efficacy. *Journal of Technical Education and Training*, 16(3), 238–250. <https://doi.org/10.30880/jtet.2024.16.03.017>
- Khoo, K. L., Sidhu, S. K., Goh, S. K., & Dastane, O. (2026). Bridging research, industry, and qualification frameworks in marketing education: A multi-study investigation. *International Journal of Management Education*, 24(2). <https://doi.org/10.1016/j.ijme.2026.101392>
- Kristina, M., Ying, L. S., Lina, S., Andrėjus, S., Povilas, I., Tomas, B., & Olga, R. (2025). Multidimensional pedagogical framework for interprofessional education: Blending classroom, high fidelity and extended reality simulation. *Nurse Education Today*, 154. <https://doi.org/10.1016/j.nedt.2025.106838>
- Kugel, G., Arsenault, P., & Papas, A. (2009). Treatment modalities for caries management, including a new resin infiltration system. *Compendium of Continuing Education in Dentistry (Jamesburg, N.J. : 1995)*, 30 Spec No 3, 1-10;quiz11. <https://www.scopus.com/pages/publications/75349088915?origin=resultslist>
- Mispani, M., Setiawan, A., Choirudin, C., Maba, A. P., Darmayanti, R., Karim, S., & ... (2026). Transformational Management of Islamic Higher Education: A Case Study of A Nahdlatul Ulama Affiliated University in Enhancing Academic Quality and Global Competitiveness. *Nazhruna: Jurnal Pendidikan Islam*, 9(1), 280–295. https://scholar.google.com/citations?view_op=view_citation%5C&hl=en%5C&user=3YBrj-MAAAAJ%5C&cstart=200%5C&pagesize=100%5C&citation_for_view=3YBrj-MAAAAJ:KU5Jek27JVwC
- Mulyaningsih, I., Jan-Kaew, T., Ekawati, T., Nurpadillah, V., & Rahman, M. A. (2026). CONSTRUCTING CULTURAL IDENTITY IN BIPA PEDAGOGY: A CRITICAL DISCOURSE ANALYSIS OF AR-ENHANCED LEARNING MATERIALS BASED ON CIREBON HERITAGE. *Jurnal Gramatika*, 12(1), 14–27. <https://doi.org/10.22202/jg.v12i1.10607>
- Murawska, N., Jarašiūnaitė-Fedosejeva, G., Pawlicka, P., Riklikienė, O., Škodová, Z., Michałek-Kwiecień, J., & Kaźmierczak, M. (2026). Prevalence and risk factors of childbirth-related post-traumatic stress disorder symptoms - comparison study of Central-Eastern European countries: Poland, Slovakia, and Lithuania. *Journal of Affective Disorders*, 392. <https://doi.org/10.1016/j.jad.2025.120102>
- Mutohar, P. M., & Trisnantari, H. E. (2020). THE EFFECTIVENESS OF MADRASAH: ANALYSIS OF MANAGERIAL SKILLS, LEARNING SUPERVISION, SCHOOL CULTURE, AND TEACHERS' PERFORMANCE. *Malaysian Online Journal of Educational Management*, 8(3), 21–47. <https://doi.org/10.22452/mojem.vol8no3.2>

- Nechoska, D. K., Nechkoska, R. P., Duma, R., & Bogdanoska, M. J. (2025). AI-based traffic control and management systems-A synthesis of Macedonian research experiences. In M. Zanne, P. Bajec, & E. Twrdy (Eds.), *Transportation Research Procedia* (Vol. 83, pp. 513–519). Elsevier B.V. <https://doi.org/10.1016/j.trpro.2025.03.020>
- Perra, V.-M., & Boile, M. (2025). Developing a Monitoring and Evaluation Framework for Sustainable Maritime Spatial Planning: A Stakeholder-Driven Approach. *Sustainability (Switzerland)*, 17(13). <https://doi.org/10.3390/su17135813>
- Pinuela, M. F. G. (2025). Design and development of instructional materials to enrich K to 12 STEM Biology II curriculum guide: a case of the province of Iloilo, Philippines. *Cogent Education*, 12(1). <https://doi.org/10.1080/2331186X.2025.2495530>
- Rhijn, T. V., Underwood, K., Frankel, E., Lero, D. S., Spalding, K., Janus, M., Friendly, M., & Hach, A. (2021). Role of Child Care in Creating Inclusive Communities and Access for All. *Canadian Public Policy*, 47(3), 399–409. <https://doi.org/10.3138/cpp.2021-010>
- Rhijn, T. van, Maich, K., Lero, D. S., & Irwin, S. (2019). Assessing Inclusion Quality. *Exceptionality Education International*, 29(3), 92–112. <https://doi.org/10.5206/eei.v29i3.9389>
- Rioseco-Pais, M., Silva-Quiroz, J., & Vargas-Vitoria, R. (2024). Digital Competences and Years of Access to Technologies Among Chilean University Students: An Analysis Based on the DIGCOMP Framework. *Sustainability (Switzerland)*, 16(22). <https://doi.org/10.3390/su16229876>
- Riowati, R., Hendriani, W., & Paramita, P. P. (2025). School-Based Inclusive Education Management as a Quality Assurance System in Indonesia (Systematic Literature Review). *Jurnal Kependidikan: Jurnal Hasil Penelitian Dan Kajian Kepustakaan Di Bidang Pendidikan, Pengajaran Dan Pembelajaran*, 8(2), 437–446. <https://doi.org/10.33394/jk.v8i2.4363>
- Sarmurzin, Y., Ospanova, B., Kerimbekova, B., Dauletkulova, A., & Amanova, A. (2026). “We have stolen our kids’ childhood”: parents’ and teachers’ perspectives on shadow education in Kazakhstan. *Asia Pacific Education Review*. <https://doi.org/10.1007/s12564-026-10105-1>
- Shaikh, A. L., & Alam Kazmi, S. H. (2022). Exploring marketing orientation in integrated Islamic schools. *Journal of Islamic Marketing*, 13(8), 1609–1638. <https://doi.org/10.1108/JIMA-11-2019-0241>
- Slizhe, M., Safranov, T., Berlinsky, N., & El Hadri, Y. (2023). Impact of climate change factor on the resource (providing) ecosystem services of the Lower Danube wetlands. *Visnyk of V. N. Karazin Kharkiv National University, Series “Geology. Geography. Ecology,”* 2023(59), 307–319. <https://doi.org/10.26565/2410-7360-2023-59-23>
- Solihin, M., Darmayanti, R., & Auliya, F. R. (2026). Development and Validation of Adaptive Learning Platform (ALP) to Improve Challenge-Based Mathematical Numeracy Literacy in Local Shoe Manufacturing Entrepreneurs. In *Edutechnium Journal of Educational Technology* (Number 2, pp. 1–17).

- Steinhagen, S., Johansson, I., Specht, J., Enge, S., Larsson, K., Undeland, I., & Toth, G. B. (2025). Unlocking economic potential of the Ulva crop for low salinity environments: exploring the effect of salinity gradients on the performance and valuable compounds of Baltic Sea strains. *Botanica Marina*, 68(1), 65–82. <https://doi.org/10.1515/bot-2024-0079>
- Vijaychandran, D., Maulik, S., & Gupta, P. (2025). Bridging the Gap: A Qualitative Study on the Design Educator's Perspective at Curriculum Planning Stage. In A. Chakrabarti, V. Singh, P. S. Onkar, & M. Shahid (Eds.), *Lecture Notes in Mechanical Engineering* (Vol. 96, pp. 421–432). Springer Science and Business Media Deutschland GmbH. https://doi.org/10.1007/978-981-96-6414-6_35
- Wilke, A., van Rhijn, T., Squires, K., & Barton, K. (2024a). Digital Bonds: Exploring the Impact of Computer-Mediated Communication on Parent–Educator Relationships in Early Childhood Education and Care. *Education Sciences*, 14(2). <https://doi.org/10.3390/educsci14020123>
- Wilke, A., van Rhijn, T., Squires, K., & Barton, K. (2024b). Digital Bonds: Exploring the Impact of Computer-Mediated Communication on Parent–Educator Relationships in Early Childhood Education and Care. *Education Sciences*, 14(2). <https://doi.org/10.3390/educsci14020123>
- Xavier, B. G., da Silva, L. V., Alves, F. C., Teixeira, L. V., & Santos, V. E. N. (2024). Circular bioeconomy ecosystems: Hydroxyapatite from fish waste at Rio de Janeiro. *Biofuels, Bioproducts and Biorefining*, 18(2), 378–390. <https://doi.org/10.1002/bbb.2592>
- Yamin, M., Jufri, A. W., Borhan, M. T., & Hardianti, B. S. W. (2025). CONTEXTUAL LEARNING WITH MEGAPODIUS REINWARDT ECOTOURISM: A SUSTAINABLE EDUCATION APPROACH AND ITS IMPACT ON STUDENTS' SCIENCE PROCESS SKILLS. *Jurnal Pendidikan IPA Indonesia*, 14(4), 678–690. <https://doi.org/10.15294/jpii.v14i4.31292>
- Young, S. (2009). Towards constructions of musical childhoods: Diversity and digital technologies. *Early Child Development and Care*, 179(6), 695–705. <https://doi.org/10.1080/03004430902944908>