DIAJAR: Jurnal Pendidikan dan Pembelajaran
https://journal.yp3a.org/index.php/DIAJAR
e-ISSN 2810-0417 | p-ISSN 2810-0786
Vol. 5 No. 2 (April 2026) 368-374
DOI: 10.54259/diajar.v5i2.6035

The Pilotage Policy Paradox: Competency Gaps and Maritime Education Reform in Indonesia

Anggita Aryati[1], Marihot Simanjuntak[2], Irfan Faozun[3]
[1,2,3]Pemasaran, Inovasi dan Teknologi, Sekolah Tinggi Ilmu Pelayaran Jakarta, North Jakarta, Indonesia
Email: [1]anggitaaryati40@gmail.com

Informasi Artikel
Submitted: 13-11-2025
Accepted: 11-02-2026
Published: 15-04-2026

Keywords:
Competency Gap
Port Governance
Maritime Education
Pilotage Delegation
Qualitative Study

Abstract

Indonesia's policy delegating pilotage services to Port Business Entities (BUPs) aims to enhance efficiency and Non-Tax State Revenue (PNBP). While quantitative Key Performance Indicators (KPIs) at six BUPs show "very good" performance, this qualitative multiple-case study reveals this success as a "façade." Through in-depth interviews with BUP management, regulators (KSOP), and pilots, the research uncovers significant operational friction stemming from critical competency gaps. Although personnel possess high technical proficiency based on STCW standards, they lack essential non-technical skills in commercial law, service management, and public financial governance required by the new delegation policy. The perceived "very good" performance is unsustainably achieved through informal workarounds and individual heroic efforts rather than efficient systemic processes. This study diagnoses the policy-practice gap as a systemic educational failure. The findings provide evidence-based recommendations for urgent curriculum reform in Maritime Education and Training (MET) to integrate critical managerial and administrative competencies. This alignment is essential for transitioning from traditional state-bureaucratic models to modern market-oriented port governance, ensuring that human resource development keeps pace with regulatory evolution in the maritime sector.

1. INTRODUCTION

Bridging the Policy-Practice Gap: A Qualitative Analysis of Competency Gaps in the Implementation of Pilotage Delegation Policy in Indonesia and Its Implications for Maritime Curriculum Development.

The global port industry is currently in an era of fundamental governance transformation, demanding a clear separation between regulatory and operational functions [1]. Indonesia adopted this philosophy through Law No. 17 of 2008 concerning Shipping, which delegates pilotage services to Port Business Entities (BUP) [2]. This policy is expected to improve operational efficiency and optimize Non-Tax State Revenue (PNBP) [3]. However, the effectiveness of service in the field still faces challenges related to suboptimal waiting times [4], [5]. Furthermore, legal uncertainty in the implementation of pilotage services often triggers disputes [6]. Although PNBP contributions appear to increase nominally [7], there is a visible competency gap in the human resources implementing these policies. This study explores how maritime education failures contribute to this policy paradox.

This fragmentation of evidence suggests a deeper problem. The existing literature successfully identifies what is not working---stagnant service performance, legal disputes, and PNBP leakages---but fails to explain why it is happening. There is a glaring research gap in understanding the human and organizational factors underlying these implementation failures. The delegation policy effectively changed the job descriptions of the actors on the ground. A regulator (KSOP) must now shift from being an implementer to a supervisor of commercial contracts. A BUP manager no longer just needs technical maritime competence

(per STCW), but also acumen in commercial law, customer service quality management, and complex public financial administration. The failure to recognize this shift in competency needs---the gap between the new policy's demands and existing competencies---is suspected to be the root cause of the various reported operational frictions.

This competency gap is fundamentally a vocational education challenge. Maritime Education and Training (MET) is a high-stakes vocational sector where the principle of "Link and Match" between curriculum outcomes and industry needs is critical [8]. However, a persistent critique of vocational education globally is its lag in adapting to evolving industry landscapes, often remaining overly focused on technical skill silos at the expense of transversal managerial and administrative competencies [9]. The theory of Work-Integrated Learning (WIL) posits that authentic competence is built through curricula that blend theoretical knowledge with its application in real-world professional contexts, including managerial problem-solving [10]. The current scenario in Indonesian pilotage reveals a stark misalignment: MET institutions continue to excel in producing technically proficient graduates as per STCW standards, but the policy shift has created roles that are hybrid "practitioner-managers." The systemic educational failure, therefore, lies in the curriculum's inability to equip learners with the soft systems skills—such as contractual reasoning, service design, and cross-sectoral financial literacy—required for modern, market-oriented port governance [11].

Therefore, the central research problem of this study is to diagnose the implementation gap of the pilotage delegation policy in Indonesia, not merely as a policy failure, but as a manifestation of a systemic competency gap rooted in vocational curriculum misalignment. This research shifts from the question "is this policy effective?" to "what competencies are lacking that hinder this policy's effectiveness, and how should maritime education reform its curriculum and pedagogy to address this?". The specific objectives are (1) to identify the non-technical competency gaps (e.g., commercial law, public financial administration, service management) experienced by BUP managers and regulatory personnel on the ground; (2) to analyze how these competency gaps manifest as operational frictions, especially concerning Service Quality and PNBP governance; and (3) to formulate evidence-based implications for maritime education curriculum and instructional strategy development.

The significance of this research lies in its novelty in re-framing a port management problem as a human resource development challenge grounded in vocational education theory. In the context of maritime economics, this research is important because it argues that port efficiency and state revenue optimization cannot be achieved solely through regulatory reform; they depend on investment in human competencies aligned with that reform. In the social management context, this study provides critical insights into managing the transition from a state-bureaucratic model to a public-private partnership governance model, highlighting the importance of "organizational learning" for both regulators and operators. To achieve these objectives, this study employs an in-depth qualitative-descriptive methodology.

2. METHOD

This research utilizes a qualitative approach with a multiple-case study design [12], [13]. Data were collected through in-depth interviews with BUP management, regulators (KSOP), and pilots across six different locations. Data analysis was conducted using thematic analysis techniques to identify patterns of competency gaps and operational constraints [14]. Data validity was ensured through source and theory triangulation [15]. The population of this study includes all stakeholders involved in the implementation of the pilotage delegation policy in Indonesia. The research locus sample was purposively determined, covering six Port Business Entities (BUPs) that have received the delegation of authority. Within these six loci, participants were selected using purposive sampling to ensure a triangulation of perspectives from three key informant groups: (1) BUP Management, (2) Regulator representatives (KSOP), and (3) Senior Pilots.

The primary instrument in this research is the researcher themself (human instrument), assisted by a semi-structured interview guide and a document analysis matrix. Data collection was conducted in three steps: document analysis, in-depth interviews, and Focus Group Discussions (FGDs) at each locus. Data analysis followed a systematic thematic analysis framework [14], involving transcription, coding, cross-group comparison, and narrative synthesis.

2.1. Curriculum Gap Analysis Framework

To explicitly address the educational research angle, this study incorporated a systematic Curriculum Gap Analysis as part of its methodological design. The qualitative data on competency gaps (summarized in Table 3) were not merely listed; they were transformed into a framework for learning needs analysis. This process involved two stages:

1. Competency-to-Learning Outcome Mapping: Each identified competency gap (e.g., "Understanding Service Contracts") was deconstructed into specific, measurable learning outcomes required for effective job performance in the new governance model. For instance, the gap in "Public Financial Governance" was mapped to outcomes such as "Ability to reconcile commercial accounting (PSAK) entries with government SAP system codes" and "Ability to interpret profit & loss statements for PNBP compliance auditing."
2. Cross-Referencing with Existing Curriculum: A documentary analysis was performed on a purposively selected sample of current MET curriculum documents for port management and nautical science programs. This analysis aimed to determine if and where the learning outcomes identified above were addressed. The evaluation was not a comprehensive audit of all MET curricula but a targeted comparison between the *demanded competencies* from the field and the *offered content* in a representative curriculum, revealing clear omissions in non-technical modules.

This framework ensures that the recommendations for curriculum reform are directly derived from empirically identified performance gaps, moving beyond general stakeholder perception to a structured needs analysis.

3. RESULTS AND DISCUSSION

3.1 Results and Analysis

The findings indicate that the "Very Good" performance recorded in quantitative KPIs is merely a "façade." Technically, personnel indeed meet STCW standards [13]. However, there is a systemic failure in the managerial and commercial law aspects required in modern port governance models [14]. Efficiency is not achieved through the system, but rather through individual hard work to cover bureaucratic weaknesses. Therefore, a reform of the MET curriculum is necessary, focusing not only on technical navigation but also on port management and public financial governance [15].

3.1.1 The Quantitative Portrait: A Façade of Effectiveness

This research combines a descriptive analysis of operational performance with an in-depth qualitative thematic analysis to uncover the reality behind the implementation of the pilotage authority delegation policy. The findings are presented in two stages: first, a quantitative-descriptive portrait of performance showing superficial success, and second, a qualitative deconstruction of those findings that reveals fundamental competency gaps.

In line with the research direction, the collection of descriptive data from the six Port Business Entities (BUPs) serving as the research loci shows "very good" performance scores. This data was collected from monthly performance reports and PNBP reconciliation reports over the last 12-month period, summarized in Table 1 and Table 2.

Table 1: Descriptive Analysis of Service Quality Performance (Average of 6 BUPs) This table analyzes two main indicators of Service Quality: (1) Service Conformity, the percentage of pilotage and towage services provided on time as requested (SPK); and (2) Average *Waiting Time* (WT), compared to the benchmark before the delegation of authority.

Service Quality Performance Indicator	Indicator Description	Benchmark (Pre-Delegation)	Actual Performance (Post-Delegation)	Score / Assessment
1. Service Conformity	Percentage of services provided on time against total requests (SPK).	~ 85%	94.5%	Very Good
2. Average *Waiting Time*	Average time a ship waits from anchoring (anchorage area) to receiving pilotage service.	120 Minutes	45 Minutes	Very Good
3. Customer Complaint Rate	Number of official written complaints related to pilotage and towage services per 1000 ship movements.	1.2 / 1000	0.3 / 1000	Very Good

Table 1 Analysis: The quantitative-descriptive data above shows a clear picture of success. There is a significant increase in service conformity (up 9.5%), a drastic 75-minute cut in *waiting time* (a 62.5% reduction), and a sharp drop in customer complaints. From a pure *key performance indicator* (KPI) perspective, this delegation policy appears highly effective and efficient, in line with its original goals.

Table 2: Descriptive Analysis of PNBP Governance Performance (Average of 6 BUPs)

This table analyzes two main indicators of PNBP governance: (1) Target Achievement, the percentage of PNBP realization against the set target; and (2) Reconciliation Timeliness, the compliance of BUPs and KSOPs with the monthly reconciliation schedule.

PNBP Performance Indicator	Indicator Description	Benchmark (Pre-Delegation)	Actual Performance (Post-Delegation)	Score / Assessment
1. PNBP Target Achievement	Percentage of realized PNBP deposits against the annual set target.	~ 92%	108.5%	Very Good
2. Reconciliation Timeliness	Percentage of monthly reconciliation processes completed on time (by the 10th of the following month).	30%	95%	Very Good
3. Administrative Disputes	Number of official disputes (written objections) regarding PNBP calculations per year.	5-6 / Year	1-2 / Year	Good

Table 2 Analysis: Similar to Service Quality, the PNBP performance also shows "very good" scores. PNBP realization consistently exceeds targets, and administrative compliance (reconciliation timeliness) has dramatically improved from 30% to 95%.

If this research were to stop at this level of analysis, the conclusion would be simple: the delegation policy has been a resounding success. However, the qualitative findings from in-depth interviews and FGDs with BUP managers, KSOP staff, and pilots tell an entirely different story behind these numbers.

3.1.2 Qualitative Deconstruction: The Reality of Competency Gaps

Thematic analysis of interview transcripts reveals that the "very good" performance is not the result of an efficient system, but rather the result of heroic individual efforts, informal workarounds, and high-friction processes that mask underlying competency gaps.

Theme 1: The Service Quality Paradox – "Effective but Not Efficient" The first qualitative finding to emerge is the "Service Quality Paradox." The low *waiting time* figure (45 minutes) was acknowledged by participants, but its cause was not the new, efficient system.

A Senior Pilot (Locus BUP A) stated:

"That 45-minute data is correct, Sir. But it's not because of the BUP's system. It's because I've been here for 20 years. I know the ships by heart, I know the agents. The BUP's digital SOP often fails. If I followed that SOP, the *waiting time* could be 3 hours. So I just call the ship's captain and the agent directly on my personal WhatsApp. We (the senior pilots) are the ones who 'work around' the system to keep it running."

This finding was supported by a BUP Operations Manager (Locus BUP C):

"Honestly, we are overwhelmed. We were educated as seafarers (technical STCW), and suddenly we have to manage corporate-level supply chain management and customer service. Our KPIs are met [Table 1], but the 'kitchen' is a mess. We depend on the seniority of the pilots in the field, not on the quality management system we designed."

Theme 2: PNBP Governance Friction – "The Façade of Compliance" The second strongest qualitative theme is "PNBP Friction." The data in Table 2 shows 95% compliance and 108.5% target achievement, but interviews reveal this number is achieved through a conflict-ridden and legally risky process.

A BUP Finance Manager (Locus BUP B) explained:

"The 108% target is correct. The 95% compliance is correct. But you must know, every 1st to 10th of the month, it's 'world war'. We (the BUP) use a commercial accounting system (PSAK). The KSOP uses SAP (Government Accounting System). The two don't connect... We spend hundreds of man-hours every month just debating the interpretation of one service item that might not even be worth much. We end up paying (to meet the target) while filing an objection, just so the timeline isn't missed."

A Regulator (KSOP) staff member (Locus D) confirmed this:

"We are required to oversee PNBP, but we were never educated in commercial auditing. We were educated as port administrators. The BUP gives us a profit & loss report, a balance sheet, we are confused reading it. We only know the Government Regulation (PP). A 'competency clash' happens every month. We finally agree [to the reconciliation] for the sake of the schedule, but we know there are many gray areas left unresolved."

Theme 3: Cross-Case Synthesis of Competency Gaps The cross-case analysis of the six BUPs identified clear patterns. The success or failure in managing these paradoxes and frictions heavily depended on management background. BUPs with a purely private corporate background showed a better ability to manage customer service but were extremely frustrated with the PNBP bureaucratic logic. Conversely, BUPs with a public/state-owned background better understood the PNBP bureaucratic flow but were rigid in implementing commercial service management.

These qualitative findings are summarized in Table 3, which is the *true* result of this research. This table maps the Competency Gaps perceived by participants across three crucial non-technical domains identified from the thematic analysis.

Table 3. Qualitative Synthesis of Perceived Competency Gaps (Average of 6 BUPs)

Competency Domain (Variable)	**Qualitative Indicator (Interview Theme)**	**Current Competency Level (Participant Perception)**	**Required Competency Level (Participant Perception)**	**GAP**
1. Technical Pilotage Competency (Baseline)	STCW Compliance, Ship Handling Skills, Navigational Safety.	Very High	Very High	Low
2. Commercial Law Competency (Gap 1)	Understanding Service Contracts, Claims & Dispute Management, BUP Legal Liability.	Low	Very High	Very High
3. Commercial Service Management (Gap 2)	Customer-centric SOP Design, Quality Management (QMS), Supply Chain Thinking.	Low - Medium	Very High	Very High
4. Public Financial Governance (Gap 3)	PNBP Accounting, Government vs. Commercial Reconciliation Procedures, Compliance Auditing.	Very Low	Very High	

Table 3 Analysis: The primary qualitative result of this study is the clear evidence that the Competency Gap is Low in the Technical domain (the area traditionally taught in maritime education). However, Very High gaps emerge in the three *new* domains (Commercial Law, Service Management, and Public Finance) created directly by the delegation policy itself.

3.2 Discussion

This discussion critically analyzes the paradoxical findings above, connects them back to the research questions, fills literature gaps, and outlines the practical implications, especially for maritime education.

3.2.1 Answering the Research Questions: The Competency Paradox

The central research question focused on diagnosing the implementation gap as a manifestation of a competency gap. Our findings comprehensively answer this.

First, the research confirms the existence of significant competency gaps (RQ1). More importantly, the findings localize these gaps not in the technical (STCW) areas governed by the Maritime Scholars Institute (2025), but in the managerial-administrative areas (Table 3). The delegation policy fundamentally changed the role of maritime practitioners from *technical operators* to *socio-economic managers*, while their education and training systems have not yet adapted.

Second, the research explains *how* these gaps manifest (RQ2). Our findings show a paradoxical manifestation. Quantitatively (Table 1 & 2), the policy appears "very good," aligning with expectations of efficiency (Pian et al., 2020). However, qualitatively, we found this effectiveness to be fragile. Success is not driven by the system, but by "individual heroes" and "informal workarounds" who use social capital (20 years of experience) to cover for systemic failures. This is a hidden form of organizational inefficiency;

the system expends resources (managerial time, conflict) to achieve superficial compliance. The "competency clash" phenomenon (commercial vs. public accounting) is a specific finding that explains *why* PNBP friction occurs.

3.2.2 4.2. Filling the Literature Gaps

These findings fill several critical gaps in the Indonesian port literature.

Previous studies focusing on Service Quality [4], [5] have identified *waiting time* as a key performance metric. However, they tend to treat *waiting time* as a technical-operational end-result. Our research contributes by demonstrating that *waiting time* in the post-delegation era is a reflection of service management competency and commercial SOP design effectiveness, no longer purely the pilot's ship-handling skill. We show the danger of relying on quantitative KPIs (Table 1) without understanding the qualitative processes behind them.

Similarly, legal studies [6] and financial studies [7] have identified the existence of *disputes* and *PNBP contribution challenges*. Our research fills the gap by shifting the analysis from *what* the dispute is (the legal domain) to *why* the dispute occurs (the competency domain). Our "competency clash" finding suggests this is not purely a legal problem, but a problem of "legal-financial literacy" among the implementers.

3.2.3 Practical Implications: From Curriculum Content to Pedagogical Strategy

The primary strength of this research lies in its triangulated, qualitative multiple case study design, which uncovered the "Effectiveness Paradox." The practical implications extend beyond identifying *what* to teach, to proposing *how* to teach and institutionalize these new competencies.

1. For Maritime Education Institutions (METs): Curriculum and Pedagogy Reform. The findings mandate a dual reform: content integration and pedagogical innovation. New modules must address the gaps in Table 3:
    a. Applied Maritime Commercial Law & Contracts should be taught using Case-Based Learning (CBL). Instructors can use anonymized real disputes from the research as cases. Students, acting as BUP managers or KSOP regulators, analyze contractual clauses, relevant sections of Law No. 17/2008, and develop mitigation strategies, fostering legal reasoning and negotiation skills [16].
    b. Port Service & Operations Quality Management is ideally suited for Project-Based Learning (PjBL). Student teams can be tasked with designing a digital SOP for pilotage dispatch to reduce *waiting time*, requiring them to integrate knowledge of ship operations, customer needs, and IT systems, thereby developing systemic service design thinking [17].
    c. Public Financial Governance & PPPs can be effectively taught through Simulation and Role-Play. A simulation software or spreadsheet-based model replicating the PSAK-SAP reconciliation clash allows students to experience the friction points. Role-playing reconciliation meetings builds competency in interdisciplinary communication and regulatory compliance [18]. This shift requires faculty development in active learning methodologies and partnerships with industry to provide authentic case materials.
2. For the Regulator and Industry: Fostering Organizational Learning. Curriculum reform addresses future graduates, but a parallel Organizational Learning initiative is needed for current practitioners [19]. The recommended "Competency Gap Audit" and "transitional training program" should employ blended learning models. Micro-learning modules on specific topics (e.g., "Reading a BUP Balance Sheet for Regulators") can be delivered online, followed by communities of practice workshops where BUP and KSOP staff jointly solve real monthly reconciliation problems facilitated by a neutral expert. This creates a continuous learning loop that reduces friction and institutionalizes new practices.

3.2.4 Limitations and Future Research Direction

Future research should: First, use the qualitative findings (Table 3) to design a **nationwide quantitative survey** to measure the prevalence of these gaps. Second, conduct **design-based research** [20] in collaboration with an MET to develop, implement, and evaluate the proposed CBL/PjBL modules, measuring their impact on student competency before graduation.

4. CONCLUSION

This study concludes that Indonesia's pilotage delegation policy, while appearing "very good" on quantitative performance metrics, suffers from a deep and unsustainable implementation paradox rooted in a vocational education mismatch. Our qualitative case study reveals this success is a fragile façade, achieved

despite systemic friction caused by critical competency gaps in commercial law, service management, and public financial governance. This research re-frames the problem as an urgent educational failure. Its primary contribution is providing evidence-based recommendations for a dual reform in Maritime Education and Training (MET): the integration of new managerial content *and* the adoption of active pedagogical strategies like Case-Based and Project-Based Learning, alongside fostering organizational learning for current practitioners, to truly align human resource development with modern port governance realities.

REFERENCES

[1] Munim, Z. H., Saeed, N., & Larsen, O. I. (2022). "Port governance revisited: How to govern and for what purpose?" Transport Policy, 115, 1-13. https://doi.org/10.1016/j.tranpol.2021.10.013

[2] Undang-Undang Republik Indonesia Nomor 17 Tahun 2008 tentang Pelayaran.

[3] Chen, J., Zhang, W., & Wang, Y. (2020). "Efficiency evaluation of public-private partnership port projects in China based on DEA-Tobit model." Maritime Policy & Management, 47(8), 1061-1077.

[4] Sitorus, M. (2023). "Analisis Kinerja Pelayanan Pemanduan dan Pelayanan Jasa Kapal Berdasarkan Waiting Time dan Approach Time di Pelabuhan Tanjung Priok." Jurnal Ilmiah Teknologi dan Manajemen Pelabuhan, 5(2), 45-60.

[5] Nugroho, A., & Putra, R. D. (2021). "Evaluasi Kinerja Pelayanan Pemanduan Kapal di Pelabuhan Tanjung Perak Pasca Pendelegasian Wewenang." Jurnal Manajemen Transportasi & Logistik, 8(3), 289-300.

[6] Wibowo, S., & Haryanto, J. T. (2024). "Analisis Yuridis Sengketa Tarif Jasa Pemanduan Kapal Antara Otoritas Pelabuhan dan Badan Usaha Pelabuhan." Jurnal Hukum Bisnis, 22(1), 77-92.

[7] Astuti, R., & Santoso, D. B. (2022). "Optimalisasi PNBP Sektor Kepelabuhanan: Studi pada Pelayanan Pemanduan di BUP X." Jurnal Ekonomi dan Kebijakan Publik, 13(2), 155-170.

[8] Paryati, P., & Sudira, P. (2020). "The implementation of 'link and match' in vocational education: A case study in Indonesia." Journal of Vocational Education Studies, 3(2), 78-89.

[9] Pilz, M., & Li, J. (2020). "Permeability between VET and higher education: A comparative study of China and Germany." International Journal for Research in Vocational Education and Training (IJRVET), 7(2), 182-203.

[10] Zegwaard, K. E., & Hoskyn, K. (2021). "Research informed curriculum and advancing work-integrated learning." In The Routledge International Handbook of Work-Integrated Learning (3rd ed., pp. 15-30). Routledge.

[11] Notteboom, T., Pallis, A., & Rodrigue, J. P. (2022). Port economics, management and policy. Routledge.

[12] Creswell, J. W., & Poth, C. N. (2018). Qualitative inquiry and research design: Choosing among five approaches (4th ed.). Sage Publications.

[13] Yin, R. K. (2024). Case study research and applications: Design and methods (7th ed.). Sage Publications.

[14] Braun, V., & Clarke, V. (2022). Thematic analysis: A practical guide. Sage Publications.

[15] Flick, U. (2022). The SAGE handbook of qualitative research design. Sage Publications.

[16] Thistlethwaite, J. E., Davies, D., & Ekeocha, S. (2020). "The effectiveness of case-based learning in health professional education: A BEME systematic review." Medical Teacher, 42(2), 157-164.

[17] Kokotsaki, D., Menzies, V., & Wiggins, A. (2019). "Project-based learning: A review of the literature." Improving Schools, 22(3), 267-277.

[18] Alinier, G., & Oriot, D. (2022). "Simulation-based education in healthcare: The past, the present, and the future." Advances in Simulation, 7(1), 1-3.

[19] Örtenblad, A. (2020). The Oxford handbook of the learning organization. Oxford University Press.

[20] McKenney, S., & Reeves, T. C. (2023). Conducting educational design research (2nd ed.). Routledge.