

Digital oriented human resource management in strengthening maritime industry competitiveness

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ABSTRACT

Given the strategic contribution of the maritime sector to national economic development, effective human resource management becomes essential in sustaining institutional performance. This study empirically examines the effect of competency-based human resource management practices on organizational performance in the maritime context. Specifically, the research analyzes how employee competencies, training programs, and performance-based evaluation systems contribute to workforce productivity and organizational effectiveness. This study employs a quantitative research approach using survey data collected from employees working in maritime-related organizations, including shipping services, port operations, and maritime education institutions. Data were analyzed using multiple regression analysis to test the proposed relationships between competency-based human resource management practices and organizational performance indicators. The findings indicate that competency development, structured training, and transparent performance appraisal systems have a positive and significant effect on employee performance, which in turn enhances overall organizational performance in the maritime sector. These results highlight the importance of aligning human resource strategies with industry-specific competency standards to strengthen competitiveness and sustainability. This study contributes to the human resource management literature by providing empirical evidence from the maritime context, which remains underexplored in prior studies. Practically, the findings offer insights for maritime industry managers and policymakers to design effective human resource strategies that support workforce development and long-term organizational performance.

1. Introduction

The maritime sector plays a vital role in supporting Indonesia's economic development as an archipelagic country with extensive marine resources and strategic sea lanes. The effectiveness of maritime industries and maritime education institutions is closely linked to the quality of human resources that manage and operate them. In this context, human resource management (HRM) becomes a key determinant in ensuring organizational performance and sustainability.

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Competent human resources are required not only to meet technical and operational standards, but also to respond to dynamic challenges such as technological advancement, safety regulations, and global competition in the maritime sector.

Maritime education institutions, particularly vocational-based institutions, are expected to produce skilled graduates who are ready to meet industry demands. Politeknik Maritim Negeri Indonesia has a strategic responsibility to develop human resources that align with national maritime competency standards and international conventions. However, disparities in employee competencies, limited training effectiveness, and conventional performance appraisal systems remain challenges that may hinder organizational performance. These issues indicate the need for a more structured and competency-based approach to human resource management within maritime education institutions.

A substantial body of human resource management literature indicates that investments in competency development, continuous training programs, and structured performance management systems significantly contribute to strengthening organizational performance. Nevertheless, most existing research focuses on manufacturing, service, or corporate sectors, while empirical evidence from the maritime education context remains limited. Moreover, studies that specifically examine competency-based HRM within state maritime polytechnics are still scarce. This gap suggests the necessity for further investigation to understand how competency-based HRM practices influence organizational performance in maritime education institutions.

This study examines how competency-based human resource management influences institutional performance at Politeknik Maritim Negeri Indonesia. The investigation centers on competency development, training effectiveness, and performance appraisal systems as key determinants of employee and organizational outcomes. By offering empirical evidence from a maritime education institution, this research broadens the application of strategic human resource management within a vocational maritime context. The findings are expected to inform policy formulation and managerial decision-making aimed at enhancing institutional sustainability and competitive capacity.

2. Theoretical Framework and Hypotheses Development

2.1. Theoretical Framework

Competency-based human resource management is built upon the premise that organizational success depends on the extent to which employee capabilities correspond with work demands. Within this perspective, competencies encompass an integrated set of knowledge, technical skills, personal attributes, and professional attitudes that support effective job performance.

In maritime organizations and maritime education institutions, competency requirements extend beyond operational expertise. They also incorporate managerial capabilities, behavioral standards, and safety compliance aligned with both national regulations and internationally recognized maritime conventions.

Human Capital Theory posits that organizational investment in human resources, particularly through education, training, and competency development, leads to higher employee productivity and improved organizational performance. By systematically enhancing employee competencies, organizations are better equipped to adapt to environmental changes, maintain service quality, and achieve sustainable performance. In the context of maritime education institutions, such as Politeknik Maritim Negeri Indonesia, competency-based human resource management is especially critical due to the sector's reliance on technical expertise, regulatory compliance, and industry standards. The implementation of competency-based HRM ensures that academic and administrative staff possess the necessary competencies to effectively support learning processes, institutional governance, and alignment with maritime industry needs.

Competency-based HRM emphasizes several key practices, including competency mapping, structured training programs, and performance appraisal systems aligned with competency standards. Competency mapping allows organizations to identify gaps between existing employee competencies and required competency levels. Training programs are then designed to address these gaps, ensuring continuous improvement of employee capabilities. Furthermore, performance appraisal systems based on competencies provide objective and transparent evaluations, which encourage employees to improve their performance and align individual goals with organizational objectives.

From a strategic standpoint, human resource management is positioned as a central mechanism in translating organizational objectives into

measurable performance outcomes. The Strategic Human Resource Management (SHRM) perspective emphasizes that the effectiveness of HR practices depends on their consistency with institutional direction and long-term strategic priorities. When HR policies are coherently integrated with organizational goals, institutions are more likely to achieve sustainable performance improvements.

Within maritime education institutions, the implementation of competency-oriented HR practices plays a critical role in supporting institutional mandates, particularly in preparing professionally qualified maritime graduates and strengthening operational effectiveness. Accordingly, this study adopts an integrative theoretical lens combining Human Capital Theory and the SHRM framework. Human Capital Theory underscores the value of investing in employee capabilities, while SHRM explains how structured HR systems channel these capabilities toward enhanced organizational outcomes.

Building upon this theoretical integration, the present study systematically evaluates the linkage between competency-based HRM and organizational performance in the maritime education setting, thereby providing empirical validation within a context that has received limited scholarly attention.

2.2. Hypotheses Development

Competency-based human resource management emphasizes the alignment between individual competencies and organizational objectives to improve performance outcomes. Within maritime education institutions, the systematic management of employee competencies represents a critical foundation for achieving institutional effectiveness. Ensuring that academic and administrative personnel demonstrate adequate technical expertise, managerial capability, and professional conduct is fundamental to sustaining organizational performance.

Drawing upon Human Capital Theory and the Strategic Human Resource Management perspective, organizational investment in competency enhancement is viewed as a strategic asset that yields performance benefits at both the individual and institutional levels.

Competency Development and Organizational Performance

Competency development refers to systematic efforts undertaken by organizations to enhance employees' knowledge, skills, and abilities in

accordance with job requirements. In maritime education institutions, competency development is crucial due to the dynamic nature of maritime regulations, safety standards, and technological advancements. Employees with higher competency levels are more capable of performing their duties efficiently, making accurate decisions, and contributing to institutional goals. Previous studies suggest that well-developed employee competencies positively influence organizational performance by improving productivity and service quality. Therefore, competency development is expected to have a direct positive effect on organizational performance.

H1: Competency development has a positive effect on organizational performance.

Training and Organizational Performance

Training is a key mechanism for translating competency requirements into actual employee capabilities. Through structured and relevant training programs, organizations can reduce competency gaps and enhance employee effectiveness. In the maritime education sector, training programs related to teaching methods, administrative systems, safety management, and maritime standards are essential to support institutional performance. Effective training improves employees' ability to perform tasks, adapt to change, and achieve performance targets. Accordingly, training is expected to positively influence organizational performance.

H2: Training has a positive effect on organizational performance.

Performance Appraisal and Organizational Performance

Performance appraisal systems provide feedback on employee performance and serve as a basis for decision-making related to rewards, development, and career progression. When performance appraisal is based on clear and objective competency standards, employees are more motivated to improve their performance and align their efforts with organizational objectives. In maritime education institutions, competency-based performance appraisal promotes accountability, transparency, and continuous improvement. As a result, an effective performance appraisal system is expected to enhance organizational performance.

H3: Performance appraisal has a positive effect on organizational performance.

Conceptual Framework

Based on the theoretical framework and hypothesis development, this study proposes a conceptual framework that explains the relationship between competency-based human resource management and organizational performance. Competency-based HRM is represented by three main dimensions: competency development, training, and performance appraisal. These dimensions are treated as independent variables that influence organizational performance as the dependent variable.

Figure 1 presents the conceptual framework of this study, which examines the effects of competency development, training programs, and performance appraisals on organizational performance, with competency-based human resource management (HRM) acting as a moderating variable.

Competency development reflects the organization's efforts to enhance employees' knowledge, skills, and abilities required to perform their roles effectively. Well-structured competency development initiatives are expected to improve individual capabilities, which ultimately contribute to higher organizational performance.

Training programs represent systematic organizational activities designed to improve employees' technical and behavioral competencies. Effective training programs enable employees to perform tasks more efficiently and adapt to changing work demands, thereby positively influencing organizational performance.

Performance appraisals refer to formal evaluation systems used to assess employee performance and provide feedback for improvement. Transparent and objective appraisal systems are expected to motivate employees, align individual performance with organizational goals, and enhance overall organizational performance.

Furthermore, competency-based HRM is incorporated as a moderating variable in this framework. Competency-based HRM emphasizes the alignment of HR practices with clearly defined competency standards. Such alignment is expected to strengthen the positive effects of competency development, training programs, and performance

appraisals on organizational performance by ensuring consistency in recruitment, development, evaluation, and reward systems.

Overall, this conceptual framework suggests that organizational performance is directly influenced by competency development, training programs, and performance appraisals, while the strength of these relationships depends on the extent to which competency-based HRM is effectively implemented.

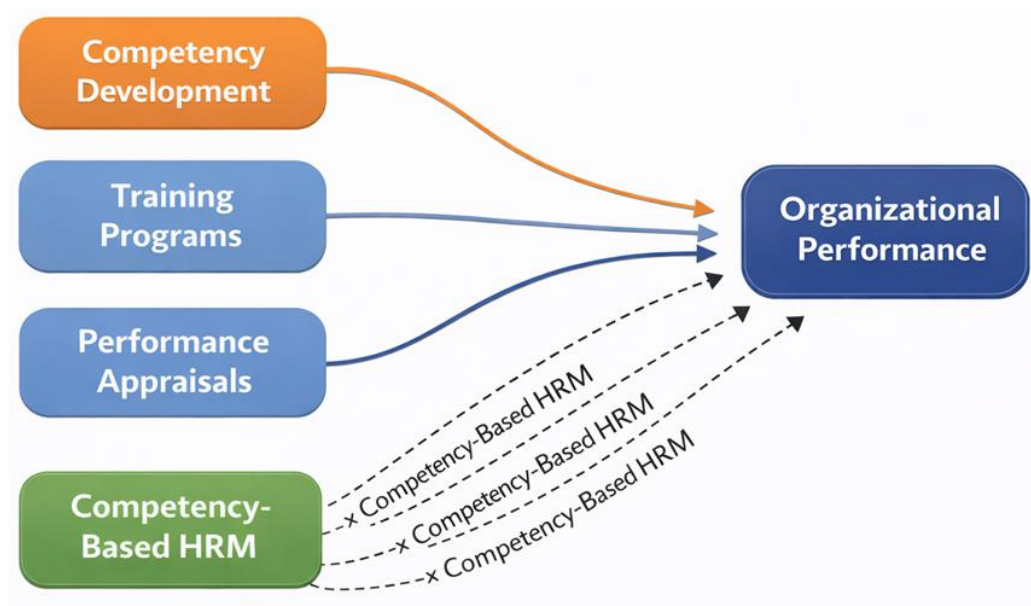


Figure 1. Conceptual Framework

This framework reflects the assumption that effective implementation of competency-based HRM practices enhances employee capabilities, which ultimately leads to improved organizational performance in maritime education institutions

3. Research Method

3.1. Data Sample Collection

This study employs a quantitative research design to examine the effect of competency-based human resource management on organizational performance in a maritime education institution. The research object is Politeknik Maritim Negeri Indonesia, which represents a state vocational institution operating in the maritime sector. The unit of analysis consists

of human resources involved in academic and administrative activities, including lecturers and educational support staff.

The population of this study includes all lecturers and educational staff employed at Politeknik Maritim Negeri Indonesia. A purposive sampling technique was applied to select respondents who met specific criteria, namely permanent employment status and a minimum of one year of work experience. These criteria were chosen to ensure that respondents had sufficient understanding of institutional human resource management practices and performance evaluation systems.

Primary data were collected using a structured questionnaire distributed directly and electronically to respondents. The questionnaire was designed using a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) to measure respondents' perceptions of competency development, training, performance appraisal, and organizational performance. To improve the accuracy and reliability of responses, the questionnaire items were adapted from relevant previous studies and adjusted to the context of maritime education institutions.

The data collection process was conducted over a specified period to ensure an adequate response rate. All completed questionnaires were screened to ensure data completeness and consistency before further analysis. The final dataset was then prepared for statistical analysis to test the proposed hypotheses and examine the relationships among the research variables.

3.2. Technical Analysis and Variable Measurement

Hypothesis testing was undertaken using a quantitative statistical approach to evaluate the linkage between competency-based human resource management and organizational performance. Data processing was executed through statistical software to generate accurate parameter estimates. Preliminary analysis involved summarizing respondent demographics and examining the distribution tendencies of each variable.

The robustness of the measurement model was ensured through validity and reliability assessment. Indicator validity was verified by examining the correlation strength between each item and its respective construct. Reliability was determined using Cronbach's alpha coefficient, where coefficients equal to or above 0.70 indicated acceptable internal

consistency. Only indicators that satisfied both criteria were incorporated into the regression analysis.

The independent variables in this study consist of competency development, training, and performance appraisal. Competency development was operationalized through indicators measuring employees' knowledge enhancement, skill improvement, and their ability to effectively perform job-related tasks. Training was measured using indicators related to the relevance of training content, the frequency of training participation, and the perceived effectiveness of training programs in supporting work performance. Performance appraisal was operationalized by indicators reflecting the clarity of evaluation criteria, the objectivity of the assessment process, and the provision of constructive performance feedback. All measurement items were adapted from established human resource management literature and assessed using a five-point Likert scale ranging from strongly disagree (1) to strongly agree (5), ensuring consistency and construct validity in quantitative analysis.

The dependent variable, organizational performance, was measured using indicators related to work effectiveness, productivity, service quality, and achievement of institutional goals. All variables were measured using a five-point Likert scale, ranging from strongly disagree (1) to strongly agree (5).

To test the hypotheses, multiple regression analysis was employed to examine the effect of competency development, training, and performance appraisal on organizational performance. This method allows for the simultaneous testing of multiple independent variables and their influence on the dependent variable. The regression model used in this study is formulated as follows:

$$\text{Organizational Performance} = \alpha + \beta_1 \text{Competency Development} + \beta_2 \text{Training} + \beta_3 \text{Performance Appraisal} + \epsilon$$

where α represents the constant, β_1 – β_3 represent regression coefficients, and ϵ denotes the error term. The results of the analysis provide empirical evidence regarding the significance and strength of the relationships among the research variables in the context of a maritime education institution.

4. Results and Discussion

4.1 Descriptive Statistics

This subsection outlines the statistical profile of the research variables to illustrate the overall data pattern. A descriptive examination was performed to summarize key indicators, including the observed range and central tendency measures for each construct.

The statistical output suggests that respondents tend to evaluate the implementation of competency-based human resource management at Politeknik Maritim Negeri Indonesia as relatively well established, reflecting perceptions that fall within moderate to relatively high categories.

Organizational performance shows a relatively high mean value, indicating that respondents perceive the institution's performance as satisfactory in terms of productivity, effectiveness, and service quality. Meanwhile, competency development and training variables also demonstrate high mean scores, suggesting that employees recognize the importance of skill enhancement and training programs in supporting their work performance. Performance appraisal records a moderate to high mean value, reflecting that evaluation systems are perceived as relatively clear and objective, although there remains room for improvement.

Overall, the descriptive statistics suggest that competency-based HRM practices are positively perceived and potentially contribute to organizational performance in the maritime education context.

4.2 Hypothesis Testing Results

Multiple regression analysis was employed to test the proposed hypotheses regarding the influence of competency development, training, and performance appraisal on organizational performance. The regression results indicate that all independent variables have positive coefficients, suggesting a positive relationship with organizational performance.

Competency development shows a positive and statistically significant effect on organizational performance. This finding supports H1, indicating that improved employee competencies contribute to higher levels of organizational effectiveness. Employees with adequate knowledge and skills are better equipped to perform their tasks and support institutional objectives.

Training also demonstrates a positive and significant effect on organizational performance, supporting H2. This result suggests that relevant and well-structured training programs enhance employee capabilities, adaptability, and productivity, which ultimately improve organizational outcomes.

Similarly, performance appraisal has a positive and significant effect on organizational performance, supporting H3. A transparent and competency-based performance appraisal system motivates employees to improve their performance and align their efforts with institutional goals.

The regression model indicates that competency-based HRM practices collectively explain a substantial proportion of the variance in organizational performance, highlighting their strategic importance in maritime education institutions.

4.3 Discussion

The findings of this study confirm the theoretical assumptions of Human Capital Theory and Strategic Human Resource Management, which emphasize the role of human resource investment in enhancing organizational performance. The positive effect of competency development aligns with the notion that employee competencies serve as valuable organizational assets, particularly in the maritime sector, where technical expertise and compliance with standards are critical.

The significant influence of training underscores the importance of continuous learning in maritime education institutions. Given the dynamic nature of maritime regulations and technological advancements, training programs enable employees to remain competent and responsive to change. This finding is consistent with previous studies that highlight training as a key driver of employee and organizational performance.

Furthermore, the positive effect of performance appraisal indicates that evaluation systems based on clear competency criteria foster accountability and motivation. In the context of Politeknik Maritim Negeri Indonesia, competency-based performance appraisal encourages employees to continuously improve their performance and supports institutional governance.

Overall, this study demonstrates that competency-based human resource management plays a crucial role in improving organizational performance in maritime education institutions. The results contribute empirical evidence to a relatively underexplored research context and provide practical insights for institutional leaders in designing effective HRM strategies.

5. Conclusions, Limitations, and Recommendations

This study concludes that competency-based human resource management plays a significant role in improving organizational performance at Politeknik Maritim Negeri Indonesia. The findings demonstrate that competency development, training, and performance appraisal have positive and significant effects on organizational performance. These results indicate that the alignment between employee competencies and institutional objectives enhances work effectiveness, productivity, and overall organizational outcomes. The study confirms the relevance of Human Capital Theory and Strategic Human Resource Management in explaining how investment in human resources contributes to performance improvement within the maritime education context.

From a theoretical perspective, this research contributes to the human resource management literature by providing empirical evidence from a maritime education institution, a context that has received limited attention in previous studies. The findings enrich the understanding of competency-based HRM practices and their influence on organizational performance, particularly in vocational and maritime-based institutions. Practically, the results offer valuable insights for institutional leaders and policymakers in designing and implementing human resource strategies that focus on systematic competency development, relevant training programs, and transparent performance appraisal systems.

Despite its contributions, this study has several limitations. The research focuses on a single maritime education institution, which may limit the generalizability of the findings to other maritime organizations or educational settings. In addition, the study relies on self-reported questionnaire data, which may be subject to respondent bias and perception-based limitations. Furthermore, this study examines only direct relationships between competency-based HRM practices and organizational performance, without considering potential mediating or moderating variables.

Future research is recommended to expand the scope of the study by involving multiple maritime institutions or maritime industries to enhance the generalizability of the results. Further studies may also incorporate additional variables, such as work motivation, leadership style, organizational culture, or digital human resource management, to provide a more comprehensive understanding of performance determinants. Moreover, the use of mixed-method or longitudinal approaches is suggested to capture deeper insights into the long-term impact of competency-based HRM practices on organizational performance.

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