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Policy Paper: Strengthening BLUD and Teaching Factory Implementation in Kepulauan Riau Vocational High Schools

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ABSTRACT

Vocational high schools in the Kepulauan Riau require governance arrangements that integrate industry-based learning with flexible, accountable, and sustainable management of school resources. This policy paper evaluates the integrated implementation of the Regional Public Service Agency (BLUD) and Teaching Factory in 12 state vocational high schools using the Context, Input, Process, Product (CIPP) evaluation framework. The study is based on a cross-sectional questionnaire involving 230 respondents, including school leaders, heads of expertise programs, vocational teachers, Teaching Factory managers, BLUD managers, and education personnel. The revised analysis resolves earlier inconsistencies in scoring and applies a single transparent interpretation rule across all indicators. The corrected CIPP results show scores of 82.0% for Context, 76.8% for Input, 76.8% for Process, and 81.2% for Product, with an overall mean of 79.2%. The results indicate relatively strong policy and industry alignment, while funding support, program support personnel, BLUD administration, and monitoring and evaluation remain the main implementation constraints. These findings are interpreted as stakeholder perceptions of program performance rather than evidence of causal effects. Policy alternatives are prioritized based on problem severity, implementation feasibility, regional-government authority, and expected contributions to program sustainability. The paper recommends operational BLUD guidelines, targeted managerial capacity building, protected financing for production units, routine performance monitoring, stronger school-industry co-governance, and production units aligned with the maritime and service-based economy of the Kepulauan Riau to strengthen long-term institutional effectiveness and program continuity.

Keyword: BLUD, Teaching Factory, Vocational Education, CIPP, Policy Evaluation

INTRODUCTION

Vocational education is expected to reduce the distance between what students learn in school and what firms require in the workplace. That expectation has become more demanding because automation, digitalization, and changing occupational structures require graduates who combine technical competence with

adaptability, communication, collaboration, problem solving, and digital capability. Recent Indonesian research consistently reports that work readiness depends not only on mastery of occupational tasks but also on exposure to authentic work processes and on the capacity of schools to keep curricula, teachers, facilities, and assessment practices aligned with industry (Nurjanah et al., 2022; Rusmiyati et al., 2026; Daryono & Achmadi, 2025). International evidence similarly indicates that structured work-based learning can shape both cognitive and non-cognitive outcomes, although results depend on program design and the amount and quality of workplace exposure (Tobback et al., 2025). For vocational high schools, the policy issue is therefore not simply whether practical learning exists, but whether it is governed as a coherent system that connects learning, production, finance, human resources, and industry relations.

The Teaching Factory model addresses this problem by organizing learning around real or industry-like production and service processes. Rather than treating practice as an isolated simulation, Teaching Factory activities can integrate job orders, quality standards, teamwork, customer orientation, entrepreneurship, and production discipline into the learning environment. Indonesian studies show that Teaching Factory implementation can strengthen the relevance of vocational learning, entrepreneurial experience, and students' orientation toward work when it is supported by adequate management and facilities (Azizah et al., 2019; Kuat & Purnawan, 2022; Sutiadiningsih & Mahfud, 2023; Rejeki & Kuat, 2023). At the same time, evaluations repeatedly identify recurring constraints: incomplete operating rules, weak production-unit governance, uneven human-resource competence, limited equipment, and inconsistent monitoring (Sudiyono, 2020; Wahjusaputri et al., 2020; Wijanarka et al., 2023). These findings imply that pedagogical innovation alone cannot sustain Teaching Factory implementation; institutional and financial governance must evolve at the same pace.

In Indonesia, the Regional Public Service Agency or Badan Layanan Umum Daerah (BLUD) provides a governance mechanism that can give public service units greater flexibility in financial management while maintaining public accountability. For vocational high schools, BLUD arrangements are potentially important because Teaching Factory activities generate operational needs that differ from ordinary classroom expenditure: schools may need to procure production inputs rapidly, manage service income, maintain equipment, respond to customer orders, and reinvest revenue in training or production units. Minister of Home Affairs Regulation Number 79 of 2018 provides the general basis for BLUD management, while the Kepulauan Riau provincial policy framework has encouraged stronger governance of vocational production units and industry-based learning. The central policy question is whether financial flexibility and Teaching Factory pedagogy are being integrated in practice, or whether they continue to operate as parallel programs with separate administrative routines.

The Kepulauan Riau provide a particularly relevant setting for this question. As an archipelagic province with economic activity linked to manufacturing, maritime services, tourism, logistics, trade, and other service sectors, the province requires vocational institutions that can respond to geographically dispersed labor markets and rapidly changing employer needs. School-industry relationships therefore need to go beyond ceremonial memoranda of understanding. Research on vocational partnerships shows that effective collaboration is managerial: it requires joint curriculum planning, shared use of resources, teacher and student workplace exposure, routine evaluation, and mechanisms for renewing commitments when industry needs change (Estriyanto, 2021; Setiawan et al.,

2024; Kasanah et al., 2025; Ahmad & Mastiani, 2025). Studies of wider vocational-industry linkages also demonstrate that relationship intensity and firm involvement matter for the perceived value of collaboration (Olazaran et al., 2019), while international collaboration research emphasizes the benefit of linking vocational learning to authentic occupational and organizational environments (Gao, 2019).

Previous Indonesian evaluations have provided a strong basis for assessing Teaching Factory implementation through the CIPP framework. CIPP is useful because it separates the enabling environment (Context), resource readiness (Input), implementation quality (Process), and achieved or perceived outputs (Product). Studies in different vocational-school settings have used CIPP to identify the relationship between policy support, facilities, implementation routines, and student outcomes (Pratiwi et al., 2019; Kuntjoro et al., 2021; Yoto et al., 2024; Prihantoro et al., 2025; Farabbanie et al., 2026). A recent evaluation in Tanjungpinang further confirms the relevance of CIPP for understanding Teaching Factory implementation in the Kepulauan Riau context (Fitrinaldi et al., 2026). However, these studies largely focus on the Teaching Factory as an educational program. Fewer studies examine how Teaching Factory implementation interacts with BLUD financial and administrative governance, particularly at the provincial level across multiple schools.

This policy paper addresses that gap by treating BLUD and Teaching Factory implementation as one governance problem. Its contribution is fourfold. First, it revises and reconciles the descriptive results so that the component scores, detailed indicators, abstract, tables, figures, and conclusions use the same calculations. Second, it makes the scoring logic explicit and applies a single interpretation rule consistently. Third, it separates descriptive association from causal inference: reported improvements in competencies and learning quality are interpreted as respondent perceptions within a cross-sectional survey, not as proven causal impacts. Fourth, it converts the evaluation into a policy decision framework by linking the weakest indicators to alternatives that can be prioritized according to severity, feasibility, governmental authority, and sustainability. This approach is closer to the purpose of a policy paper than a conventional descriptive article because the empirical diagnosis is used to justify a sequence of implementable policy actions.

Accordingly, the study asks three questions: (1) how strong are the Context, Input, Process, and Product dimensions of integrated BLUD and Teaching Factory implementation across the sampled vocational high schools; (2) which specific implementation constraints most clearly weaken the program; and (3) which policy interventions should receive priority from the provincial government and participating schools. The analysis is intended to support policy learning rather than claim population-wide causal generalization. Its practical value lies in identifying where policy support is already adequate, where administrative and resource gaps remain, and how the Kepulauan Riau can move from fragmented implementation toward an integrated system of vocational learning, production-unit management, and industry partnership.

RESEARCH METHOD

This study uses a descriptive quantitative policy-evaluation design with the CIPP framework. The unit of analysis is the implementation of BLUD and Teaching Factory arrangements in state vocational high schools in the Kepulauan Riau Province. CIPP was selected because it allows program performance to be

examined as a sequence of enabling conditions, resource readiness, implementation processes, and perceived results rather than as a single composite score. This structure is consistent with recent Teaching Factory evaluations that use CIPP to identify operational bottlenecks and improvement priorities in vocational education (Pratiwi et al., 2019; Yoto et al., 2024; Prihantoro et al., 2025). The design is cross-sectional: it describes conditions reported at one period of implementation and therefore does not establish changes over time or causal effects.

The study covers 12 state vocational high schools located in Batam, Tanjungpinang, Natuna, Bintan, Lingga, and other parts of the Kepulauan Riau. The sites were purposively included because they had implemented or were preparing to implement BLUD and Teaching Factory arrangements and therefore represented schools directly exposed to the policy. Within the selected schools, respondents were drawn from roles connected to program governance and implementation: school principals, vice principals, heads of expertise programs, vocational-subject teachers, Teaching Factory managers, BLUD managers, and education personnel. A total of 230 questionnaires were included in the descriptive analysis. Because the available study records do not contain a complete province-wide sampling frame or response-rate documentation for every occupational group, the findings are interpreted as a structured multi-school policy diagnosis rather than a statistically representative estimate for all vocational schools in the province.

The questionnaire used a Likert-type response format and covered indicators related to policy support, alignment with industry needs, program documentation, stakeholder and industry support, vocational-teacher competence, practical facilities, funding, support personnel, industry collaboration, project-based learning, student involvement in production, BLUD administrative management, monitoring and evaluation, student competence, learning quality, production-unit development, and industry collaboration outcomes. In the revised manuscript, the reported indicators were remapped explicitly to the four CIPP domains so that each variable has a clear analytical location. Context concerns the policy and stakeholder environment; Input concerns human, financial, facility, and partnership resources; Process concerns the quality of implementation and management routines; and Product concerns perceived educational and institutional results.

The revision also clarifies the limits of instrument validation. The source dataset reports aggregate indicator percentages but does not provide item-level response files, item wording, pilot-test records, factor-analysis results, or internal-consistency coefficients. Consequently, this paper does not invent reliability statistics that cannot be reproduced. Instead, content coherence is strengthened analytically by matching each reported indicator to the CIPP construct it is intended to represent and by disclosing the absence of item-level psychometric evidence as a limitation. Future evaluation cycles should retain item-level data and report content-validation procedures, construct testing where appropriate, and reliability coefficients for each CIPP scale. This disclosure improves methodological transparency even though it cannot retroactively replace unavailable validation evidence.

For descriptive scoring, each indicator is expressed as a percentage of the maximum attainable Likert score. Component scores are calculated as the arithmetic mean of their reported indicator percentages. To remove the inconsistent category labels in the earlier manuscript, this revision applies one

policy-screening rule uniformly: scores below 65.0 are classified as Weak; 65.0-74.9 as Needs Strengthening; 75.0-84.9 as Good; and 85.0-100 as Very Good. These intervals are used as a transparent decision rubric for this policy paper, not as a claim that the cut-offs represent universally validated psychometric thresholds. Their purpose is to make interpretation consistent and to separate acceptable implementation from areas that require targeted intervention.

The recalculation produces corrected component values. The Context indicators average 82.0%, the Input indicators 76.8%, the Process indicators 76.8%, and the Product indicators 81.2%. The overall CIPP mean is therefore 79.2%. These values replace the inconsistent summary figures previously reported for Context, Input, and the overall average. All tables, figures, narrative interpretations, and the abstract in the revised manuscript use the corrected calculations. The analysis emphasizes both averages and within-component variation because high component means can conceal specific bottlenecks such as funding support, support personnel, BLUD administration, or monitoring.

Policy alternatives were derived by connecting each identified bottleneck to an intervention that can be undertaken by the provincial government, school leadership, BLUD managers, and industry partners. Alternatives were then prioritized using four qualitative criteria: problem severity, defined by the relative weakness of the underlying indicator; implementation feasibility, defined by whether the intervention can be operationalized through existing provincial and school governance; authority fit, defined by whether the responsible actor has a clear mandate to act; and sustainability contribution, defined by the intervention's expected ability to stabilize Teaching Factory and BLUD operations over time. The framework does not assign fabricated numerical benefit-cost scores. Instead, it uses the observed evidence to classify actions into immediate, medium-term, and developmental priorities.

Ethical safeguards for future iterations should include documented informed consent, confidentiality protection, and clear separation between evaluation responses and personnel-performance decisions. The available manuscript records do not report a formal institutional ethics-review number, so none is claimed here. The study also has several limitations that shape interpretation: the data are self-reported; school selection is purposive; the survey is cross-sectional; raw item-level data are unavailable; and there is no counterfactual group or baseline. Accordingly, statements in the Results and Discussion section refer to perceived performance and reported conditions. The paper avoids causal language such as 'the program caused' or 'the program had an impact' unless supported by a design capable of causal inference.

RESULTS AND DISCUSSION

The findings are organized from coverage and overall CIPP performance to the four components and, finally, to policy prioritization. The discussion does not treat percentage scores as ends in themselves. Each score is interpreted in relation to implementation theory, recent vocational-education evidence, and the institutional logic of combining Teaching Factory learning with BLUD governance.

1. Respondent Coverage and Analytical Scope

The respondent distribution shows that the evaluation includes schools from several island and urban contexts rather than concentrating on a single municipality. This breadth is useful for identifying common implementation issues across different school environments, although the purposive design means the

distribution should not be interpreted as a probability sample of all vocational schools in the province. Table 1 presents the number of questionnaires included from each participating school.

Table 1. Distribution of Research Respondents

No.	School	Respondents
1	SMK Negeri 1 Batam	24
2	SMK Negeri 2 Batam	20
3	SMK Negeri 5 Batam	18
4	SMK Negeri 6 Batam	18
5	SMK Negeri 7 Batam	20
6	SMK Negeri 1 Tanjungpinang	22
7	SMK Negeri 3 Tanjungpinang	24
8	SMK Negeri 4 Tanjungpinang	18
9	SMK Negeri 1 Bunguran Barat	16
10	SMK Negeri 1 Bintan Timur	18
11	SMK Negeri 1 Singkep	16
12	SMK Negeri 1 Binut	16
	Total	230

Source: Research Data, 2026

The largest school-level contributions are 24 respondents each from SMK Negeri 1 Batam and SMK Negeri 3 Tanjungpinang, while the smallest are 16 respondents from SMK Negeri 1 Bunguran Barat, SMK Negeri 1 Singkep, and SMK Negeri 1 Binut. The spread supports a multi-site diagnostic perspective and captures governance roles across schools with different locations and program circumstances. Nevertheless, because the dataset does not provide response proportions by role or school population, comparisons should focus on the integrated provincial pattern rather than assume that each school's percentage has identical statistical precision.

2. Corrected Overall CIPP Performance

The first diagnostic question is whether integrated BLUD and Teaching Factory implementation is broadly supported or fundamentally weak. Using the corrected component averages and a uniform classification rule, the program is generally in the Good range. Table 2 summarizes the four component scores and the recalculated overall mean, making the revised numerical basis explicit. Context is the strongest component at 82.0%, followed by Product at 81.2%. Input and Process are both 76.8%, which means the main challenge is not the absence of policy direction but the conversion of supportive policy into resources and repeatable management routines.

This pattern resembles other Teaching Factory evaluations in which policy legitimacy and student participation can be relatively strong while facilities, managerial competence, evaluation standards, or operating procedures remain uneven (Kuntjoro et al., 2021; Wijanarka et al., 2023; Farabbanie et al., 2026). The difference between Context and Process is particularly important for policy: strong endorsement does not automatically produce administrative capability.

Table 2. Summary of Corrected CIPP Evaluation Results

No	Evaluation Component	Percentage (%)	Category
1	Context	82.0	Good
2	Input	76.8	Good
3	Process	76.8	Good
4	Product	81.2	Good
5	Overall average	79.2	Good

Source: Recalculated from Research Data, 2026

The relative position of the four CIPP components is easier to see when the corrected values are displayed together. Figure 1 visualizes the narrow but meaningful gap between the enabling context and the resource and process dimensions.

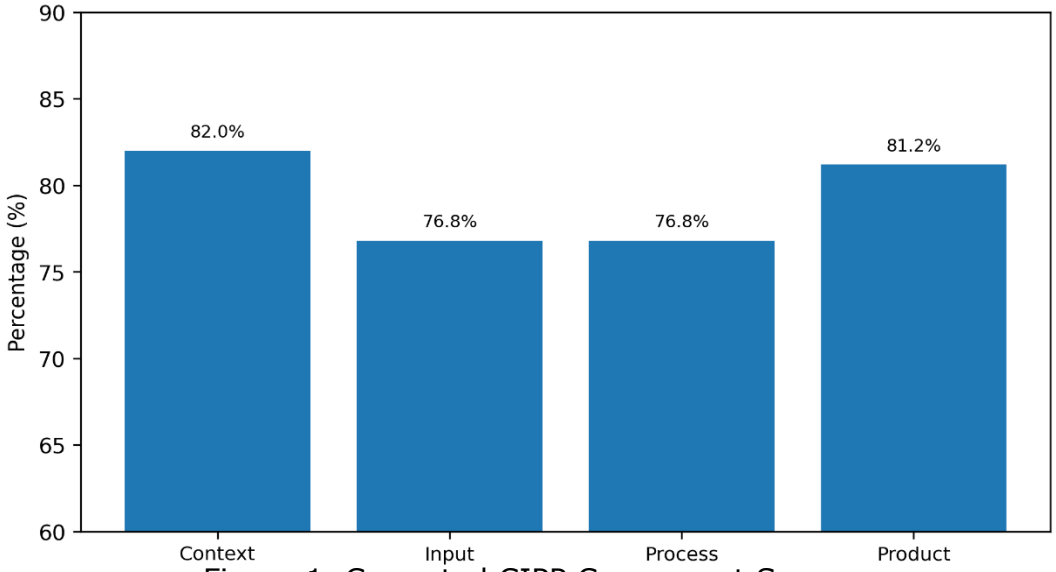


Figure 1. Corrected CIPP Component Scores
Source: Recalculated from Research Data, 2026

Figure 1 confirms that no component falls into the Weak or Needs Strengthening category at the aggregate level, but aggregate performance masks lower individual indicators. This distinction matters because an overall Good rating could otherwise encourage policy complacency. Recent CIPP-based studies similarly caution that component averages should be read alongside specific sub-indicators when the aim is program improvement rather than simple certification of success (Pratiwi et al., 2019; Yoto et al., 2024; Prihantoro et al., 2025).

3. Context: Policy Alignment Is Stronger Than Stakeholder Institutionalization

Context evaluation examines whether schools operate within a supportive policy environment and whether program objectives correspond to external needs. The Kepulauan Riau results indicate that policy direction and industry relevance are generally established, but not every dimension of stakeholder support is equally strong. Table 3 presents the six Context indicators using the standardized category rule.

Table 3. Context Evaluation Results

Indicator	Percentage (%)	Category
School policy support	84.2	Good
Program alignment with industry needs	85.1	Very Good
Availability of program documents	81.7	Good
Stakeholder support	78.6	Good
Alignment of BLUD program direction	80.4	Good
Industry support	82.1	Good
Average	82.0	Good

Source: Research Data, 2026

Program alignment with industry needs is the only Context indicator rated Very Good at 85.1%, while stakeholder support is the lowest at 78.6% but remains Good. The result suggests that the strategic idea of industry-oriented vocational education is accepted, yet its implementation still depends on how consistently external actors and internal stakeholders participate. Research on link-and-match policy emphasizes that relevance requires continual interaction with employers rather than a one-time curriculum adjustment (Disas, 2018; Estriyanto, 2021). Likewise, partnership-management studies show that planning, organizational responsibility, implementation, and evaluation must all be institutionalized if collaboration is to survive changes in personnel or industrial demand (Setiawan et al., 2024; Kasanah et al., 2025).

Because all Context values are relatively high, visual comparison is useful for identifying the narrower differences that may still affect implementation. Figure 2 displays the relative strength of policy support, industry alignment, program documentation, stakeholder support, BLUD direction, and industry support.

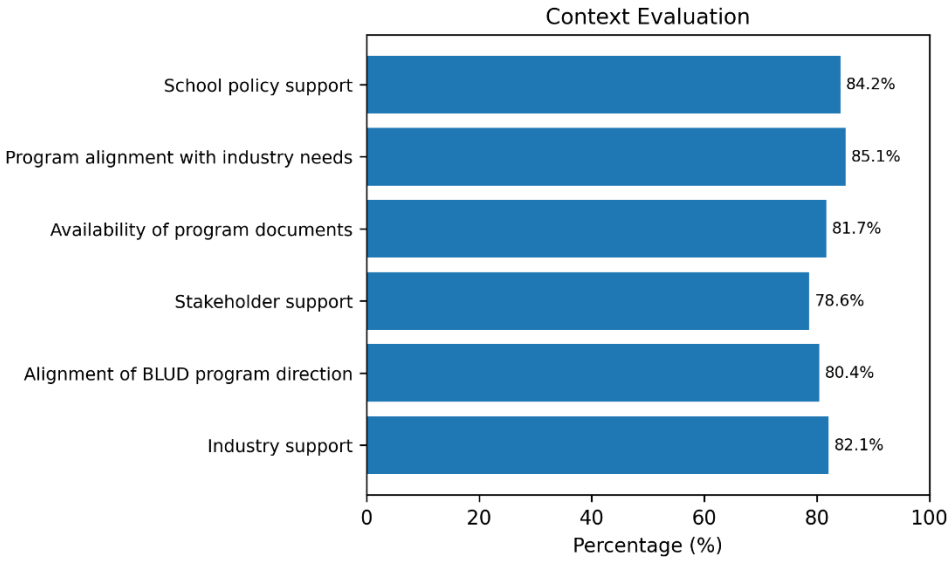


Figure 2. Profile of Context Indicators
Source: Research Data, 2026

The figure reinforces a central governance interpretation: the province does not primarily face a policy-recognition deficit. The remaining Context challenge is to convert broad support into more durable co-governance arrangements with industry and stakeholders. This means clarifying roles in curriculum

synchronization, teacher internships, student production projects, competency certification, product quality standards, and periodic program review. Partnership evidence from Indonesia and abroad indicates that vocational-industry relationships become more valuable when interaction is frequent, reciprocal, and embedded in operational routines rather than limited to formal agreements (Olazaran et al., 2019; Gao, 2019; Ahmad & Mastiani, 2025).

4. Input: Funding and Support Personnel Are the Main Resource Bottlenecks

Input evaluation shifts attention from policy intention to the resources required for implementation. Strong teachers and industry collaboration can support Teaching Factory learning, but production-based learning also requires financing, equipment maintenance, administrative staff, and personnel who can handle procurement, revenue, reporting, and service operations. Table 4 shows that this is where the most visible resource bottlenecks occur.

Table 4. Input Evaluation Results

Indicator	Percentage (%)	Category
Vocational teacher competencies	82.3	Good
Availability of practical facilities	79.5	Good
Funding support	71.2	Needs Strengthening
Industry collaboration	81.4	Good
Program support personnel	69.8	Needs Strengthening
Average	76.8	Good

Source: Research Data, 2026

Vocational-teacher competence is Good at 82.3%, industry collaboration is 81.4%, and practical facilities are 79.5%. In contrast, funding support is 71.2% and program support personnel 69.8%, both classified as Needs Strengthening. These two lower indicators help explain why schools may have capable teachers and industry relationships yet still struggle to sustain production units. Teaching Factory studies have repeatedly linked program quality to the availability who can coordinate (Sudiyono, 2020; Wahjusaputri et al., 2020; Safarinah et al., 2022).

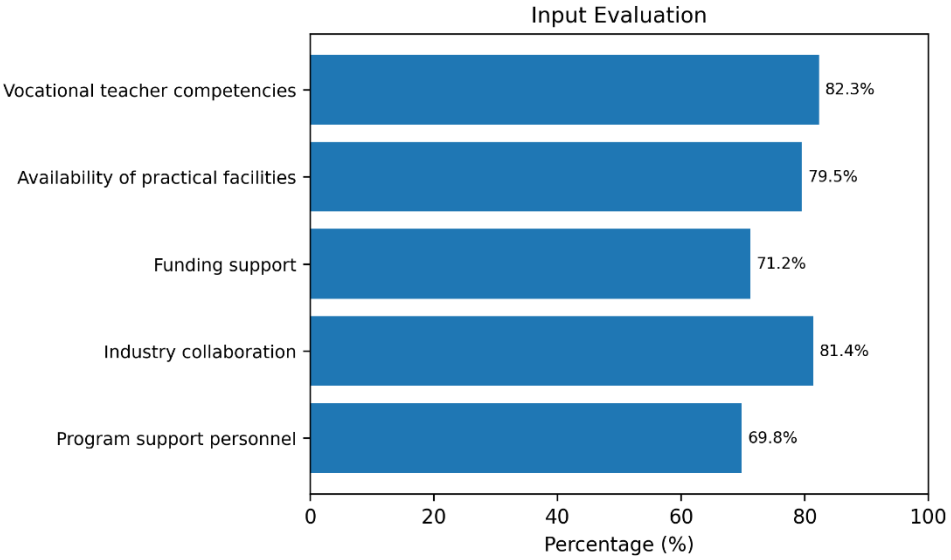


Figure 3. Profile of Input Indicators
Source: Research Data, 2026

The BLUD dimension makes this resource issue more complex because flexibility must be paired with competence in budgeting, accounting, procurement, and accountability. The contrast within the Input component is shown in Figure 3. The chart places teacher competence and industry collaboration beside funding and support-personnel indicators, highlighting the internal imbalance in resource readiness. Figure 3 indicates that the immediate Input problem is not a general shortage of all resources but a concentration of weakness in operational funding and support capacity. This distinction should shape policy design. Across-the-board training or equipment procurement would be less efficient than targeted interventions that identify which schools lack BLUD administrative staff, production-unit coordinators, maintenance capacity, or working capital for job orders. At the same time, digital and professional competence remain important as industry systems evolve; vocational institutions need continuing teacher development that links technical updating with digital and managerial capability (Roll & Ifenthaler, 2021; Hatmojo & Ikhsannudin, 2024).

5. Process: Learning Activity Outpaces Administrative and Monitoring Capacity

Process evaluation concerns what schools actually do with available policy support and resources. The key question is whether industry-based learning and BLUD governance have become routine, monitored, and administratively reliable. Table 5 shows a clear contrast between learning activities and management activities.

Table 5. Process Evaluation Results

Indicator	Percentage (%)	Category
Project-based learning	80.6	Good
Student involvement in production	83.4	Good
BLUD administrative management	72.5	Needs Strengthening
Program monitoring and evaluation	70.7	Needs Strengthening
Average	76.8	Good

Source: Research Data, 2026

Project-based learning is Good at 80.6% and student involvement in production is Good at 83.4%, indicating that schools have made meaningful progress in providing authentic production experiences. However, BLUD administrative management scores 72.5% and monitoring and evaluation 70.7%, both in the Needs Strengthening category. The weakness therefore lies less in student participation than in the systems that make participation governable and sustainable. Similar evaluations report that Teaching Factory can be active at the classroom or workshop level while documentation, scheduling, financial administration, quality control, and evaluation remain underdeveloped (Wijanarka et al., 2023; Yoto et al., 2024). This gap is critical because a Teaching Factory that grows without parallel administrative capacity can create accountability risks and inconsistent service quality.

Figure 4 visualizes the Process gap by comparing the two learning-oriented indicators with the two governance-oriented indicators. The separation provides a direct basis for determining which process reforms should be treated as urgent. The figure supports a two-track improvement strategy. Schools should preserve the strong elements of project-based and production-based learning while simultaneously standardizing BLUD administration and monitoring. Work-integrated learning research suggests that authentic work exposure is most

beneficial when learning objectives, supervision, assessment, and feedback are deliberately structured (Sudarsono et al., 2022; Sudarsono et al., 2024; Tobback et al., 2025).

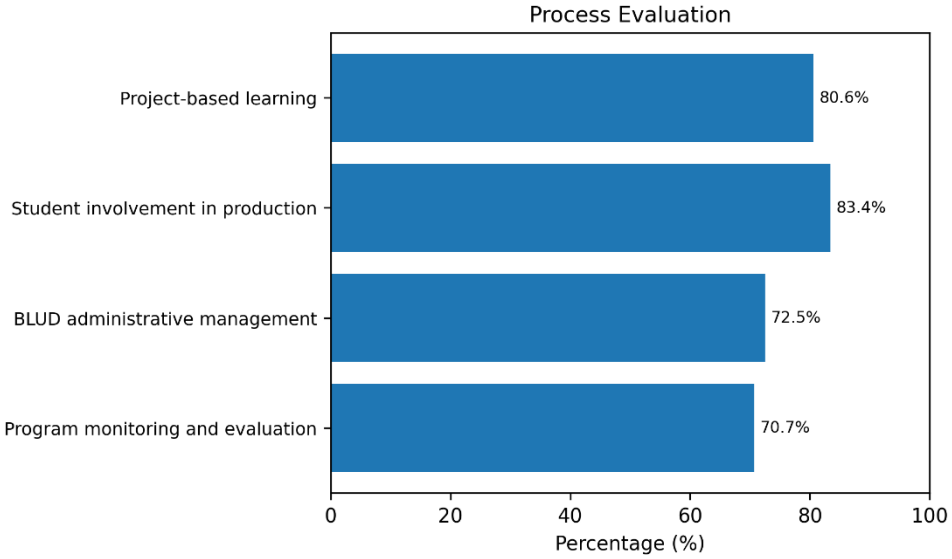


Figure 4. Profile of Process Indicators
Source: Research Data, 2026

For the Kepulauan Riau, the same principle should apply to school production: job orders, revenues, material use, student participation, quality standards, partner contributions, and learning outcomes need to be documented in a common monitoring system.

6. Product: Positive Perceptions Without Causal Attribution

Product evaluation examines the perceived results associated with implementation. Because the study is cross-sectional and lacks baseline or comparison groups, these measures are treated as respondent assessments of program outcomes rather than causal effects. Table 6 presents the four Product indicators under that interpretation.

Table 6. Product Evaluation Results

Indicator	Percentage (%)	Category
Improvement in student competencies	84.6	Good
Quality of industry-based learning	82.7	Good
Development of school production units	78.4	Good
Improvement in industry collaboration	79.1	Good
Average	81.2	Good

Source: Research Data, 2026

Improvement in student competencies is the highest Product indicator at 84.6%, followed by the quality of industry-based learning at 82.7%. Production-unit development is 78.4% and improvement in industry collaboration 79.1%. All are categorized as Good. These findings are consistent with studies showing positive associations between Teaching Factory participation, entrepreneurial orientation, work readiness, and perceived occupational futures (Sutiadiningsih & Mahfud, 2023; Rejeki & Kuat, 2023; Imran et al., 2024). However, the present

design cannot determine how much of the reported improvement is attributable specifically to BLUD or Teaching Factory implementation. Other factors such as student selection, teacher quality, industry placements, school leadership, and prior facilities may contribute.

Figure 5 displays the Product indicators to show that perceived student and learning outcomes are somewhat stronger than institutional development outcomes. This difference is important for sustainability because educational benefits may be difficult to maintain if production units and partnerships remain less mature.

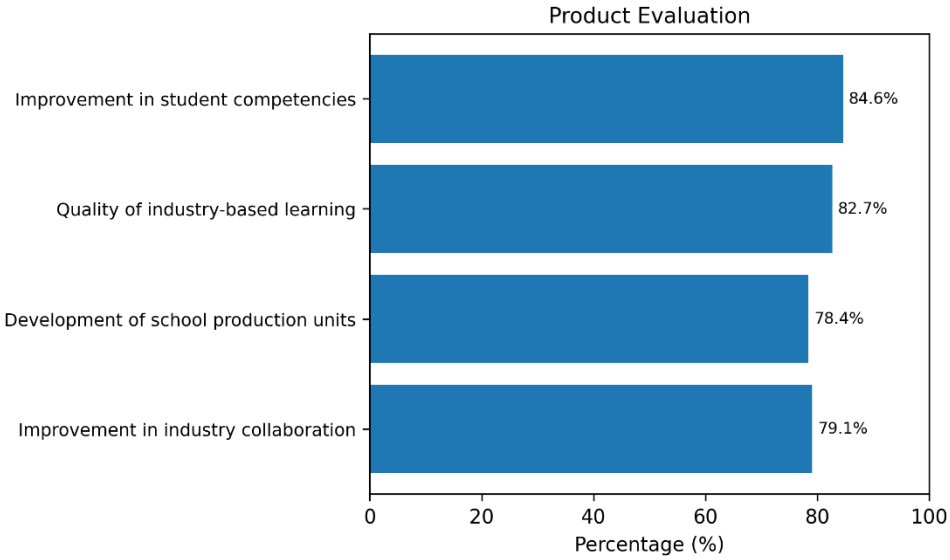


Figure 5. Profile of Product Indicators
Source: Research Data, 2026

The product profile suggests that the next phase of policy should move from demonstrating that Teaching Factory can support student learning toward institutionalizing the mechanisms that keep the model operating. Teaching Factory research increasingly frames the model not only as a pedagogical method but also as an organizational arrangement linking entrepreneurship, production units, and school-industry collaboration (Atiqoh & Gunawan, 2024; Parida et al., 2026). In the Kepulauan Riau, this means that school production units should be treated as learning infrastructure with clear educational objectives, financial rules, partner standards, and reinvestment mechanisms rather than as stand-alone commercial activities.

7. Integrated Policy Diagnosis

Taken together, the CIPP pattern reveals an implementation conversion problem. The province has relatively strong policy legitimacy and perceived educational products, but the enabling mechanism between them is weaker. Input limitations in funding and support personnel feed directly into Process limitations in BLUD administration and monitoring. This relationship explains why the appropriate policy response is not to create another broad statement of support but to strengthen the operational architecture of implementation. The most useful reforms are those that translate existing policy into standard operating procedures, staff roles, financing mechanisms, performance indicators, and school-industry routines. The finding also clarifies the distinctive contribution of integrating BLUD and Teaching Factory analysis. Teaching Factory studies often

emphasize learning design, industry standards, and student competence, while BLUD governance emphasizes financial flexibility and accountability. In practice, the two are interdependent. A production project requires materials and equipment; responsive purchasing requires administrative authority and competent staff; service income requires transparent recording; and reinvestment requires rules that protect educational objectives.

Regional characteristics further strengthen the case for differentiated production units. The Kepulauan Riau do not have a single industrial profile. Batam's manufacturing and logistics environment differs from tourism, marine-resource, service, and local-enterprise opportunities in other islands. Production-unit development should therefore follow local economic potential rather than copy a uniform school-business model. The policy objective is not to turn every vocational high school into the same type of enterprise, but to create industry-connected learning ecosystems whose products and services correspond to each school's expertise and local demand. This orientation is compatible with the broader link-and-match principle that curricula and practical experiences should respond to actual occupational structures (Ariefianto et al., 2025; Khomsah et al., 2025).

8. Policy Alternatives and Priority Sequence

To convert the diagnosis into policy choices, the seven alternatives from the original paper were reorganized into a priority framework. The ranking does not use fabricated cost-benefit numbers; it links actions to the weakest observed indicators and considers feasibility, authority fit, and sustainability. Table 7 summarizes the resulting priority sequence.

Table 7. Priority Framework for BLUD and Teaching Factory Strengthening

Policy Alternative	Evidence Base	Decision Logic
Operational BLUD technical guidance	Weak administration and reporting routines	High feasibility; direct provincial/school authority
Role-specific managerial and technical capacity building	Uneven BLUD management and support personnel	High feasibility; builds implementation capacity
Common monitoring dashboard and periodic review	Monitoring and evaluation score 70.7%	High feasibility; enables longitudinal control
Protected operational financing and support-personnel arrangements	Funding 71.2%; support personnel 69.8%	Requires budget and staffing decisions
School-industry co-governance and curriculum synchronization	Partnership sustainability and stakeholder participation	High strategic value; requires partner commitment
Modernization of industry-based facilities	Need to maintain technology relevance	Capital intensive; should follow governance readiness
Production units based on local economic potential	Need for differentiated regional relevance	High long-term value; requires mature governance

Source: Policy synthesis based on Research Data, 2026

The immediate priorities are operational BLUD guidance, targeted administrative and managerial capacity building, and a routine monitoring system because these actions directly address Process scores in the low seventies and can be initiated through provincial and school governance. Protected operational financing and support-personnel arrangements are also immediate-to-medium priorities because the Input results show that these are persistent constraints. Industry co-governance, facility modernization, and locally differentiated production-unit development remain essential, but they should be sequenced so that new equipment and expanded production do not outpace administrative capability. In other words, institutional capacity should be strengthened before or alongside physical expansion.

Operational guidance should translate BLUD rules into school-level procedures for revenue, expenditure, procurement, remuneration where applicable, inventory, job-order costing, reporting, and reinvestment. The guidance should be written for school users, include workflow diagrams and responsibility matrices, and distinguish educational production from purely commercial activity. Capacity building should then be role-specific: BLUD managers need financial and administrative competence; Teaching Factory coordinators need production planning and quality-control competence; vocational teachers need current technical and work-based-learning competence; and school leaders need partnership and performance-management capability. A generic one-off workshop is unlikely to solve these differentiated needs.

Monitoring should use a small, stable set of indicators that can be compared across schools without creating excessive reporting burden. At minimum, the provincial dashboard should track active industry partners, synchronized curricula, teacher industry exposure, number and type of student production projects, production-unit revenue and reinvestment, equipment utilization, completion of financial reports, audit or review findings, competency-certification participation, and follow-up actions from evaluation. These indicators would make it possible to identify schools that have strong learning activity but weak administration, or sound administration but insufficient industry engagement. A common dashboard would also create the longitudinal evidence that the present study lacks.

Partnership reform should shift from memorandum-based relationships toward co-governance. Industry partners can contribute to curriculum review, assessment standards, guest instruction, teacher internships, student placements, equipment specifications, certification, product quality, and market feedback. Evidence from partnership studies shows that sustained collaboration depends on clear division of responsibilities and periodic evaluation rather than the number of agreements signed (Estriyanto, 2021; Setiawan et al., 2024; Ahmad & Mastiani, 2025). For the Kepulauan Riau, the provincial government can support this shift by creating sector-based partnership forums that connect schools with maritime, manufacturing, tourism, logistics, and service-industry representatives.

Finally, financing and facility modernization should be tied to an explicit development plan for each production unit. Funding should not be limited to equipment acquisition; it should include maintenance, consumables, software, calibration, safety requirements, instructor upgrading, and working capital for supervised production. The strongest cases for investment are those in which the school can demonstrate an aligned curriculum, responsible BLUD administration, a credible industry partner, defined student-learning outcomes, and a market or service need. This sequencing reduces the risk that expensive facilities are

underused and increases the likelihood that public investment produces repeated learning opportunities.

CONCLUSION

This policy paper finds that integrated BLUD and Teaching Factory implementation in the 12 sampled state vocational high schools is broadly in the Good category, with a corrected overall CIPP mean of 79.2%. Context is 82.0%, Input 76.8%, Process 76.8%, and Product 81.2%. The revised calculations resolve inconsistencies in the earlier manuscript and show a clear pattern: policy support, industry alignment, student production involvement, and perceived educational results are relatively strong, while funding support, program support personnel, BLUD administrative management, and monitoring and evaluation are the principal weaknesses. The main policy challenge is therefore implementation conversion - translating supportive policy into sufficient resources and disciplined management routines.

The findings support an integrated rather than fragmented reform strategy. Teaching Factory should not be treated only as a learning model, and BLUD should not be treated only as a financial mechanism. Production-based learning depends on rapid but accountable resource management, competent administrative personnel, clear job-order and reporting procedures, sustainable industry relationships, and monitoring that connects financial performance to educational outcomes. Immediate priorities are operational BLUD technical guidance, role-specific capacity building, protected operational financing, sufficient support personnel, and a common provincial monitoring dashboard. Facility modernization and production-unit expansion should proceed in parallel with, not ahead of, these governance reforms.

The study also makes a methodological contribution by narrowing the claims to what the data can support. The Product scores indicate positive respondent perceptions of student competence and learning quality, but the cross-sectional survey cannot prove that BLUD or Teaching Factory implementation caused those outcomes. The absence of item-level data also prevents retrospective reliability and construct-validity testing. Future provincial evaluations should preserve raw questionnaire data, use documented validation procedures, record respondent roles and response rates, and build a longitudinal dataset that follows schools over multiple implementation cycles. Where feasible, student competency, graduate employment, certification, partner satisfaction, financial performance, and production-unit indicators should be linked to the CIPP survey so that perceived outcomes can be compared with objective measures.

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