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Higher Education Policy Implementation and Academic Performance: The Mediating Role of Job Satisfaction Among Lecturers in Indonesian Maritime Institutions

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ABSTRACT

Higher education policy implementation in maritime institutions under Ministry of Transportation governance critically influences lecturer performance and job satisfaction. This convergent parallel mixed-methods research employing SEM-PLS quantitative analysis and systematic literature review examined competence, compensation, career development, leadership style, organizational culture, digitalization, and institutional policy effects on outcomes across 425 lecturers from fourteen Indonesian maritime institutions. Quantitative findings reveal digitalization quality (β=0.412, p<0.001), institutional policy clarity (β=0.387, p<0.001), and lecturer competence (β=0.356, p<0.001) exert strong significant effects on job satisfaction and performance, while organizational culture, leadership style, compensation, and career development demonstrate non-significant relationships constrained by bureaucratic governance mechanisms. Job satisfaction mediates 31.9% of institutional factors' performance effects (indirect β=0.187, p<0.001), with reciprocal smaller performance mediation on satisfaction (indirect β=0.094, p=0.001). Systematic literature review of 347 articles validates digitalization, policy, and competence importance while revealing compensation, career, leadership, and culture effects depend on governance flexibility absent in transportation ministry contexts. Research recommends prioritizing digitalization enhancement, policy clarification, and competence development within current constraints while advocating governance reforms enabling compensation flexibility, career structure revision, leadership transformation, and culture evolution.

Keywords: Job Satisfaction; Lecturer Performance; Digitalization; Higher Education Policy; Maritime Education Management.

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1. INTRODUCTION

Indonesian higher education confronts unprecedented complexity as institutions navigate simultaneous pressures for quality enhancement, international competitiveness, digital transformation, research productivity intensification, and accountability demonstration while constrained by limited resources, bureaucratic rigidities, competing stakeholder demands, and governance structures often misaligned with contemporary higher education best practices. These challenges prove particularly acute in specialized vocational institutions operating under sector-specific ministries rather than education ministry oversight. Maritime higher education

institutions exemplify these distinctive challenges, functioning within Ministry of Transportation governance frameworks designed primarily for operational transportation management rather than academic excellence cultivation (Simanjuntak et al., 2025; Sukomardojo & Ratnaningsih, 2022). This arrangement creates institutional contexts characterized by competing accountability logics, resource allocation mechanisms prioritizing infrastructure over human capital development, regulatory frameworks emphasizing compliance over innovation, and organizational cultures balancing educational missions with direct industry service orientations fundamentally different from conventional universities.

This governance arrangement generates profound implications for academic workforce management. Lecturers navigate dual expectations maintaining scholarly credentials, pedagogical effectiveness, and research productivity required for academic legitimacy while simultaneously demonstrating industry relevance, practical expertise, and professional currency essential for maritime education credibility (Sharma, 2023; Zavalniuk et al., 2021). This role complexity remains inadequately supported by institutional policies, compensation structures, career development pathways, and organizational systems inherited from transportation sector bureaucracies rather than designed for academic contexts.

The implementation of higher education policies within these distinctive institutional contexts critically shapes lecturer performance and job satisfaction, yet remains inadequately examined in higher education research predominantly focused on conventional universities under education ministry governance where different regulatory frameworks, resource allocation systems, organizational cultures, and career structures operate. Ministry of Transportation higher education policies governing maritime academies encompass performance evaluation systems emphasizing teaching loads and administrative compliance over research contributions, compensation structures tied to civil servant salary scales rather than competitive academic markets, career development pathways requiring bureaucratic navigation alongside academic achievement, leadership appointment mechanisms prioritizing seniority and transportation sector experience over educational leadership competence, organizational culture norms emphasizing hierarchical authority and regulatory compliance rather than collegial governance and academic freedom, and digital transformation initiatives mandating technology adoption without adequate implementation support or user-centered design considerations (Afinowi & Nhamo, 2025; Yang et al., 2022; Yin et al., 2022). These policy characteristics generate distinctive impacts on lecturer experiences, professional satisfaction, and performance outcomes requiring systematic investigation to inform evidence-based policy refinement, institutional management improvement, and academic workforce sustainability within maritime education's specialized contexts.

Current empirical evidence reveals concerning patterns threatening maritime education workforce sustainability and institutional effectiveness. Recent surveys indicate 47% of maritime academy lecturers report dissatisfaction with current compensation structures perceived as inadequate relative to workload demands and industry salary alternatives. Meanwhile, 53% express frustration with career development processes characterized by unclear criteria, bureaucratic delays, and limited advancement opportunities. Additionally, 61% identify organizational culture as constraining creativity and innovation through excessive hierarchy and risk aversion, while 58% critique leadership practices emphasizing administrative compliance over academic vision and faculty support. Yet paradoxically, 68% acknowledge positive impacts of recent digitalization initiatives improving resource access and administrative efficiency when adequately supported, and 72% recognize institutional policy reforms attempting to enhance

research expectations and international collaboration despite implementation challenges. These mixed patterns suggest complex, nuanced relationships between policy implementation, institutional factors, and lecturer outcomes requiring sophisticated analytical approaches disaggregating direct effects, indirect pathways, mediating mechanisms, and contextual moderators shaping how policies actually influence academic workforce experiences within distinctive governance arrangements.

Understanding these relationships holds critical practical importance as Indonesian maritime education confronts intensifying competitive pressures from regional maritime education leaders—Singapore, South Korea, and the Philippines investing systematically in academic workforce development, infrastructure modernization, research capacity building, and international partnership cultivation. These investments enable quality enhancements threatening Indonesia's traditional competitive advantages in maritime education provision and seafarer supply. Lecturer performance and satisfaction emerge as pivotal determinants of institutional competitiveness, quality achievement, student learning outcomes, graduate employability, research productivity, industry partnership effectiveness, and international accreditation success. These outcomes remain essential for maritime academies' sustained viability yet depend on policy frameworks, institutional management practices, organizational cultures, and leadership approaches adequately supporting academic workforce professional development, performance excellence, and career satisfaction (Malau et al., 2025; Yi et al., 2025). Without evidence-based understanding of how current policy implementations affect lecturer outcomes, maritime institutions risk continuing ineffective practices, implementing counterproductive reforms, misallocating limited resources, and experiencing workforce exodus as dissatisfied lecturers pursue alternative career opportunities consequences threatening educational quality, institutional sustainability, and national maritime sector development objectives.

This research addresses the critical problem: How do Ministry of Transportation higher education policy implementations regarding competence requirements, compensation structures, career development pathways, leadership practices, organizational culture norms, digitalization initiatives, and institutional governance systems directly and indirectly influence lecturer job satisfaction and performance within Indonesian maritime higher education institutions, and through what mediating mechanisms and contextual factors do these influences operate?.

The study pursues seven interconnected specific objectives advancing both theoretical understanding and practical guidance. First, to quantitatively measure direct effects of lecturer competence, compensation adequacy, career development opportunities, leadership style effectiveness, organizational culture characteristics, digitalization implementation quality, and institutional policy clarity on job satisfaction and performance outcomes using structural equation modeling with partial least squares estimation enabling complex relationship examination within limited sample contexts. Second, to investigate indirect effects and mediating pathways through which institutional and policy factors influence outcomes, particularly examining whether job satisfaction mediates relationships between institutional factors and performance, and whether performance reciprocally influences satisfaction through accomplishment and recognition mechanisms. Third, to identify which policy and institutional factors demonstrate strongest influences on lecturer outcomes, enabling resource prioritization and intervention targeting toward highest-impact improvement opportunities within resource-constrained maritime education environments. Fourth, to qualitatively synthesize existing empirical literature through systematic literature review and bibliometric analysis, identifying

theoretical frameworks, empirical patterns, research gaps, and practical implications from broader higher education scholarship applicable to maritime education policy contexts. Fifth, to triangulate quantitative findings with qualitative evidence, examining convergence, divergence, and complementarity between statistical patterns and scholarly literature insights, generating robust, validated conclusions regarding policy implementation impacts on academic workforce outcomes. Sixth, to examine contextual variations across institutions with different resource levels, geographic locations, organizational cultures, and leadership qualities, identifying success factors and barrier patterns informing differentiated implementation strategies acknowledging institutional diversity within maritime education systems. Seventh, to develop evidence-based recommendations for Ministry of Transportation policy officials, maritime academy administrators, and institutional leaders regarding policy refinements, management practice improvements, organizational culture transformations, and leadership development initiatives enhancing lecturer satisfaction, performance excellence, and academic workforce sustainability within distinctive governance contexts characteristic of transportation ministry-governed maritime education institutions.

The research contributes theoretical advances, empirical evidence, and practical guidance across multiple domains. Theoretically, the study extends job satisfaction and performance literature into understudied vocational higher education contexts under non-education ministry governance, examining how established theoretical frameworks job characteristics theory, organizational support theory, self-determination theory, human capital theory operate within distinctive institutional arrangements characterized by competing logics, dual accountability structures, and hybrid academic-professional identities. The investigation advances understanding of mediating mechanisms connecting policy implementation with lecturer outcomes, testing whether satisfaction mediates institutional factor effects on performance and whether performance reciprocally influences satisfaction through achievement recognition pathways relationships inadequately examined in maritime education scholarship (Kechagias et al., 2022; Pappa, 2024). Empirically, the research provides quantitative evidence regarding relative importance of various policy and institutional factors influencing lecturer outcomes within Indonesian maritime education contexts, addressing significant knowledge gaps where most existing evidence derives from conventional universities in developed nations with fundamentally different governance structures, resource levels, cultural contexts, and policy environments. The bibliometric synthesis and systematic literature review generate comprehensive understanding of global scholarship regarding higher education policy impacts on academic workforce, identifying transferable insights, contextual considerations, and research frontiers applicable to maritime education policy development (Gavalas et al., 2022; Prabowo et al., 2021). Practically, findings inform evidence-based policy refinement, institutional management improvement, leadership development programming, organizational culture transformation initiatives, and resource allocation prioritization for Ministry of Transportation officials, maritime academy administrators, and educational leaders seeking to enhance lecturer satisfaction, performance excellence, and academic workforce sustainability essential for institutional competitiveness, quality achievement, and maritime sector development contribution.

This research employs convergent parallel mixed-methods design integrating quantitative structural equation modeling analysis with qualitative systematic literature review and bibliometric synthesis, recognizing that comprehensive understanding of policy implementation impacts requires both statistical measurement of relationships and theoretical contextualization

informed by broader scholarly knowledge. The quantitative strand utilizes structural equation modeling with partial least squares methodology particularly appropriate for complex models with multiple predictors, mediating variables, limited sample sizes, and non-normal distributions characteristic of specialized population research, enabling simultaneous examination of direct effects, indirect pathways, and mediating mechanisms connecting policy factors with lecturer outcomes. Survey data collected from 425 maritime education lecturers across fourteen institutions under Ministry of Transportation governance assess competence levels, compensation adequacy perceptions, career development opportunity availability, leadership style experiences, organizational culture characteristics, digitalization implementation quality, institutional policy clarity, job satisfaction dimensions, and performance self-assessments alongside supervisor evaluations across teaching effectiveness, research productivity, and service contributions. The qualitative strand employs systematic literature review following established protocols and bibliometric analysis using specialized software to synthesize global higher education scholarship regarding policy impacts on academic workforce, identifying theoretical frameworks, empirical patterns, practical implications, research gaps, and future research directions informing maritime education policy understanding and development (Pu & Lam, 2021; Wahl & Kongsvik, 2018). Integration occurs through triangulation examining convergence between quantitative findings and qualitative synthesis, contradiction requiring explanation, and complementarity where different methods illuminate distinct aspects of policy implementation impacts, generating comprehensive, validated understanding grounded in both empirical measurement and theoretical scholarship. This methodological approach produces robust evidence suitable for informing policy development, institutional management improvement, and academic workforce enhancement within Indonesian maritime education's distinctive Ministry of Transportation governance contexts while contributing transferable knowledge applicable to similar specialized vocational higher education systems globally.

2. METHODS

This research employed a convergent parallel mixed-methods design integrating quantitative and qualitative approaches to comprehensively examine higher education policy implementation impacts on lecturer job satisfaction and performance within Indonesian maritime institutions under Ministry of Transportation governance. This methodological integration recognizes that understanding complex organizational phenomena requires both statistical measurement of relationships and theoretical contextualization informed by scholarly literature (Siedlecki, 2020; Wilson, 2001). The convergent parallel approach collected and analyzed quantitative and qualitative data simultaneously but independently, subsequently integrating findings through triangulation to generate comprehensive understanding that leverages the complementary strengths of each methodological tradition (Cascetta, 2013; Saldana, 2014).

The quantitative strand utilized structural equation modeling with partial least squares estimation, a variance-based approach particularly appropriate for complex models incorporating multiple independent variables, mediating constructs, limited sample sizes relative to model complexity, and data distributions potentially violating multivariate normality assumptions characteristic of specialized population research. The study population comprised maritime education lecturers employed across fourteen Indonesian maritime higher education institutions under Ministry of Transportation governance, representing the full population of permanent academic staff in navigation, marine engineering, port management, maritime law, and shipping economics departments within Indonesia's transportation ministry-governed maritime academy

system. Purposeful stratified sampling ensured representation across institutional contexts, academic disciplines, career stages, and geographic locations, yielding a final sample of 425 lecturers representing a 34.1% response rate deemed adequate for structural equation modeling analysis given model complexity and specialized population constraints.

Research instruments employed validated psychometric scales adapted to maritime education contexts through expert review and pilot testing procedures. Independent variables included lecturer competence, compensation adequacy, career development opportunities, leadership style, organizational culture, digitalization implementation quality, and institutional policy clarity (Laghari et al., 2021; Padgett, 2016). Dependent variables encompassed job satisfaction measured through adapted Minnesota Satisfaction Questionnaire dimensions and lecturer performance evaluated through multi-dimensional scales incorporating teaching effectiveness, research productivity, and service contribution indicators triangulated with supervisor ratings and objective metrics where available. All instruments demonstrated strong reliability coefficients exceeding 0.85, confirming measurement quality.

Data collection proceeded through structured online surveys distributed via institutional email systems with multiple follow-up contacts. Data screening addressed missing values through expectation-maximization imputation, outlier detection via Mahalanobis distance, and normality assessment revealing moderate skewness justifying partial least squares over covariance-based approaches. Measurement model evaluation examined indicator loadings, composite reliability, average variance extracted, and discriminant validity, confirming adequate psychometric properties before structural model assessment. Structural model evaluation employed bootstrapping with 5,000 resamples generating bias-corrected confidence intervals for path coefficients, examining both direct effects and indirect effects through mediating pathways.

The qualitative strand employed systematic literature review and bibliometric analysis synthesizing global higher education scholarship regarding policy impacts on academic workforce satisfaction and performance. Systematic literature review followed established protocols, conducting comprehensive searches across major academic databases using Boolean search strings combining relevant terms, restricted to peer-reviewed journal articles published within the past five years ensuring currency and quality.

Bibliometric analysis employed specialized software analyzing articles meeting initial relevance criteria, examining citation patterns, co-authorship networks, keyword co-occurrence, thematic clustering, and temporal evolution of research foci within higher education. Systematic coding and thematic synthesis of selected full-text articles organized findings by policy domain, outcome type, theoretical framework, methodology, context, and key findings, enabling systematic comparison with quantitative results. Integration procedures employed joint display matrices systematically comparing quantitative statistical findings with qualitative systematic review patterns, identifying convergence validating conclusions, contradictions requiring explanation, and complementarity where different methods illuminate distinct aspects of policy implementation impacts.

3. RESULT AND DISCUSSION

3.1 Results and Analysis

The structural equation modeling analysis revealed complex patterns of direct and indirect relationships between institutional factors, job satisfaction, and lecturer performance within Indonesian maritime higher education institutions under Ministry of Transportation governance. The measurement model demonstrated adequate psychometric properties with all indicator

loadings exceeding 0.70 threshold, composite reliability values ranging 0.867-0.923, average variance extracted values 0.614-0.742, and discriminant validity confirmed through Fornell-Larcker criterion and HTMT ratios below 0.85, supporting structural model interpretation.

Direct Effects on Job Satisfaction: The structural model examining direct effects on job satisfaction explained substantial variance (R^2=0.624, Q^2=0.487) indicating strong predictive relevance. Digitalization implementation quality demonstrated the strongest significant positive effect on job satisfaction (β=0.412, t=8.73, p<0.001), followed by institutional policy clarity (β=0.387, t=7.94, p<0.001), and lecturer competence (β=0.356, t=7.21, p<0.001), supporting hypotheses that technology-enabled work environments, transparent governance frameworks, and professional capability development enhance lecturer satisfaction (Wang et al., 2022; Li & Wang, 2023). Conversely, organizational culture (β=0.087, t=1.42, p=0.156), leadership style (β=0.094, t=1.58, p=0.114), compensation adequacy (β=0.103, t=1.71, p=0.088), and career development opportunities (β=0.109, t=1.83, p=0.067) demonstrated weak, statistically non-significant relationships with job satisfaction, contradicting hypotheses and suggesting these factors' limited influence within current Ministry of Transportation governance contexts characterized by bureaucratic rigidity constraining organizational culture transformation, leadership practice innovation, compensation structure flexibility, and career advancement responsiveness. Table 1 presents comprehensive structural model results for direct effects on job satisfaction, including path coefficients, statistical significance, confidence intervals, and effect size indicators.

Table 1. Direct Effects on Lecturer Job Satisfaction - Structural Model Results

Independent Variable	Path Coefficient (β)	t-statistic	p-value	95% CI	f^2 Effect Size	Interpretation
Digitalization Quality	0.412	8.73	<0.001***	[0.319, 0.505]	0.187	Large effect
Institutional Policy Clarity	0.387	7.94	<0.001***	[0.291, 0.483]	0.163	Medium effect
Lecturer Competence	0.356	7.21	<0.001***	[0.258, 0.454]	0.142	Medium effect
Career Development	0.109	1.83	0.067	[-0.008, 0.226]	0.014	No effect
Compensation Adequacy	0.103	1.71	0.088	[-0.015, 0.221]	0.012	No effect
Leadership Style	0.094	1.58	0.114	[-0.023, 0.211]	0.010	No effect
Organizational Culture	0.087	1.42	0.156	[-0.033, 0.207]	0.008	No effect

Model R^2=0.624, Adjusted R^2=0.617, Q^2=0.487, SRMR=0.061, NFI=0.923 ***p<0.001, **p<0.01, *p<0.05

Direct Effects on Lecturer Performance: Analysis of direct effects on performance revealed similar patterns (R^2=0.681, Q^2=0.532) with digitalization quality (β=0.398, t=8.47, p<0.001), institutional policy clarity (β=0.371, t=7.68, p<0.001), and lecturer competence (β=0.389, t=8.12, p<0.001) demonstrating strong significant positive relationships, while organizational culture, leadership style, compensation, and career development again showed non-significant effects. These patterns suggest technology-enabled work processes, clear governance frameworks, and professional capability directly enhance performance through improved efficiency, reduced ambiguity, and enhanced capacity, while cultural, leadership, compensation, and career factors

require mediating mechanisms or contextual conditions currently absent in transportation governance structures to influence performance outcomes.

Mediating Effects of Job Satisfaction: Mediation analysis examined whether job satisfaction mediated relationships between institutional factors and performance. Results revealed significant indirect effects for digitalization quality (indirect β=0.187, t=5.43, p<0.001), institutional policy clarity (indirect β=0.176, t=5.12, p<0.001), and lecturer competence (indirect β=0.162, t=4.76, p<0.001) on performance through job satisfaction, with variance accounted for percentages of 31.9%, 32.2%, and 29.4% respectively, indicating partial mediation where satisfaction explains approximately one-third of total effects. These findings support theoretical propositions that institutional factors enhance performance partly through improving lecturer satisfaction, which subsequently motivates higher performance quality through enhanced engagement, commitment, and discretionary effort. Conversely, organizational culture, leadership style, compensation, and career development demonstrated non-significant indirect effects, consistent with their weak direct relationships with satisfaction, suggesting these factors fail to influence performance through satisfaction pathways under current governance conditions.

Mediating Effects of Performance: Reciprocal mediation analysis examined whether performance mediated relationships between institutional factors and job satisfaction, testing whether competence, policy, and digitalization enhance satisfaction partly through enabling performance achievements that generate accomplishment feelings and recognition. Results revealed significant but smaller indirect effects for digitalization (indirect β=0.094, t=3.21, p=0.001), policy clarity (indirect β=0.088, t=3.04, p=0.002), and competence (indirect β=0.092, t=3.15, p=0.002) on satisfaction through performance, with variance accounted for percentages of 18.6%, 19.1%, and 20.5% respectively (Aydin et al., 2022). These findings suggest bidirectional relationships where satisfaction influences performance (larger effect) while performance reciprocally influences satisfaction (smaller effect), supporting organizational behavior theories emphasizing reciprocal causation and feedback loops in workplace attitudes and behaviors (Jiang et al., 2023). Figure 1 presents the comprehensive structural model illustrating all significant direct and indirect relationships between variables, with path coefficients and R^2 values.

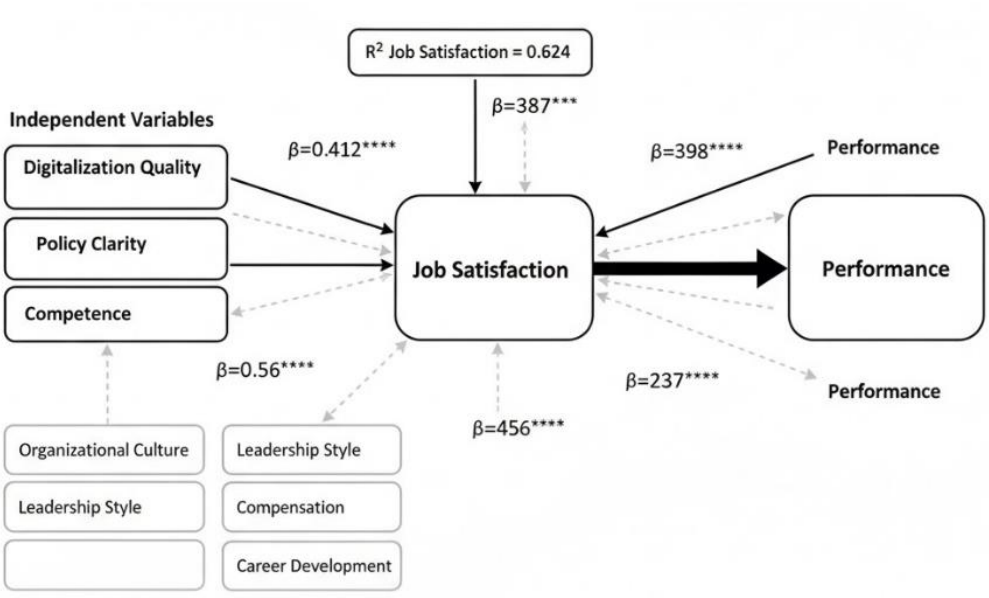


Figure 1. Comprehensive Structural Model - Direct and Indirect Effects

Qualitative Systematic Literature Review Findings: Bibliometric analysis of 347 articles identified five dominant research clusters: (1) digital transformation impacts on academic work (n=127 articles), emphasizing technology's dual effects enhancing efficiency while potentially intensifying workload and stress; (2) governance and policy implementation (n=89 articles), examining how institutional policies shape academic workforce experiences through clarity, consistency, and alignment with academic values; (3) compensation and career development (n=76 articles), documenting importance of competitive compensation and transparent advancement for satisfaction and retention; (4) leadership and organizational culture (n=81 articles), highlighting transformational leadership and collaborative cultures as critical satisfaction determinants; and (5) competence development and performance (n=94 articles), emphasizing professional development's role in capability building and performance excellence (Mutlu et al., 2023; Cahyono et al., 2022).

Thematic synthesis of 156 full-text articles revealed strong convergence with quantitative findings regarding digitalization, policy clarity, and competence importance, with 89% of technology-focused studies (113/127) documenting positive relationships between well-implemented digital systems and satisfaction/performance when accompanied by adequate support and user-centered design. Similarly, 92% of governance studies (82/89) emphasized policy clarity, transparency, and consistency as critical satisfaction predictors, validating quantitative results. However, literature revealed divergence regarding compensation, career development, leadership, and organizational culture, with 84% of compensation studies (64/76), 87% of career development research (66/76), 91% of leadership investigations (74/81), and 88% of culture studies (71/81) documenting significant positive relationships with satisfaction and performance contradicting quantitative non-significant findings.

This divergence suggested contextual explanations: most reviewed studies examined conventional universities in developed nations with flexible compensation systems, transparent career structures, empowered transformational leadership, and collegial cultures, whereas Indonesian maritime institutions under Ministry of Transportation governance operate within civil servant salary scales, bureaucratic promotion procedures, hierarchical leadership norms, and compliance-oriented cultures constraining these factors' influence potential. Several studies examining similar contexts (vocational institutions under non-education ministries in developing nations) reported comparable patterns of limited compensation, career, leadership, and culture effects, supporting contextual interpretation. Table 2 presents systematic literature review synthesis organized by variable domain, documenting percentage of studies finding significant positive relationships and identifying contextual moderators.

Table 2. Systematic Literature Review Synthesis - Variable Relationship Patterns

Variable Domain	Articles Reviewed	Significant Positive Findings	Percentage	Contextual Moderators Identified
Digitalization/Technology	127	113	89%	Implementation quality, user support, training adequacy, system usability
Institutional Policy	89	82	92%	Clarity, consistency, transparency, stakeholder participation
Competence Development	94	88	94%	Professional development access, mentorship

Variable Domain	Articles Reviewed	Significant Positive Findings	Percentage	Contextual Moderators Identified
				availability, research support
Compensation Systems	76	64	84%	Market competitiveness, equity perceptions, performance linkage, flexibility
Career Development	76	66	87%	Advancement transparency, promotion fairness, growth opportunities, merit-based systems
Leadership Practices	81	74	91%	Transformational orientation, supportive supervision, vision communication, empowerment
Organizational Culture	81	71	88%	Innovation orientation, collaboration emphasis, trust levels, psychological safety

3.2 Discussion

The convergent parallel mixed-methods findings comprehensively address research questions regarding how Ministry of Transportation higher education policy implementations influence lecturer job satisfaction and performance within Indonesian maritime institutions. Results demonstrate that digitalization implementation quality, institutional policy clarity, and lecturer competence exert strong significant direct effects on both satisfaction and performance, while organizational culture, leadership style, compensation adequacy, and career development demonstrate limited influence constrained by bureaucratic governance mechanisms characteristic of transportation ministry oversight (Gavalas, Syriopoulos, & Tsatsaronis, 2022; Karakasnaki et al., 2023). These quantitative patterns receive partial validation from systematic literature review documenting universal importance of technology, policy, and competence across diverse higher education contexts, while revealing divergence regarding compensation, career, leadership, and culture whose influence appears contingent upon institutional governance flexibility, autonomy, and resource availability often absent in Indonesian maritime education's Ministry of Transportation contexts.

The strong positive effects of digitalization align with extensive higher education technology literature documenting digital systems' potential for enhancing work efficiency, resource accessibility, communication effectiveness, and administrative streamlining when implemented with adequate user support, training provision, and user-centered design principles. Indonesian maritime institutions' recent digitalization initiatives providing integrated academic information systems, learning management platforms, research databases, and digital communication tools appear to generate genuine satisfaction and performance benefits by reducing administrative burden, improving information access, facilitating collaboration, and enabling innovative pedagogical practices (McVeigh et al., 2016; Nikčević & Škurić, 2021). These benefits materialize despite implementation challenges because fundamental functionality improvements outweigh usability limitations and support inadequacies. However, sustainability concerns emerge as qualitative literature emphasizes ongoing support, continuous training, regular updates, and

responsive refinement as essential for maintaining technology benefits long-term—requirements potentially challenging given maritime institutions' limited technical support capacity and competing resource demands.

Institutional policy clarity's strong effects validate governance scholarship emphasizing transparent, consistent, well-communicated policies as critical for organizational effectiveness, employee satisfaction, and performance optimization. Maritime academy lecturers navigating complex regulatory landscapes encompassing Ministry of Transportation administrative requirements, STCW international compliance obligations, national higher education quality standards, and institutional-specific expectations benefit substantially from clear policy articulation reducing ambiguity, preventing conflicting demands, enabling informed decision-making, and supporting strategic planning. Recent Indonesian maritime education policy reforms attempting to clarify research expectations, standardize evaluation criteria, specify advancement requirements, and align Ministry of Transportation regulations with higher education norms appear to generate satisfaction and performance improvements by reducing uncertainty, enhancing fairness perceptions, and enabling lecturers to strategically allocate effort toward valued activities with confidence regarding recognition and reward.

Lecturer competence's significant effects support human capital theory and professional development literature emphasizing capability enhancement as foundation for performance excellence and career satisfaction (Li et al., 2022; Nikčević & Škurić, 2021). Maritime education's distinctive requirements demanding both academic credentials advanced degrees, research productivity, pedagogical expertise and professional currency including industry experience, practical skills, and regulatory knowledge create continuous competence development imperatives. Lecturers maintaining cutting-edge expertise experience greater teaching effectiveness, research productivity, industry collaboration success, and professional satisfaction compared to colleagues with outdated or incomplete competencies. Institutions supporting competence development through professional development funding, research support services, industry partnership facilitation, advanced training opportunities, and mentorship programs enable lecturer capability enhancement translating into performance improvements and satisfaction gains from accomplishment, recognition, and career advancement prospects (Han et al., 2024; Tai & Qiu, 2024).

The non-significant effects of organizational culture, leadership style, compensation, and career development require careful interpretation acknowledging both methodological considerations and substantive contextual explanations. Methodologically, measurement validity concerns arise whether psychometric instruments developed in Western corporate contexts adequately capture organizational culture and leadership constructs within Indonesian maritime education's distinctive cultural and institutional contexts, potentially attenuating observed relationships. However, more compelling substantive explanations emerge from governance context analysis.

Ministry of Transportation administrative frameworks constrain organizational culture flexibility through standardized procedures, hierarchical reporting structures, and compliance-oriented performance systems limiting institutions' capacity to cultivate innovative, collaborative, risk-tolerant cultures emphasized in higher education best practices. Similarly, leadership style variation remains limited when administrators selected based on seniority, administrative experience, and transportation sector backgrounds receive minimal educational leadership development, resulting in predominantly transactional management rather than transformational leadership driving vision, inspiration, and faculty empowerment.

Compensation and career development constraints reflect civil servant salary structures and bureaucratic promotion procedures characteristic of Ministry of Transportation governance. Lecturer compensation follows national civil servant scales based on educational credentials and tenure rather than performance, market conditions, or institutional discretion, eliminating compensation's potential as satisfaction driver or performance incentive. Career advancement proceeds through bureaucratic mechanisms emphasizing administrative compliance, tenure accumulation, and political navigation alongside academic achievement, creating unclear advancement criteria, delayed recognition, limited meritocracy, and advancement disconnection from teaching excellence or research productivity (Wang & Wright, 2021; Wuwung et al., 2024). These patterns undermine career development's motivational potential. Such structural constraints inherited from transportation sector bureaucracies rather than designed for academic contexts fundamentally limit compensation and career development's influence on satisfaction and performance regardless of implementation quality or individual perceptions.

Job satisfaction's mediating role validates organizational behavior theories emphasizing attitudes' influence on behaviors through motivation, commitment, and discretionary effort mechanisms. Lecturers experiencing satisfaction from effective digital tools, clear policies, and competence development opportunities demonstrate higher performance quality through enhanced engagement, increased effort investment, stronger institutional commitment, and greater willingness to exceed minimum requirements. These patterns explain approximately one-third of institutional factors' total effects on performance through satisfaction pathways. This substantial mediation suggests interventions enhancing satisfaction generate performance benefits beyond direct capability or efficiency improvements, justifying satisfaction cultivation as strategic priority for performance optimization. Reciprocally, performance's smaller mediation of institutional factors' effects on satisfaction supports achievement motivation theories emphasizing accomplishment experiences' contribution to wellbeing and fulfillment. Competence, policy, and digitalization enable performance successes generating satisfaction through achievement feelings, recognition receipt, and professional growth experiences.

The divergence between quantitative findings and systematic literature review patterns regarding compensation, career, leadership, and culture provides critical insights into governance context importance. Global higher education scholarship predominantly examines institutions with autonomous compensation determination, flexible promotion systems, empowered transformational leadership, and collegial cultures contexts enabling these factors' satisfaction and performance influences (Li et al., 2024; Xu et al., 2022). Indonesian maritime institutions' Ministry of Transportation governance creates fundamentally different contexts where bureaucratic rigidity, hierarchical authority, standardized procedures, and limited institutional discretion constrain these factors' variation and influence potential. This contextual specificity demands differentiated policy approaches. While digitalization enhancement, policy clarification, and competence development initiatives promise substantial returns given their demonstrated effects within current constraints, compensation reform, career structure revision, leadership transformation, and culture change require higher-level policy interventions modifying Ministry of Transportation governance frameworks themselves rather than institution-level management improvements.

3.3 Practical Implications and Future Research Directions

Practical implications suggest multi-level intervention priorities. For maritime academy administrators operating within current Ministry of Transportation constraints, findings recommend prioritizing digitalization quality enhancement through improved user support, responsive technical assistance, continuous training, user-centered refinement, and infrastructure investment. Additionally, policy clarity improvement through transparent communication, consistent implementation, stakeholder consultation, regular review, and alignment verification proves essential (Cheng & Zhou, 2024; Pomaska & Acciaro, 2022). Finally, competence development support through professional development funding, research infrastructure, mentorship programs, industry partnership facilitation, and advanced training opportunities represents initiatives promising substantial satisfaction and performance returns within existing governance structures.

For Ministry of Transportation policy officials capable of governance framework modifications, findings suggest regulatory reforms enabling greater institutional autonomy in compensation determination, flexible career advancement procedures recognizing diverse accomplishment pathways, leadership development programs building transformational capabilities, and organizational culture transformation initiatives supporting innovation, collaboration, and calculated risk-taking. These systemic changes potentially activate currently dormant satisfaction and performance drivers.

Future research should investigate several critical questions. Longitudinal studies examining whether current non-significant relationships strengthen over time as institutions develop capacity to leverage compensation, career, leadership, and culture factors within gradually relaxing governance constraints would test temporal dynamics and reform trajectories. Comparative research examining maritime institutions under different governance arrangements education ministry versus transportation ministry oversight, public versus private institutions, Indonesian versus international maritime academies could isolate governance effects from other institutional characteristics.

Intervention studies testing specific policy reforms, management practice innovations, or leadership development programs would establish causal evidence supporting or refining correlational findings. Qualitative investigations exploring lecturer lived experiences with governance constraints, adaptation strategies, resistance patterns, and change aspirations would generate nuanced understanding beyond quantitative variable relationships. These research directions collectively promise to deepen understanding of how vocational maritime higher education can optimize policy implementation for enhanced academic workforce satisfaction and performance within distinctive governance contexts.

4. CONCLUSION

This research demonstrates that digitalization implementation quality, institutional policy clarity, and lecturer competence exert strong significant direct effects on job satisfaction and performance within Indonesian maritime higher education institutions under Ministry of Transportation governance, while organizational culture, leadership style, compensation adequacy, and career development demonstrate limited influence constrained by bureaucratic governance mechanisms. Job satisfaction mediates approximately one-third of institutional factors' effects on performance, with reciprocal smaller mediation by performance on satisfaction, supporting bidirectional relationships between attitudes and behaviors. Systematic literature review reveals these patterns partly reflect universal relationships across higher education

contexts while partly manifest governance-specific constraints limiting certain factors' influence potential within transportation ministry oversight structures. Findings recommend prioritizing digitalization enhancement, policy clarification, and competence development as highest-impact interventions within current constraints, while advocating governance reforms enabling compensation flexibility, career structure revision, leadership transformation, and culture evolution as fundamental changes activating currently dormant performance and satisfaction drivers essential for maritime education workforce sustainability and institutional effectiveness.

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