INFLUENCE EDUCATIONAL COMPETENCE LENGTH SERVICE ON SHIP CREW PERFORMANCE THROUGH WORK ENGAGEMENT

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Abstract :

This study aims to analyze the effects of competence, education, and length of service on the performance of shipboard employees, as well as the mediating role of work engagement at PT Temas Shipping. The study involved all shipboard employees, with a total population of 50 people. Data were collected using primary data in the form of a 1–5 Likert-scale questionnaire that had been tested for validity and reliability. Data analysis employed a quantitative survey method. The findings indicate that: competence has a positive and significant effect on work engagement, (education has a positive and significant effect on work engagement, length of service has a positive and significant effect on work engagement, competence has a positive and significant effect on performance, education has a positive and significant effect on performance, length of service has a positive and significant effect on performance, work engagement has a positive and significant effect on performance, competence affects performance through work engagement as an intervening variable, education affects performance through work engagement as an intervening variable and length of service affects performance through work engagement as an intervening variable..

Keywords : *Competence, Education, Shipboard Employees, PT Temas Shipping*

INTRODUCTION

In today's era of globalization, every business faces intense competition. Each company competes in a global market consisting of various businesses. High-quality human resources with strong potential are therefore needed to improve each business's performance within the company (Loksyana, 2024).

The shipping industry is an important sector that requires human resources (HR) with high competence so that company performance is optimal. Employees' competence, education, and length of service are key factors that influence performance and work engagement (Suwanto et al, 2024). A limited liability company (PT) in the shipping sector requires a study to measure the influence of these variables in order to enhance productivity and the company's competitiveness (Putri et al, 2024).

One way to address these challenges is to improve employee performance. According to (Sinambela, 2020), performance (work achievement) is the qualitative and quantitative work result achieved by an employee in carrying out duties in accordance with the responsibilities assigned to them (Darmawan, 2024). In relation to employee performance, several organizational phenomena have emerged today, one of which is that employee performance has not been optimal. This is indicated by the low level of achievement of employees' performance targets compared with the targets that have been set (Musrinih, 2023).

The shipping industry demands reliable shipboard employee performance because it is directly related to safety, productivity, and operational efficiency (Fansca et al, 2025). In addition, work engagement has been shown to be an important factor linking human resources to organizational performance outcomes. Within PT TEMAS SHIPPING, variations in competence, educational background, and length of service among crew members raise questions about how these factors affect performance, both directly and through work engagement.

Furthermore, length of service is one internal factor that can influence employees' productivity in performing their work. The longer a person's tenure, the more their skills and ability to complete tasks should improve. Continuous work experience can help an individual become more technically proficient (Amar & Fikri, 2020). Employees with strong work experience are more likely to improve their work achievement.

Length of service is a personal condition within the concept of individual characteristics that is often studied, so it can be said that a sufficiently long tenure is comparable to seniority within an organization (Minarsih & Dekawati, 2024). Other factors that influence the failure to achieve maximum organizational performance include competence, education, and length of service. Work competence, education or training, and length of service covering discipline and work behavior are factors that encourage engagement at work (Falah, 2024).

Based on the phenomena occurring at PT TEMAS SHIPPING, the researcher is interested in conducting a study related to these phenomena, entitled "The Influence of Competence, Education, and Length of Service on Shipboard Employees' Performance through Work Engagement".

RESEARCH METHOD
Research Approach

The approach used in this study is an associative approach. An associative approach is an approach used to determine whether there is a relationship or influence between two variables (independent variables and dependent variables). In this study, the independent variables are X1 (Competence), X2 (Education), and X3 (Length of Service), while the dependent variable is Y (Performance) and Z (Work Engagement).

Time and Place of Study

The study was conducted from November to December 2025.

Population and Sample

Population

The population in this study comprised all ship employees of PT TEMAS SHIPPING in the engineering department whose vessels sailed to Jakarta, as recorded in November 2025, totaling 50 people.

Sample

Because the population size was small, the sampling technique used in this study was a saturated sample, meaning that the sample included the entire population. In this study, the sample size was 50 people.

Operational Definition of Variables

An operational definition is a further elaboration of a conceptual definition that is classified in the form of variables as a guide to measure and determine the quality of measurement in a study. The operational definitions in this study are as follows:

Table 1. Operational Definition of Variables

Variable	Definition	Indicators	Scale
Performance (Y)	Performance is the work output achieved by an employee based on job requirements, assessed in terms of quality, quantity, timeliness, and the methods used as a form of performance assessment and evaluation in the organization.	1. Quality 2. Quantity 3. Timeliness 4. Effectiveness 5. Independence 6. Work commitment	Likert
Competence (X1)	Competence is a combination of knowledge, skills, and personal attributes that can enhance performance and contribute to organizational success.	1. Technical knowledge of shipboard work 2. Operational skills and capabilities 3. Professional attitude and responsibility 4. Communication and teamwork skills	Likert
Education (X2)	Education is a process of learning and developing a person's abilities systematically to achieve certain objectives.	1. Level of formal education 2. Relevance of education to the job 3. Training and professional certification 4. Application of knowledge in the workplace	Likert

Length of Service (X3)	Length of service is the duration or a certain period of time that a person has worked in a workplace.	1. Work experience 2. Understanding of operational procedures 3. Ability to handle situations at sea 4. Loyalty to the company	Likert
Work Engagement (Z)	Work engagement is an employee's psychological condition that reflects the level of dedication, involvement, and high loyalty to their work.	1. Vigor (enthusiasm and work energy) 2. Dedication (a sense of pride and meaning at work) 3. Absorption (full involvement in work)	Likert

Sources and Data Collection Techniques

Types and Sources of Data

In this study, the researcher used primary data and secondary data. According to Lestari (2023), data types and sources are divided into two, namely:

Primary Data

Primary data are data that are first recorded and collected by the researcher. The primary data in this study were obtained through questionnaires.

Secondary Data

Secondary data are data that are already available and have been collected by other parties.

Data Collection Techniques

The data collection techniques used were:

1. Questionnaire, by preparing a list of questions in the form of a questionnaire addressed to employees.
2. Documentation study, by collecting company/institution data related to the research needs.

Instrument Testing

Validity Test

A questionnaire is considered valid if the questions in the questionnaire can reveal what is intended to be measured.

Reliability Test

The indicator for the reliability test is Cronbach's Alpha.

Classical Assumption Tests

Normality Test

A reliable method is to examine the normal probability plot, which compares the cumulative distribution of the actual data with the cumulative distribution of a normal distribution.

Multicollinearity Test

One way to detect the presence or absence of multicollinearity is the Farrar-Glauber test (calculation of the ratio-F to test the location of multicollinearity).

Heteroscedasticity Test

The chart method (scatterplot diagram) is based on the following rationale, If there is a certain pattern, such as points forming a regular pattern (wavelike, widening, then narrowing), heteroscedasticity occurs. If there is no clear pattern and the points spread above and below 0 on the Y-axis, heteroscedasticity does not occur.

RESULTS AND DISCUSSION
Results
Respondent Characteristics
Respondent Characteristics by Age

The characteristics of respondents at PT Temas Shipping in 2025 by age group are as follows:

Table 1. Respondent Characteristics by Age

No.	Age	Total	Percentage
1.	< 30 Years	15	30 %
2.	30-39 Years	18	36 %
3	40-50 Years	11	22 %
4	> 50 Years	6	12 %
Total	Total 50	Total 50	100%

Source: Processed Primary Data, 2025

From the table above, it can be seen that the majority of respondents are aged 30–39 years, with 18 respondents (36%). Meanwhile, the minority of respondents are aged > 50 years, with 6 respondents (12%).

Respondent Characteristics by Last Education

The characteristics of respondents at PT Temas Shipping in 2025 based on last education are as follows:

Table 2. Respondent Characteristics by Last Education

No.	Education	Total	Percentage
1	Three-Year Diploma	24	48 %
2	ATT II	13	26 %
3	ATT 1	13	26 %
	Total	50	100%

Source: Processed Primary Data, 2025

From the table above, it can be seen that the majority of respondents have a Three-Year Diploma as their last education, with 24 respondents (48%). Meanwhile, the number of respondents whose last education is ATT I and ATT II is the same, namely 13 respondents (26%) each.

Respondent Characteristics by Position on Board

The characteristics of respondents at PT Temas Shipping in 2025 based on their position on board are as follows:

Table 3. Respondent Characteristics by Position on Board

No.	Position on Board	Total	Percentage
1	Chief Engineer	13	26 %
2	Engineer	26	52 %
3	Other Crew Members	11	22 %
	Total	50	100%

Source: Processed Primary Data, 2025

From the table above, it can be seen that the majority of respondents hold the position of Engineer, totaling 26 respondents (52%). Meanwhile, the number of respondents who hold other crew positions is 11 respondents (22%).

Respondent Characteristics by Length of Service

The characteristics of respondents at PT Temas Shipping in 2025 based on length of service are as follows:

Table 4. Respondent Characteristics by Length of Service

No.	Length of Service	Total	Percentage
1	< 1 Years	4	8 %
2	1– 3 Years	6	12 %
3	4 − 6 Years	33	66 %
4	> 6 Years	7	14 %
	Total	50	100 %

Source: Processed Primary Data, 2025

From the table above, it can be seen that the majority of respondents have a length of service of 4–6 years, totaling 33 respondents (66%). Meanwhile, the minority of respondents have a length of service of < 1 year, totaling 4 respondents (8%).

Results of Descriptive Statistical Analysis for the Performance Variable

The results of descriptive statistical analysis of respondents' responses (31 respondents) for the Performance variable, which has been broken down into 6 statements, are presented in the following table:

Table 5. Results of Descriptive Statistical Analysis for the Performance Variable

Statement Items	SS		S		KS		TS		STS		Mean Score	Category
	F	%	F	%	F	%	F	%	F	%		
I am able to produce high-quality work results by utilizing my skills and abilities.	21	42	21	42	8	16	0	0	0	0	4,26	Very Good
I am able to complete a number of units or task cycles within a specified time. I am able to finish tasks at the beginning of the specified time.	21	42	21	42	8	16	0	0	0	0	4,26	Very Good

Statement Item	SS		S		KS		TS		STS		Mean	Category
I utilize organizational resources in the form of labor, funds, technology, and raw materials to achieve optimal performance.	22	44	19	38	9	18	0	0	0	0	4,26	Good
I am able to work independently with or without direction and assistance from others.	18	36	23	46	9	18	0	0	0	0	4,13	Good
I am fully committed to completing every task and responsibility that has been assigned.	19	38	21	42	10	20	0	0	0	0	4,13	Good

Results of Descriptive Statistical Analysis for the Competence Variable

The results of descriptive statistical analysis of respondents' responses (50 respondents) for the Competence variable, which has been broken down into 5 statements, are presented in the following table:

Table 6. Results of Descriptive Statistical Analysis for the Competence Variable

Statement Items	SS	S	KS	TS	STS	Mean	Category
ship equipment meets standards							
toward the tasks assigned							
effective							

The table above shows that, on average, the responses to each statement regarding the competence of PT Temas Shipping employees fall within the "Good" category.

Results of Descriptive Statistical Analysis for the Education Variable

The results of the descriptive statistical analysis of respondents' responses/answers (50 respondents) to the Education variable, which was elaborated into 5 statements with the responses presented in the following table:

Table 7. Descriptive Statistical Analysis Results for the Education Variable

Statement Item	SS	S	KS	TS	STS	Mean	Category
Seafarer certification							
Team on board the ship							

Results of Descriptive Statistical Analysis for the Length of Service Variable

The results of the descriptive statistical analysis of respondents' responses/answers (50 respondents) to the length of service variable.

Table. Descriptive Statistical Analysis Results for the Length of Service Variable

Statement Item	SS	S	KS	TS	STS	Mean	Category
With working conditions at sea							
The better my performance							Good

Results of Descriptive Statistical Analysis for the Work Engagement Variable

The results of the descriptive statistical analysis of respondents' responses/answers (50 respondents) to the Work Engagement variable, which was elaborated into 5 statements with the responses presented in the following table:

Table 8. Descriptive Statistical Analysis Results for the Work Engagement Variable

Statement Item	SS	S	KS	TS	STS	Mean	Category
Enthusiastic every day							
Meaningful to me							
In my work until I lose track of time							

Classical Assumption Test of Sub-Model I
Normality Test

The basis for decision-making in the normality test can be carried out through the non-parametric Kolmogorov–Smirnov (K–S) statistical test by examining the value in the Asymp. Sig. (2-tailed) column > level of significance (α = 5%). The obtained Asymp. Sig. (2-tailed) value is 0.200. Because the Asymp. Sig. (2-tailed) value is greater than 0.05, it can be concluded that the regression model meets the normality assumption.

Multicollinearity Test

The multicollinearity test results show that the VIF and tolerance values are as follows: the Competence variable (X1) has a VIF value of 1.013 and a tolerance value of 0.987. The Education variable (X2) has a VIF value of 1.013 and a tolerance value of 0.987.

Heteroskedasticity Test

The basis for decision-making in the heteroskedasticity test can be carried out using the Glejser test by comparing the resulting significance values. If the significance value > 0.05, then heteroskedasticity does not occur; however, if the significance value < 0.05, then heteroskedasticity occurs. The obtained sig.

values are > 0.05, therefore it can be concluded that heteroskedasticity does not occur.

Hypothesis Testing of Sub-Model I

The hypothesis states that Competence (X1), Education (X2), and Length of Service (X3) have a positive and significant effect on Work Engagement (Z). The t-statistical test results are as follows:

1. The Competence variable (X1) has a t-count value (3.460) > t-table (1.699) with a significance probability level (Sig) of 0.002 (< 0.05). This indicates that Competence has a significant effect on the Work Engagement variable.
2. The Education variable (X2) has a t-count value (2.421) > t-table (1.699) with a significance probability level (Sig) of 0.022 (< 0.05). This indicates that Education has a significant effect on the Work Engagement variable.
3. The Length of Service variable (X3) has a t-count value (3.460) > t-table (1.699) with a significance probability level (Sig) of 0.002 (< 0.05). This indicates that Competence has a significant effect on the Work Engagement variable.

Classical Assumption Test of Sub-Model II

Normality Test

The basis for decision-making in the normality test can be carried out through the non-parametric Kolmogorov–Smirnov (K–S) statistical test by examining the value in the Asymp. Sig. (2-tailed) column > level of significance (α = 5%). The obtained Asymp. Sig. (2-tailed) value is 0.200. Because the Asymp. Sig. (2-tailed) value > 0.05, it can be concluded that the regression model meets the normality assumption.

Heteroskedasticity Test

The basis for decision-making in the heteroskedasticity test can be carried out using the Glejser test by comparing the resulting significance values. If the significance value > 0.05, then heteroskedasticity does not occur; however, if the significance value < 0.05, then heteroskedasticity occurs. The obtained sig. values are > 0.05, therefore it can be concluded that heteroskedasticity does not occur.

Hypothesis Testing of Sub-Model II

The hypothesis test results state that Competence (X1) has a significant effect on Performance (Y), Education (X2) has a significant effect on Performance (Y), Length of Service (X3) and Work Engagement (Z) have a significant effect on Performance (Y). The t-statistical test results are as follows:

1. The Competence variable (X1) has a t-count value (2.588) > t-table (1.701) with a significance probability level (Sig) of 0.015 (< 0.05). This indicates that Competence has a significant effect on the Performance variable.
2. The Education variable (X2) has a t-count value (4.117) > t-table (1.701) with a significance probability level (Sig) of 0.000 (< 0.05). This indicates that Education has a significant effect on the Performance variable.
3. The Length of Service variable (X3) has a t-count value (2.588) > t-table (1.701) with a significance probability level (Sig) of 0.015 (< 0.05). This

indicates that Length of Service has a significant effect on the Performance variable.

4. The Work Engagement variable (Z) has a t-count value (2.060) > t-table (1.701) with a significance probability level (Sig) of 0.049 (< 0.05). This indicates that Work Engagement has a significant effect on the Performance variable.

Path Analysis of Sub-Model II

The analysis results show that the direct effect of Competence (X1) on Performance (Y) is 0.381. Meanwhile, the indirect effect of Competence (X1) on Performance (Y) through Work Engagement (Z) is 0.425 x 0.316 = 0.134. Therefore, the total effect of the Competence variable (X1) on Performance (Y) is the direct effect plus the indirect effect, namely 0.381 + 0.134 = 0.515.

Table 9. Total Effect Values

No.	Effect		Direct Effect	Indirect Effect	Total Effect
1	Competence Performance	→	0.381	0.425 x 0.316 = 0.134	0.515
2	Education Performance	→	0.557	0.367 x 0.316 = 0.115	0.672
3	Length of Service Performance	→	0.381	0.425 x 0.316 = 0.134	0.515

Sobel Test

With the criterion that if the Sobel test statistic ≥ 1.96 with significance < 0.05, then the variable can be said to be able to mediate between the independent variable and the dependent variable.

Table 10. Sobel Test Results

Mediation Path	Unstandardized	Std. Error	Test Statistic	Std. Error	P-Value
Competence → Work Engagement; Work Engagement → Performance	0.572; 0.170	0.079; 0.083	1.970	0.049	0.048
Education → Work Engagement; Work Engagement → Performance	0.589; 0.170	0.078; 0.083	1.976	0.050	0.048
Length of Service → Work Engagement; Work Engagement → Performance					

Source: Data processed using Calculation for the Sobel Test, 2025.

Discussion
The Effect of Competence on Work Engagement

The Competence variable has a positive and significant effect on Work Engagement at PT Temas Shipping. The Competence variable has a regression coefficient value of 0.572, indicating that if Competence increases by 100%, it will increase Work Engagement by 57.2%.

Based on the results of testing the first hypothesis, it is known that Competence has a significant effect on Work Engagement at PT Temas Shipping. This is supported by research conducted by Artati & Suyati, (2024) entitled "The Effect of Competence and Engagement on Employee Performance: The Mediation Role of Organizational Citizenship Behavior", and by Sjarifudin et al, (2023) entitled "The effect of self-efficacy, competence, work discipline, employee engagement on work performance and work motivation: Empirical study on Umrah Travel Agency", which states that Competence has an influence on Work Engagement.

The Effect of Education on Work Engagement

The Education variable has a positive and significant effect on Work Engagement at PT Temas Shipping. The Education variable has a regression coefficient value of 0.589, indicating that if Education increases by 100%, it will increase Work Engagement by 58.9%.

Based on the results of testing the first hypothesis, it is known that Education has a significant effect on Work Engagement at PT Temas Shipping. This is supported by research conducted by Abd Kaiyom et al, (2021) entitled "The effect of workload, supervisor support and co-workers support on work engagement among teachers", and Abdelwahed & Doghan, (2023) entitled "Developing employee productivity and performance through work engagement and organizational factors in an educational society".

The Effect of Competence on Performance

The Competence variable has a positive and significant effect on Performance at PT Temas Shipping. The Competence variable has a regression coefficient value of 0.106, indicating that if Competence increases by 100%, it will increase Performance by 10.6%.

Based on the results of testing the first hypothesis, it is known that Competence has a significant effect on Performance at PT Temas Shipping. This is supported by research conducted by Amdani et al, (2022) entitled "The effect of competence and organizational culture on employee performance of ganesha medan polytechnic", and Corbeanu & Iliescu, (2023) entitled "The link between work engagement and job performance", which states that Competence has an effect on Performance.

The Effect of Education on Performance

The Education variable has a positive and significant effect on Performance at PT Temas Shipping. The Education variable has a regression coefficient value of 0.155, indicating that if Education increases by 100%, it will

increase Performance by 15.5%.

Based on the results of testing the first hypothesis, it is known that Education has a significant effect on Performance at PT Temas Shipping. This is supported by research conducted by Nawangsari et al, (2023) entitled "Organizational Commitment Mediating the Influence of Training and Work Motivation on Employee Performance", and Riadi et al, (2025) entitled "Islamic work ethics-based organizational citizenship behavior to improve the job satisfaction and organizational commitment of higher education lecturers in Indonesia".

CONCLUSION

Based on the results of research on the influence of competence, education, and tenure on the performance of ship employees through work engagement at PT Temas Shipping, it can be concluded that competence, education, and tenure have a positive and significant influence on employee work engagement. This indicates that the higher the level of competence, education, and length of work experience of employees, the higher the employee's level of engagement with their work.

Furthermore, competence, education, and tenure have also been shown to have a positive and significant influence on the performance of ship employees. Employees with strong competence, appropriate educational backgrounds, and longer work experience tend to be able to complete their work more effectively, efficiently, and with quality. This contributes directly to improved individual performance in carrying out operational tasks on ships.

The results also indicate that work engagement has a positive and significant influence on employee performance. Employees with high work engagement tend to demonstrate enthusiasm, dedication, and strong involvement in their work, thereby improving their work results. Furthermore, work engagement has been shown to mediate the relationship between competence, education, and tenure on employee performance. Thus, increasing competence, education, and tenure not only directly improves performance but also through increased employee work engagement.

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