International Journal of Applied Business & International Management (IJABIM)
Vol. 11 No. 1, pp. 133-151, April, 2026
E-ISSN: 2621-2862 P-ISSN: 2614-7432
https://www.ejournal.aibpmjournals.com/index.php/IJABIM

Developing Maritime Logistics Human Resource Performance Through Maslahah Knowledge-Based Skills

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ARTICLE INFORMATION

Publication information

Research article

HOW TO CITE
Amrullah, R. A., Moejiono, M., Arleiny, A., Imanto, F., Putri, I. A. J., Kurniatama, A., …, & Nurhadi, R. J. (2026). Developing maritime logistics human resource performance through maslahah knowledge-based skills. *International Journal of Applied Business & International Management, 11*(1), 133-151.

DOI:
https://doi.org/10.32535/ijabim.v11i1.4462

Received: 30 September 2025
Accepted: 1 March 2026
Published: 20 April 2026

ABSTRACT

The maritime logistics sector faces increasing pressure from digital transformation, skill shortages, and rising performance demands, highlighting the need for more effective human resource development strategies. This study aims to develop and empirically test Maslahah Knowledge-Based Skills (MKBS) as a mediating mechanism linking training practices to employee performance. A quantitative explanatory design was applied using data from 96 employees across maritime logistics companies in Central Java, analyzed with PLS-SEM. The results show that Training Needs Analysis (TNA) ($\beta = 0.503$, $p < 0.001$), On-the-Job Training (OJT) ($\beta = 0.195$, $p = 0.027$), and Voluntary Training (VT) ($\beta = 0.083$, $p = 0.001$) significantly influence MKBS. Furthermore, MKBS has a strong effect on performance ($\beta = 0.700$, $p < 0.001$) and significantly mediates all training-performance relationships. The findings indicate that training does not directly improve performance unless it is internalized into value-oriented, knowledge-based skills. This study extends Knowledge-Based Theory (KBT) by integrating *maslahah* as a normative dimension in skill formation and provides practical implications for designing sustainable, value-driven HR development in maritime logistics.

Keywords: Knowledge-Based Theory; Maritime Logistics; Maslahah Knowledge-Based Skills; Performance; Training

INTRODUCTION

Digital transformation has significantly reshaped the maritime logistics sector, affecting operational systems, ship design, and logistics management. Digitalization influences not only technical and regulatory aspects but also broader social dimensions and human resources (HR) (Autsadee et al., 2023; Belabyad et al., 2025; Theotokas et al., 2024). As maritime operations become increasingly data-driven and interconnected, organizations are required to develop HR that are not only technically competent but also adaptive, knowledge-intensive, and capable of responding to complex and dynamic operational environments (Evangelista et al., 2023). Furthermore, recent global disruptions, including pandemics and economic uncertainty, have reinforced the strategic role of HR as a key determinant of organizational resilience and sustainable performance in maritime logistics (Pang et al., 2026).

Despite strong regulatory emphasis on training through frameworks such as the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) Convention, the Maritime Labour Convention (MLC) 2006, and International Maritime Organization (IMO) policies, HR development practices remain largely procedural and compliance-oriented. Training is frequently treated as a mandatory requirement rather than a strategic mechanism for enhancing performance and capability development (Alrashedi, 2024; Charli & Pawirosumarto, 2025; Minbaeva, 2020; Nafukho et al., 2023). Consequently, organizations continue to face persistent challenges, including weak employee motivation, low training effectiveness, and misalignment between workforce competencies and operational demands (Elayan et al., 2023). These issues indicate that the mere provision of training is insufficient; rather, the critical challenge lies in how training outcomes are internalized into meaningful skills and work behavior.

From a theoretical perspective, Knowledge-Based Theory (KBT) positions knowledge as a strategic asset for achieving competitive advantage (Zhou et al., 2021). Knowledge management processes, such as acquisition, storage, sharing, and application, are expected to form the foundation of skill development and organizational capability (Akbar et al., 2025). However, existing knowledge-based literature tends to emphasize the instrumental and technical dimensions of knowledge, with limited attention to values, character formation, and moral orientation in the transformation of knowledge into practice (Mariano, 2024). This limitation is particularly relevant in high-risk and value-sensitive sectors such as maritime logistics, where performance is not solely determined by technical competence but also by responsible and ethical behavior.

In this context, the concept of *maslahah* offers a complementary normative framework that emphasizes collective benefit, harm prevention, and orientation toward the common good. Integrating *maslahah* into KBT provides a more holistic perspective on skill formation, where knowledge is not only utilized for efficiency but also guided by ethical responsibility and social value. Such integration has the potential to generate a training approach that produces not only technically capable employees but also individuals characterized by discipline, integrity, and meaningful contribution to organizational and societal outcomes.

Empirical evidence on the relationship between training and performance remains inconclusive. While some studies highlight the importance of training design and resource allocation, others demonstrate that training outcomes are often unsustainable due to rapid organizational change, weak knowledge-sharing mechanisms, and limited managerial commitment to long-term human capital development (Elayan et al., 2023;

Minbaeva, 2020; Nafukho et al., 2023). These inconsistencies suggest that existing models may overlook a critical mechanism that links training inputs to actual performance outcomes.

Previous studies in maritime and logistics contexts predominantly conceptualize training as a technical instrument and examine its direct impact on performance within human capital or resource-based frameworks, treating skills as economically neutral and value-free capabilities (Evangelista et al., 2023; Zhou et al., 2021). Such approaches remain insufficient in explaining why training frequently fails to produce sustainable performance improvements. In particular, they do not adequately capture how knowledge is internalized into stable, value-oriented competencies that shape behavior in complex operational environments.

To address this gap, this study introduces Maslahah Knowledge-Based Skills (MKBS) as a novel conceptual construct that integrates KBT with the principle of *maslahah*. MKBS represents a form of knowledge-based competency that is not only technically effective but also oriented toward responsibility, ethical conduct, and collective benefit. By positioning MKBS as a mediating mechanism, this study argues that training does not directly influence performance; rather, its impact is realized through the formation of value-oriented and behaviorally grounded skills.

Accordingly, this study aims to develop and empirically test a model explaining how Training Needs Analysis (TNA), On-the-Job Training (OJT), and Voluntary Training (VT) influence MKBS and subsequently affect performance in maritime logistics organizations. This study contributes theoretically by extending KBT beyond its conventional technocratic orientation through the integration of a normative dimension, and practically by offering a more sustainable and value-driven approach to human resource development in the maritime logistics sector.

LITERATURE REVIEW

Maslahah and KBT Integration

Maslahah represents a normative framework that emphasizes benefit maximization and harm prevention in human activities. In the context of human resource development, *maslahah* extends the meaning of work beyond instrumental objectives, positioning it as a value-driven activity characterized by responsibility, integrity, and social contribution (Apriadi et al., 2022; Hemberg & Hemberg, 2020; Syahrani et al., 2022). This perspective highlights that human performance should not only be evaluated based on efficiency and output, but also on its broader ethical and societal implications.

Despite its relevance, *maslahah* remains rarely integrated into contemporary management literature, particularly within knowledge-based organizational theories. KBT conceptualizes knowledge as a strategic resource for competitive advantage, yet it largely focuses on the technical processes of knowledge creation and utilization, with limited attention to how values shape the transformation of knowledge into behavior (Mariano, 2024). This creates a theoretical gap, especially in contexts where performance is closely linked to ethical responsibility and risk management.

Accordingly, *maslahah* is positioned in this study as a normative foundation that complements KBT by guiding how knowledge should be applied in practice. This integration leads to the development of MKBS, defined as knowledge-based competencies that combine effectiveness with responsibility and collective benefit.

Through this lens, skills are not treated as value-neutral capabilities but as behaviorally embedded competencies shaped by both knowledge and ethical orientation.

Training as a Mechanism for the Formation of Knowledge-Based Skills

Within the KBT framework, training functions as a mechanism for transforming knowledge into operational skills. However, prior studies indicate that knowledge does not automatically generate value unless it is internalized into practice and behavior (Zaimi et al., 2024). This highlights that the effectiveness of training depends not only on knowledge acquisition but also on the processes through which knowledge is translated into consistent work behavior.

Training effectiveness is influenced by several key mechanisms. TNA ensures that training is aligned with organizational requirements and performance gaps, thereby increasing relevance and applicability (Srivastava & Rao, 2025). OJT enables experiential learning, facilitating the transfer of tacit knowledge through direct work engagement (Al Harrasi et al., 2023; Elayan et al., 2023). Meanwhile, VT reflects intrinsic motivation, which has been shown to enhance knowledge internalization and behavioral application (Mariano, 2024; Nafukho et al., 2023).

These mechanisms operate as complementary processes in skill formation by integrating relevance, experience, and motivation. However, existing training approaches remain predominantly technical, emphasizing capability development without adequately addressing how knowledge is internalized into value-driven behavior. This limitation reinforces the need for a framework that links training processes to the formation of meaningful and ethically grounded competencies.

Accordingly, this study conceptualizes training as a process that contributes to the development of MKBS, where knowledge is transformed into stable, value-oriented skills through aligned training design, experiential learning, and intrinsic motivation.

Hypotheses Development

KBT, MKBS, and Human Resource Performance

KBT posits that knowledge contributes to organizational performance through its transformation into skills and capabilities (Nupus & Nabhan, 2023). Empirical studies consistently show that knowledge acquisition and application enhance employee effectiveness and adaptability (Elayan et al., 2023; Evangelista et al., 2023; Lai et al., 2025; Zhou et al., 2021). However, as highlighted earlier, these models often assume that skills are value-neutral, which limits their explanatory power in contexts where behavior and responsibility are critical.

Extending this perspective, MKBS integrates a normative dimension into knowledge-based competencies. Prior research suggests that performance in complex environments is influenced not only by technical capability but also by behavioral discipline and ethical awareness (Thai et al., 2024). In line with this, MKBS is expected to translate knowledge into responsible and value-oriented work behavior, thereby enhancing performance outcomes.

H1: MKBS has a positive effect on performance.

Figure 1. Derivation of KBT

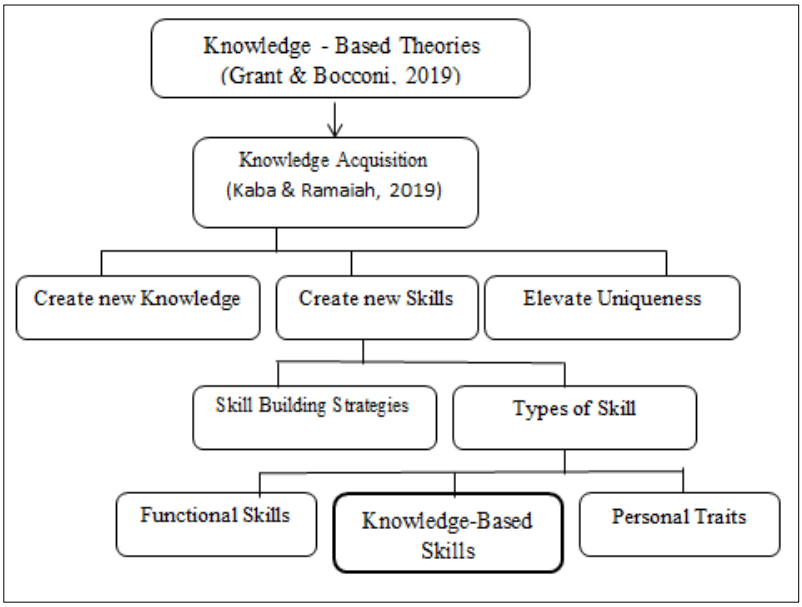

Figure 1 illustrates the transformation of knowledge into operational capabilities within the KBT framework through knowledge acquisition. Knowledge is developed into new knowledge, skills, and organizational uniqueness, which are further shaped through skill-building strategies and typologies. The model highlights that competitive advantage is achieved through the internalization of knowledge into knowledge-based skills that guide effective work behavior.

TNA and MKBS

TNA has been widely recognized as a critical determinant of training effectiveness, as it ensures alignment between training content and organizational requirements (Srivastava & Rao, 2025). Studies have shown that when training is based on accurate identification of performance gaps, knowledge is more likely to be internalized and applied effectively (Merriman et al., 2023; Nafukho et al., 2023).

Building on this evidence, TNA is expected to contribute to the formation of MKBS by ensuring that knowledge acquisition is directly linked to relevant operational challenges. This alignment increases the likelihood that knowledge is transformed into meaningful and value-oriented competencies.

H2: TNA has a positive effect on MKBS.

OJT and MKBS

OJT facilitates experiential learning by enabling individuals to acquire and apply knowledge directly within the work environment. Prior studies indicate that experiential learning plays a crucial role in the development of tacit knowledge and behavioral competence (Al Harrasi et al., 2023; Elayan et al., 2023).

Through continuous interaction with real tasks and feedback, OJT supports the internalization of knowledge into stable work behavior. This process is particularly relevant for the formation of MKBS, as it allows knowledge to be embedded within practical experience and aligned with organizational values.

H3: OJT has a positive effect on MKBS.

VT and MKBS

VT reflects intrinsic motivation, which has been identified as a key driver of knowledge application and continuous learning (Mariano, 2024; Nafukho et al., 2023). Unlike mandatory training, VT encourages self-directed learning and increases the likelihood that knowledge is actively internalized and translated into behavior.

Although its effectiveness depends on organizational support, prior evidence suggests that intrinsically motivated learning contributes to deeper knowledge integration and sustained behavioral change. Therefore, VT is expected to support the formation of MKBS by strengthening the internalization process.

H4: VT has a positive effect on MKBS.

MKBS as a Mediating Mechanism

While traditional models assume a direct relationship between training and performance, empirical findings indicate that training often fails to produce sustainable outcomes when knowledge is not effectively internalized (Elayan et al., 2023; Nafukho et al., 2023). This suggests that an intermediate mechanism is required to explain how training translates into performance.

Within this framework, MKBS is proposed as a mediating construct that links training mechanisms to performance. TNA ensures relevance, OJT facilitates experiential internalization, and VT enhances motivation; collectively, these processes contribute to the formation of MKBS, which in turn drives performance outcomes.

H5: MKBS mediates the effect of TNA on performance.
H6: MKBS mediates the effect of OJT on performance.
H7: MKBS mediates the effect of VT on performance.

MKBS as a Conceptual Model

The integration of KBT, *maslahah*, and training mechanisms leads to the development of MKBS as a comprehensive framework for understanding skill formation. This concept positions skills as knowledge-based competencies that are not only technically effective but also guided by responsibility, ethical conduct, and collective benefit.

MKBS is grounded in the premise that performance in high-risk sectors such as maritime logistics cannot rely solely on technical capability. Instead, it requires the integration of knowledge, experience, and value-oriented behavior to ensure sustainable and responsible outcomes.

Conceptually, MKBS consists of three interrelated dimensions: (1) insight and experience, reflecting knowledge mastery and continuous learning; (2) foundational Islamic beliefs (*aqidah*), representing value awareness and purpose-driven orientation; and (3) ethical conduct and character (*akhlaq*), emphasizing discipline, cooperation, and ethical behavior. These dimensions are developed through training mechanisms that ensure relevance, facilitate experiential learning, and strengthen intrinsic motivation.

Accordingly, MKBS is positioned as the central mechanism that transforms training inputs into effective and responsible performance outcomes, providing the conceptual basis for the empirical model tested in this study.

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Conceptual Framework

Figure 2. Empirical Research Model

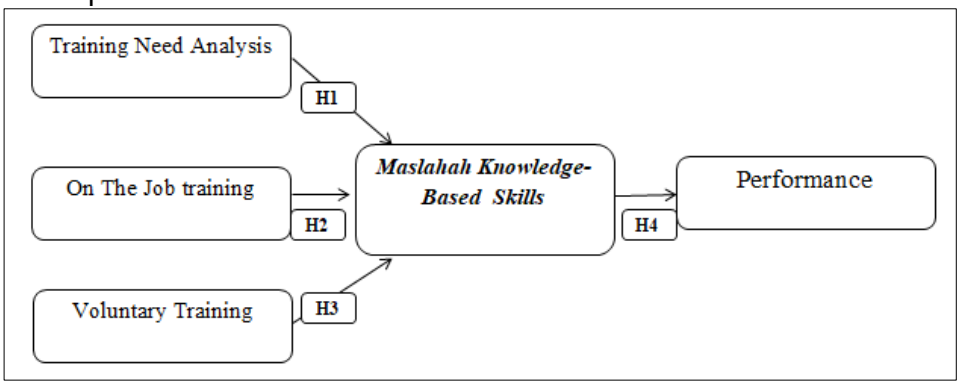

Figure 2 presents the empirical model in which TNA, OJT, and VT act as exogenous variables influencing MKBS, while MKBS directly affects performance. Additionally, MKBS functions as a mediating construct in the relationship between training mechanisms and performance (H1–H7).

RESEARCH METHOD

Research Design

This study employs an explanatory research design aimed at explaining the causal relationships among variables within the proposed conceptual model. This approach is selected because the study not only describes the observed phenomena but also empirically examines the effects of training mechanisms on MKBS and their subsequent impact on individual performance within maritime logistics organizations.

The research model tests three exogenous variables (TNA, OJT, and VT), one mediating variable, MKBS, and one endogenous variable, performance.

Figure 3. Research Method Flow

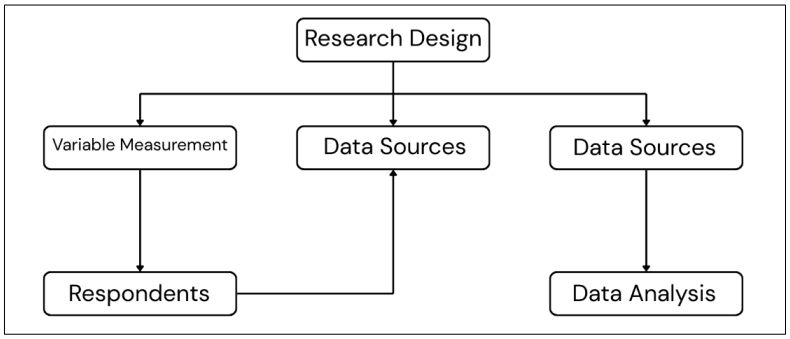

Figure 3 illustrates the overall research flow adopted in this study. The model begins with the determination of the research design, which provides the structural foundation for the entire study. From this point, the process branches into three interrelated components: variable measurement, data sources, and data analysis. Variable measurement defines how each construct is operationalized and guides the identification of appropriate respondents. Data sources represent the origin of empirical evidence used in the study, linking respondents to the research model. Finally, data analysis transforms the collected data into meaningful findings through systematic analytical procedures. This flow emphasizes that the validity of the results depends on the coherence between research design, measurement, data collection, and analytical techniques.

Variables and Measurement

This study incorporates five latent variables measured using reflective indicators adapted from prior studies and contextualized to the maritime logistics sector. All indicators were assessed using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

TNA was measured by indicators capturing the ability to identify performance gaps, determine relevant training needs, and formulate appropriate training criteria. OJT was assessed through adherence to work instructions, willingness to participate in job rotation, and commitment to completing internships or practical training programs. VT was measured using indicators reflecting opportunities to gain additional experience, willingness to engage in self-directed learning, and openness to cross-generational and cross-cultural learning.

MKBS were operationalized through indicators representing the ability to collaborate across differences, strong work ethics grounded in *akhlaq*-based values, and insights and experiences oriented toward social skills and collective benefit. Finally, performance was measured through indicators capturing effectiveness in achieving outcomes, efficiency in resource utilization, and the economic aspects of task execution.

Data Sources and Collection Methods

Primary data were obtained through the distribution of structured questionnaires to employees of maritime logistics companies operating in Central Java Province, particularly in the vicinity of Tanjung Emas Port, Semarang. The questionnaire was developed based on the research variable indicators and distributed directly to respondents. To strengthen the validity of the findings, limited interviews were also conducted with key respondents to gain deeper insights into training practices and performance in the field.

Secondary data were collected from reports issued by relevant institutions, organizational documents, and scientific literature related to human resource development, training, and maritime logistics.

Population and Sample

The study population consisted of 96 employees from six maritime logistics companies operating in the Tanjung Emas Port area of Semarang. Given the relatively small population size, this study employed a saturated sampling (census) technique, in which all population members were included as respondents. This approach was selected to achieve a high level of data accuracy and to minimize generalization errors.

Data Analysis Technique

Data analysis was carried out using Partial Least Squares–Structural Equation Modeling (PLS-SEM) with the assistance of SmartPLS software. This technique was selected because of its suitability for predictive and complex research models and its ability to handle relatively small sample sizes. The analysis followed a two-stage procedure comprising measurement model and structural model evaluations.

The measurement model (outer model) evaluation focused on assessing the validity and reliability of the research instruments. Convergent validity was examined through outer loading values exceeding 0.70 and Average Variance Extracted (AVE) values above 0.50. Discriminant validity was assessed using the Fornell–Larcker criterion and cross-loading analysis to ensure adequate distinction among constructs. Construct reliability

was evaluated using composite reliability coefficients, with values greater than 0.70 indicating acceptable internal consistency.

The structural model (inner model) evaluation was conducted to examine the relationships among the latent variables. The coefficient of determination (R^2) was used to assess the explanatory power of the model for endogenous constructs. Hypothesis testing was performed using path coefficients and corresponding p-values generated through a bootstrapping procedure at a 5% significance level ($\alpha = 0.05$). In addition, effect size (f^2) values were calculated to determine the relative strength of each predictor, with thresholds of 0.02, 0.15, and 0.35 representing small, medium, and large effects, respectively. Overall, this analytical approach enables a comprehensive assessment of the conceptual model, particularly in evaluating the mediating role of MKBS in linking training mechanisms to individual performance within maritime logistics organizations.

RESULTS

Respondent Characteristics

Table 1. Respondent Characteristics

Characteristics	Category	Frequency (n)	Percentage (%)
Gender	Male	71	73.95
	Female	25	26.04
Age	21–30	27	28.12
	31–40	21	21.88
	41–50	31	32.3
	51–60	17	17.7
Education	Junior High School	5	5.21
	High School	22	22.91
	D3	41	42.71
	S1	28	29.17
Work Exp (Years)	1–10	37	38.54
	11–20	24	25
	21–30	27	28.13
	31–40	8	8.33
Employment Status	Training	9	9.37
	Contract	24	25
	Permanent	63	65.63

Table 1 shows that this study included 96 people from six maritime logistics companies that work in the Tanjung Emas Port area of Semarang. Most of the people who work in maritime logistics are men (73.95%), while only 26.04% are women. This composition reflects the characteristics of the maritime sector, which is still very masculine, especially in operational fields that require physical endurance and high mobility.

Most of the people who answered were between the ages of 41 and 50 (32.30%), followed by those between the ages of 21 and 30 (28.12%), 31 and 40 (21.88%), and 51 and 60 (17.70%). This productive middle-aged group is the most important for maritime logistics activities, which shows that these activities rely heavily on workers who are emotionally stable and have a lot of experience. This condition pertains to the industry's characteristics, which necessitate exact decision-making, discipline, and significant accountability for operational risks.

Most of the people who answered had a diploma (D3) (42.71%), followed by a bachelor's degree (S1) (29.17%), a high school diploma (22.91%), and a junior high school diploma

(5.21%). This piece shows that the maritime logistics industry is supported by skilled workers who have practical technical skills. The fact that D3 graduates are in charge of daily operations supports the idea that developing skills based on knowledge is a very strategic way to improve performance.

Respondents with 1–10 years of experience made up 38.54% of the total, followed by 21–30 years at 28.13%, 11–20 years at 25.00%, and 31–40 years at 8.33%. This information shows that maritime logistics companies hire both new and experienced workers. This mix makes for strong organizational learning dynamics, where sharing knowledge and skills is very important.

Most of the people who answered (65.63%) were permanent employees. Next were contract employees (25.00%) and training participants (9.37%). This structure shows that most of the people who answered have long-term commitments to the organization. This means that teaching people skills that are useful for *maslahah* could have a lasting effect on the company's performance.

The overall profile of the respondents shows that the maritime logistics sector is made up mostly of men, is made up of older workers with vocational education, and has a lot of work experience. This situation makes the study even more important because it tests how TNA, OJT, and VT affect MKBS in a workforce that really is the backbone of maritime logistics operations.

Descriptive Statistics of Research Variables

Table 2. Descriptive Statistics Indicator

	Variable	Mean	Std. Dev.	Category
1	TNA	4.11	0.50	High
2	OJT	4.07	0.47	High
3	VT	4.40	0.53	High
4	MKBS	4.14	0.52	High
5	PERF	4.13	0.45	High

Note: MKBS (Maslahah Knowledge-Based Skills), OJT (On-the-Job Training), PERF (Performance), TNA (Training Need Analysis), VT (Voluntary Training)

A five-point Likert scale was applied to measure all of the indicators. Mean values were put into three groups for interpretation: low (1.00–2.33), medium (2.34–3.07), and high (≥ 3.08). Table 2 shows that all of the variables are in the high range, with mean values between 4.07 and 4.40 and standard deviations between 0.45 and 0.53. This means that the participants all gave consistent and positive answers.

VT has the highest mean (M = 4.40; SD = 0.53), followed by MKBS (M = 4.14; SD = 0.52), performance (M = 4.13; SD = 0.45), TNA (M = 4.11; SD = 0.50), and OJT (M = 4.07; SD = 0.47). These results show that people who answered the survey think that training practices, knowledge-based skills, and performance are good in the maritime logistics setting.

At the construct level, TNA gets consistently high scores on problem identification, needs assessment, and training criteria. This shows that it is very good at matching training to operational needs. OJT also shows high values, which shows that learning through job instructions, rotation, and internships is effective. VT, which has the highest average, shows that there is an open learning culture that encourages people of all ages and backgrounds to share what they know.

MKBS has a high mean, which means that people who answered the survey see skills as more than just technical abilities. They also see them as value-driven skills that include character, insight, and experience. In the same way, performance scores are high in the areas of effectiveness, efficiency, and economy, which means that employees are generally doing a good job.

Overall, these results show that the maritime logistics workplace has strong training practices, well-developed knowledge-based skills, and good performance outcomes. This gives us a solid base for further structural analysis.

Evaluation of Measurement Model

The measurement model was evaluated to ensure construct validity and reliability. The convergent validity test showed that all indicators had an outer loading value ≥ 0.648 with a t-statistic value > 1.96 and a p-value < 0.05. This indicates that each indicator is able to adequately represent the latent construct. Although several indicators exhibit outer loading values slightly below the recommended threshold of 0.70 (minimum = 0.648), they were retained based on both statistical and theoretical considerations. According to Hair et al. (2022), outer loadings between 0.60 and 0.70 are acceptable in exploratory or newly developed models, particularly when construct reliability and convergent validity are established. In this study, all constructs meet the required Composite Reliability (> 0.70) and AVE (> 0.50), confirming adequate convergent validity. Furthermore, removing these indicators would reduce the conceptual representation of the constructs, especially in capturing the multidimensional nature of MKBS. Therefore, the retained indicators are considered valid and appropriate for further analysis. Convergent validity and construct reliability are shown in Table 3.

Table 3. Construct Validity and Reliability

	Construct	Cronbach's Alpha	Composite Reliability	AVE
1	MKBS	0.717	0.841	0.638
2	OJT	0.715	0.749	0.508
3	PERF	0.765	0.814	0.601
4	TNA	0.843	0.738	0.507
5	VT	0.806	0.740	0.624

Note: MKBS (Maslahah Knowledge-Based Skills), OJT (On-the-Job Training), PERF (Performance), TNA (Training Need Analysis), VT (Voluntary Training)

Table 3 shows that all constructs satisfy the required criteria for measurement quality. Composite Reliability values exceed 0.70, indicating adequate internal consistency, while AVE values are above 0.50, confirming convergent validity. In addition, the Fornell–Larcker test demonstrates acceptable discriminant validity, as the square root of the AVE for each construct is greater than its correlations with all other constructs.

Table 4. Fornell–Larcker Criterion

	Construct	MKBS	OJT	PERF	TNA	VT
1	MKBS	0.704				
2	OJT	0.377	0.714			
3	PERF	0.382	0.360	0.732		
4	TNA	0.354	0.367	0.381	0.731	
5	VT	0.529	0.392	0.455	0.475	0.695

Note: MKBS (Maslahah Knowledge-Based Skills), OJT (On-the-Job Training), PERF (Performance), TNA (Training Need Analysis), VT (Voluntary Training)

The results in Table 4 confirm that each construct has different characteristics and does not overlap with the others. The Standardized Root Mean Square Residual (SRMR) value of 0.068 (< 0.08) indicates that the model has good goodness of fit. All Variance Inflation Factor (VIF) values are below 5.0, so there is no multicollinearity problem. Thus, the measurement model is declared valid and reliable for structural testing.

Structural Model Evaluation and Hypothesis Testing

Figure 4. PLS MKBS Structural Model

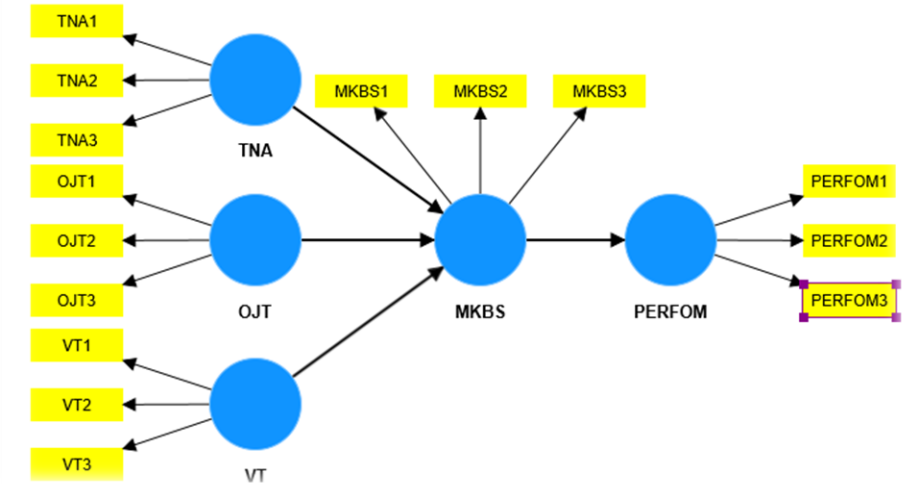

Figure 4 depicts the PLS-SEM structural model used to test the proposed relationships among the study variables. TNA, OJT, and VT are modeled as exogenous constructs, each measured by three reflective indicators. These three training mechanisms are specified to directly influence MKBS, which is represented by three indicators capturing its core dimensions. MKBS is then modeled as the sole predictor of Performance, which is measured through three performance indicators. This structure operationalizes the central assumption of the study that training does not affect performance directly, but operates through the formation of MKBS. The model, therefore, allows empirical testing of both the direct effects of TNA, OJT, and VT on MKBS and the mediating role of MKBS in translating training outcomes into individual performance.

Structural model evaluation was conducted to test the causal relationships between variables. The path coefficient test results are presented in Table 5.

Table 5. Structural Path Coefficients

	Relation	Coefficient	T-Statistic	P-Value
1	MKBS → Performance	0.700	11.437	0.000
2	OJT → MKBS	0.195	2.207	0.027
3	TNA → MKBS	0.503	5.289	0.000
4	VT → MKBS	0.083	3.182	0.001

Note: MKBS (Maslahah Knowledge-Based Skills), OJT (On-the-Job Training), PERF (Performance), TNA (Training Need Analysis), VT (Voluntary Training)

Table 5 indicates that all structural paths are statistically significant at the 5% level (α = 0.05). There is a strong link between MKBS and performance, with a positive coefficient (β = 0.700; t = 11.437; p = 0.000), which means that MKBS has a big effect on performance. This result backs up H1.

TNA has the biggest effect on MKBS (β = 0.503; t = 5.289; p = 0.000), which means that figuring out what training is needed is very important for shaping MKBS. So, this study confirms H2. OJT also has a big positive effect on MKBS (β = 0.195; t = 2.207; p = 0.027), which backs up H3 and shows that real-world training helps it grow.

VT is still statistically significant (β = 0.083; t = 3.182; p = 0.001), which means that it still has a big effect on MKBS. So, H4 is accepted.

The model also does a good job of explaining things. The R^2 value for MKBS is 0.455, which means that TNA, OJT, and VT explain 45.5% of the differences in MKBS. At the same time, MKBS accounts for 49.0% of the difference in performance (R^2 = 0.490). These values are in the moderate-to-strong range, which means that the model gives a pretty good explanation of how the variables are related.

Table 6. Indirect Effects

	Mediation Pathway	T-Statistic	P-Value
1	VT → MKBS → Performance	2.324	0.020
2	OJT → MKBS → Performance	2.268	0.023
3	TNA → MKBS → Performance	4.498	0.000

Note: MKBS (Maslahah Knowledge-Based Skills), OJT (On-the-Job Training), PERF (Performance), TNA (Training Need Analysis), VT (Voluntary Training)

The mediation test results in Table 6 show that all of the indirect effects through MKBS are statistically significant. The analysis shows that MKBS has a strong effect on the link between VT and performance (t = 2.324; p = 0.020), which supports H5. For OJT, MKBS also has a big impact on performance (t = 2.268; p = 0.023), which supports H6.

The link between TNA and performance has the strongest mediating effect, with MKBS acting as a strong mediator (t = 4.498; p = 0.000). This finding robustly supports H7 and indicates that MKBS effectively transmits the impact of TNA into enhanced performance outcomes.

In general, these results show that training alone does not directly lead to better performance; instead, MKBS plays a role in making this happen. In this case, MKBS is the main tool that turns training inputs into measurable performance outcomes.

DISCUSSION

Key Findings Analysis

The Effect of MKBS on Performance (H1 Accepted)

The findings confirm that MKBS has a strong positive effect on performance (β = 0.700; p < 0.001), indicating that performance in maritime logistics is not solely driven by technical competence, but by the integration of knowledge, experience, and value-oriented behavior. This suggests that knowledge contributes to performance only when it is internalized into stable competencies that guide behavior in operational contexts.

This result challenges conventional assumptions that training directly improves performance. Instead, it demonstrates that performance emerges through a transformation process in which knowledge is translated into meaningful and behaviorally embedded skills. In this regard, the findings extend KBT by showing that the effectiveness of knowledge depends not only on its application but also on its alignment with responsibility and ethical orientation (Evangelista et al., 2023; Zhou et al., 2021). This is consistent with maritime organizational studies emphasizing that

effectiveness is shaped through knowledge internalization and learning processes rather than purely technical interventions (Safitri & Pradana, 2022).

The Effect of TNA on MKBS (H2 Accepted)
The significant effect of TNA on MKBS (β = 0.503; p < 0.001) highlights the importance of aligning training with actual performance needs. This finding indicates that relevance is a critical condition for transforming knowledge into value-oriented competencies. When training is grounded in accurate identification of performance gaps, it becomes more effective in facilitating knowledge internalization.

This result supports prior studies that position TNA as a key determinant of training effectiveness and learning outcomes (Merriman et al., 2023; Nafukho et al., 2023). In high-risk sectors such as maritime logistics, where operational errors can have significant consequences, precise needs mapping becomes essential for ensuring that knowledge is translated into responsible and contextually appropriate behavior (Latief, 2019; Maramis et al., 2019).

The Effect of OJT on MKBS (H3 Accepted)
The positive influence of OJT on MKBS (β = 0.195; p = 0.027) confirms the role of experiential learning in embedding knowledge into practice. OJT allows individuals to engage directly with real work situations, facilitating the development of tacit knowledge and reinforcing consistent work behavior.

This finding aligns with prior research highlighting that experiential learning is a critical mechanism for transforming knowledge into practical competence (Al Harrasi et al., 2023; Elayan et al., 2023; Pratiwi et al., 2025). Through direct interaction with operational tasks, OJT strengthens not only technical skills but also situational awareness and responsibility, which are essential components of MKBS.

The Effect of VT on MKBS (H4 Accepted)
The results indicate that VT has a significant positive effect on MKBS (β = 0.083; p = 0.001), although its influence is relatively smaller compared to TNA and OJT. This suggests that intrinsic motivation plays a supporting role in the formation of knowledge-based skills by encouraging continuous and self-directed learning.

This finding is consistent with studies showing that voluntary learning enhances the internalization of knowledge and promotes behavioral application (Mariano, 2024; Nafukho et al., 2023). While VT alone may not be sufficient to drive competency formation, it reinforces the learning process by enabling individuals to actively engage with knowledge beyond formal training structures.

The Mediating Role of MKBS (H5–H7 Accepted)
The mediation analysis demonstrates that MKBS significantly mediates the relationships between TNA, OJT, VT, and performance. This finding confirms that training does not directly improve performance; rather, its impact is realized through the formation of value-oriented competencies.

These results provide a clearer explanation for the inconsistent findings reported in prior studies on training effectiveness (Elayan et al., 2023; Nafukho et al., 2023). By positioning MKBS as a mediating mechanism, this study shows that training outcomes depend on the extent to which knowledge is internalized into behavior. TNA ensures relevance, OJT facilitates experiential learning, and VT enhances motivation; however,

only when these processes collectively contribute to MKBS do they translate into improved performance.

Theoretical Contribution
This study extends KBT by integrating a normative dimension through *maslahah*, demonstrating that knowledge-based competencies are not inherently performance-enhancing unless they are embedded with values that guide responsible and ethical behavior. In this context, MKBS offers a more comprehensive conceptualization of skills as the integration of knowledge, experience, and value orientation.

Managerial Implications
From a practical perspective, the findings suggest that organizations should reposition training as a process of competency internalization rather than a routine activity. TNA should be conducted systematically to ensure alignment with operational challenges. OJT should be structured through mentoring, job rotation, and continuous feedback to facilitate experiential learning. VT should be supported by a conducive learning environment that encourages self-directed development.

Furthermore, performance evaluation systems should incorporate MKBS-related indicators, such as work ethic, insight, and experiential competence, to ensure that training outcomes are effectively translated into sustainable performance improvements.

Summary Insight
Overall, this study demonstrates that training effectiveness is not determined by the presence of training alone, but by the extent to which knowledge is internalized into value-oriented competencies. MKBS functions as the central mechanism that transforms training inputs into sustainable performance outcomes in maritime logistics organizations.

CONCLUSION

This study aims to develop and empirically examine the role of MKBS as a mediating mechanism linking TNA, OJT, and VT to performance in maritime logistics organizations. The findings confirm that all training mechanisms significantly contribute to the formation of MKBS. MKBS, in turn, has a strong positive effect on performance. Furthermore, MKBS is empirically proven to mediate the relationship between training and performance, indicating that the impact of training is not direct but operates through the internalization of knowledge into value-oriented competencies.

These results demonstrate that training effectiveness depends not merely on the provision of training activities, but on the extent to which knowledge is transformed into stable, behaviorally embedded skills. In this context, MKBS emerges as a critical mechanism that integrates knowledge, experience, and value orientation, enabling training inputs to be translated into sustainable performance outcomes in maritime logistics organizations.

From a theoretical perspective, this study extends KBT by incorporating a normative dimension through *maslahah*, highlighting that knowledge-based competencies are not inherently performance-enhancing unless they are guided by responsibility, ethical awareness, and collective benefit. This perspective enriches the understanding of skill formation by positioning performance as the outcome of the integration between technical capability and value-driven behavior, particularly in high-risk and value-sensitive sectors.

From a managerial perspective, the findings suggest that organizations should reposition training as a process of MKBS formation rather than a routine or compliance-based activity. This involves ensuring that TNA is aligned with actual operational challenges, designing OJT through structured mentoring and feedback mechanisms, fostering a learning culture that supports VT, and integrating MKBS-related indicators, such as work ethic, insight, and experiential competence, into performance evaluation systems. Through this approach, organizations can enhance the effectiveness of training and achieve more sustainable performance improvements.

LIMITATION

This study is subject to several limitations. First, it is conducted within a specific regional context, which may limit the generalizability of the findings to other sectors or geographical settings. Second, the use of a cross-sectional design restricts the ability to capture dynamic changes in skill formation and performance over time. Future research is therefore encouraged to adopt longitudinal approaches, expand the scope across different industries, and further explore the development of MKBS in diverse organizational contexts. In addition, future studies may deepen the examination of the normative dimension by integrating MKBS with sector-specific frameworks, such as halal logistics, to enhance its theoretical and practical applicability.

ACKNOWLEDGMENT

The authors would like to express sincere appreciation to all parties who contributed to the completion of this study. Special thanks are extended to the academic supervisors and colleagues for their valuable guidance, constructive feedback, and scholarly support throughout the research process. The authors also acknowledge the cooperation of all respondents and institutional partners in the maritime logistics sector who provided access, data, and insights essential for this research. Their contributions made this study possible and significantly enhanced the quality of its outcomes.

DECLARATION OF CONFLICTING INTERESTS

The authors declare that there is no conflict of interest regarding the publication of this paper. The research was conducted independently without any financial or commercial relationships that could be construed as a potential conflict of interest.

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