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# THE EFFECT OF TRAINING AND COMPETENCY ON SHIPPING SAFETY PERFORMANCE (STUDY AT TANJUNG EMAS PORT SEMARANG)

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## ABSTRACT

Shipping safety performance cannot be separated from the quality of sea transportation. The performance of sea transportation safety is a very important factor because it is related to the efforts of the Directorate General of Sea Transportation in realizing effective and efficient sea transportation. Human resources are one of the factors that cause shipping safety performance is not optimal. The results of this study indicate that the problems that occur in shipping safety performance are caused by the competency factor of the workers on board that are not yet optimal. In connection with this phenomenon, this study intends to empirically examine the effect of training and competence on shipping safety performance. Related to this objective, data on training, competence and performance of shipping safety was collected through interviews using questionnaires to workers on board ships at Tanjung Emas Port, Semarang. The data obtained were then analyzed using the Structural Equation Modeling approach to test the research model and the influence between variables. The results of this study indicate that the performance of shipping safety is caused by the competence factor of the above workers when it is not optimal. In addition to competence, this study also shows that problematic shipping safety performance is caused by low training factors. This study also shows that the provision of training can shape and build the competencies needed to support shipping safety performance.

**Keywords: Training, competence, shipping safety performance.**

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## INTRODUCTION

Indonesia is the largest archipelagic country in the world with the number of islands reaching 18,108 (http://io.ppi-jepang.org) which are connected by the ocean so that it requires sea transportation services to serve the mobility of people, goods and services, to stimulate (excite or promote) the economic growth in the areas that have not developed (ship promotes the trade), to support (bolster or buttress) the trading sector, the economy sector and other sectors (ship follows the trade), to support the competitiveness of national production commodities both domestically and abroad as well as a means to strengthen national unity and integrity (Malisan & Jinca, 2012). Therefore, sea transportation is the lifeblood of the economic, social, political, and cultural as well as defense and security of the Indonesian Archipelago State (Ministry of Transportation, 2007; Munawar, 2007; Malisan & Jinca, 2012).

According to the Department of Transportation (2007), there are three aspects related to sea transportation, namely traffic and sea transportation facilities, ports, and marine safety. The aspect of the scope of sea transportation is closely related to the professionalism of the shipping company, the route and operation of the ship, the type of ship and the participation of the private sector in the operation of sea transportation. The port aspect is related to the capacity and facilities of the port, its role and function, as well as the impact of globalization and liberalization. Furthermore, the aspects of shipping safety are more related to seaworthiness, airport order, navigation, shipping telecommunications, law enforcement at sea, disaster management and other maritime services. The aspect of shipping safety is the main aspect in sea transportation and is an inseparable part of sea transportation services.

The implementation of sea transportation is currently facing threats due to the low performance and competitiveness of national sea transportation. This can be seen from the indications of the marginal national marine business, relatively low port services, the safety of sea transportation which is still concerning and the high level of security disturbances and sea pollution. These problems have been accumulated so that sea transportation becomes high cost, high risk and the water area is classified as black spot (Unreliable Area) (Ministry of Transportation, 2006).

Of the many problems faced by sea transportation, the safety aspect of sea transportation is a very important factor because it is related to the efforts of the Directorate General of Sea Transportation in realizing the effective and efficient sea transportation. In addition, there are facts that show the high incidence of shipping accidents or ship accidents that claimed lives, and property and objects (Ministry of Transportation, 2007). The occurrence of shipping accidents shows that the current implementation of shipping safety has not been optimal yet. Data from the Ministry of Transportation (2007) states that the implementation of shipping safety that has not been optimal lies in the institutional aspects, legality, human resources, shipping safety facilities, sea transportation facilities and technical implementation in the field (Buku Statistik Investigasi Kecelakaan Transportasi KNKT, 2021).

Furthermore, based on the results of the analysis and evaluation of various data and information related to the significant factors causing ship accidents in Indonesia conducted by the Ministry of Transportation (2007), it was stated that 72% was caused by human resource errors with the distribution: 52% pure human error, 9.8% combination of human resources and technical errors, 5.3% combination of human resources and natural errors and 4.9% combination of human resources and technical as well as natural errors. Of the 72% of the causes of accidents due to human resource errors above (Iswanto, 2009; Malisan & Jinca, 2012), it can be identified and described the human resource parties who make these contributions, namely the crew and the captain, the owner of the ship, the harbormaster and his equipment, the shipping classification bureau and guidance. Based on the phenomena, this research was conducted to examine the empirically low performance of shipping safety.

Previous research studies regarding the factors that affect performance have been carried out in this study. The first factor is competence. Competence is closely related to the employees' characteristics which refer to their ability to produce superior performance in the form of work, attitudes, and behavior in various situations within the company. Therefore, building and strengthening competencies must be carried out not only by individual employees but also by being part of the company. Training is one of the efforts made by the company to build and strengthen individual competencies. This is because training is related to processes and activities that are directed to shape or change the knowledge, attitudes and behavior of employees in order to be able to meet the demands of work in the company. Shipping safety is the performance of the entire team of the workers on the ship. To achieve shipping safety, the workers on board need to have good abilities and skills related to shipping activities. Good abilities and skills can theoretically be pursued through training. Competence is closely related to the ability and the adequate skills to perform. Competence in the shipping sector will certainly have implications on shipping safety performance.

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## METHODOLOGY

### Population and Sample

#### Population

Population is all objects, symptoms and occurrences of events that will be selected which must be in accordance with the problem to be studied (Hadi, 2001). Thus, in this study, the population is all ship crew members (ABK) and the captain, the ship owner, harbormaster and his equipment, classification bureau, and guidance in the Port of Tanjung Emas Semarang.

#### Sample

The definition of the sample in question is a part or the representative of the population studied (Hadi, 2001). The research sample was determined using the following inclusion criteria: 1) Ship crew members (ABK) and the captain, the ship owner, harbormaster and his equipment, the classification bureau, and guidance at the Port of Tanjung Emas Semarang during the research period, 2) have worked in the same profession for at least 3 consecutive years. Based on these criteria, the research sample obtained was 112 respondents.

### Research Variables, Operational Definitions and Indicators Development

The following is an explanation of the variables studied in this study, operational definitions and the development of indicators as a measuring instrument of research variables.

### Method of Collecting Data

To collect the research data, a structured interview method with respondents was used to obtain information about the variables studied by using questionnaire. The type of question in the questionnaire is a closed question where respondents are asked to make a choice among a series of alternatives provided by the researcher (Sekaran, 2006). To determine the scale of respondents' attitudes to research questions, the Agree Disagree Scale in the range of 1-10 was used.

### Analysis Technique

The testing of empirical models and the research hypotheses using empirical data obtained from interviews using questionnaires was carried out using the Structural Equation Modeling (SEM) approach which was run with the AMOS application.

## RESULTS AND DISCUSSION

### The Analysis of Research Data

Data analysis carried out in this study consisted of the confirmatory analysis, the empirical model analysis and the analysis of the influence among variables. The followings are the interpretation of each data analysis.

### Confirmatory Analysis

Confirmatory analysis is the stage of data analysis carried out to confirm the accuracy and consistency of the indicators used as measuring instruments for each research variables (Table 2). Confirmatory analysis was performed using the following criteria:

a. If the standardized regression weight value is > 0.6 with a significance value < 0.05, it indicates that the indicators used are able to reflect the variables studied so that they are the right measuring tools to measure the variables studied.

Table 1. Field observation results

| Research Variables | Operational Definitions | Indicators | Sources |
|---|---|---|---|
| Training | Activities that aim to increase or improve abilities in order to meet the demands of today's work | X1: The assistance to master skills<br>X2: The assistance to fix deficiency<br>X3: The assistance to improve abilities<br>X4: Fulfilling the demands of work | Nawawi (2001) |
| Competence | A person's abilities that are useful in supporting work | X5: Skills<br>X6: Knowledge<br>X7: Attitude | Spencer and Spencer (1993); Tristanto, Dicky (2005) |
| Shipping Safety Performance | Actions taken to prevent shipping accidents | X8: Safety management<br>X9: Pollution prevention<br>X10: Security management<br>X11: Manning<br>X12: Loading line<br>X13: Loading<br>X14: The welfare of the ship crew<br>X15: Legal status of the ship | Law No. 17 of 2008 |

Source: Adopted from Previous Research for this Study, 2022

Table 2. Confirmatory Analysis Results

| | | | Std Estimate | Estimate | S.E. | C.R. | P |
|---|---|---|---|---|---|---|---|
| X1 | <--- | Training | .877 | 1.000 | | | |
| X2 | <--- | Training | .861 | .978 | .085 | 11.561 | *** |
| X3 | <--- | Training | .845 | 1.036 | .089 | 11.598 | *** |
| X4 | <--- | Training | .740 | .818 | .090 | 9.058 | *** |
| X5 | <--- | Competence | .725 | 1.000 | | | |
| X6 | <--- | Competence | .734 | 1.031 | .157 | 6.586 | *** |
| X7 | <--- | Competence | .792 | 1.116 | .170 | 6.579 | *** |
| X8 | <--- | Shipping_Safety_Performance | .753 | 1.000 | | | |
| X9 | <--- | Shipping_Safety_Performance | .851 | 1.060 | .116 | 9.145 | *** |
| X10 | <--- | Shipping_Safety_Performance | .865 | 1.024 | .109 | 9.378 | *** |
| X11 | <--- | Shipping_Safety_Performance | .835 | .978 | .109 | 8.959 | *** |
| X12 | <--- | Shipping_Safety_Performance | .740 | .902 | .114 | 7.942 | *** |
| X13 | <--- | Shipping_Safety_Performance | .002 | .003 | .163 | .017 | .987 |
| X14 | <--- | Shipping_Safety_Performance | -.008 | -.014 | .171 | -.083 | .934 |
| X15 | <--- | Shipping_Safety_Performance | -.145 | -.241 | .166 | -1.452 | .147 |

Source: Primary Data Processed, 2022

b. If the standardized regression weight value is < 0.6 with a significance value > 0.05, it indicates that the indicators used cannot reflect the variables studied, which means that the indicators are not the right measuring tools to measure the variables studied.

Based on the results of the confirmatory analysis presented in the table above, the following findings were obtained:

a. The training variable was measured by adopting four indicators from Nawawi (2001). The standardized regression weight value and the significance value for the four indicators produce values that meet the required criteria so that it can be concluded that the four indicators are the right measuring tools to reflect the training variable.
b. The competence variable was measured by adopting three indicators from Spencer & Spencer (1993); Tristanto (2005). The standardized regression weight value and the significance value for the three indicators produce values that meet the required criteria so that it can be concluded that the three indicators are the right measuring tools to reflect the competence variable.
c. The shipping safety performance variable was measured by adopting eight indicators from Law No. 17 of 2008. The standardized regression weight and significance values for indicators X8 – X12 produce values that meet the required criteria, while indicators X13 – X15 produce standardized regression weight values and significant values that do not meet the required criteria. Referring to the results of the confirmatory analysis, only indicators X8 – X12 are able to reflect the variables of shipping safety performance.

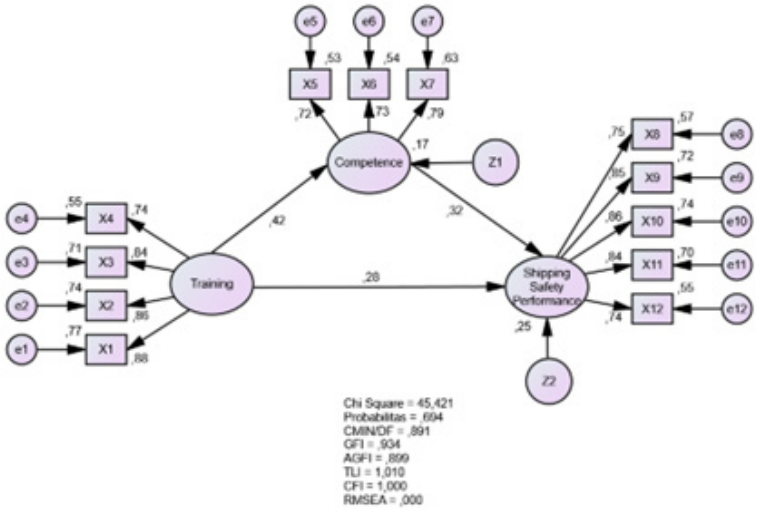


Figure 1. Empirical Model Analysis. Source: Processed Primary Data, 2022

**Empirical Model Analysis**

Empirical model analysis is an analysis carried out to determine the results of statistical tests on the accuracy or feasibility of the empirical model developed in this study to explain the occurrence of variations in shipping safety performance in the estimated population (Figure 1).

The testing of the accuracy or feasibility of the empirical model was carried out by comparing the value of the requirements with the value of the estimated results of the model testing carried out using empirical data.

Table 3 above presents the value of the criteria and the value of the estimation results. The testing of the feasibility or accuracy of the empirical model was carried out by analyzing the statistical values which include calculated Chi Square values and probability values as well as index values which include CMIN/ DF, GFI, AGFI, TLI, CFI and RMSEA. The calculated Chi Square from the empirical model estimation obtained a value of 45,421 < table Chi Square of 68,669 with the probability value of 0.694 < 0.05. Index values also generated values that meet the theoretically required criteria. Referring to the estimation results, it can be concluded that the empirical model developed in this study is the feasible or appropriate model for estimating the occurrence of changes in shipping safety performance explained by the effect of training and competence on the estimated population.

**Hypothesis Analysis**

Hypothesis analysis is an analysis carried out to test the significance of the effect among the research variables. Research hypothesis testing was carried out with reference to the following criteria:

a. If the significance value of the effect among variables is <0.05, it means that the exogenous variable is statistically proven to have significant effect on the endogenous variable.
b. If the significance value of the effect among variables is > 0.05, it means that the exogenous variable is not statistically proven to have significant effect on the endogenous variable.

The results of the research hypothesis testing can be explained as follows:

a. The Effect of Training on Competence
   The testing of the effect on the training and competence variables obtained the probability value of 0.000. The probability value (0.000) is < the value of ά that is 0.05. Referring to the estimation results, it can be concluded that training has significant positive effect on competence.
b. The Effect of Training on Shipping Safety Performance
   The presence or absence of the effect of training on shipping safety performance is tested in this study using empirical data. The tests carried out resulted in a probability value = 0.012 < ά value = 0.05. Based on the estimation results, it can be proven that statistically, training has significant positive effect on shipping safety performance.

Table 3. Confirmatory Analysis Results

| | Cut of Value | Results | Criteria |
|---|---|---|---|
| Chi Square ( df = 51) | < 68.669 | 45.421 | Good |
| Probability | > 0.05 | 0.694 | Good |
| CMIN/DF | < 2.00 | 0.891 | Good |
| GFI | > 0.90 | 0.934 | Good |
| AGFI | > 0.90 | 0.899 | Marginal |
| TLI | > 0.95 | 1.010 | Good |
| CFI | > 0.95 | 1.000 | Good |
| RMSEA | < 0.08 | 0.000 | Good |

Source: Processed Primary Data, 2022

Table 4. Confirmatory Analysis Results

| | | | Std Estimate | Estimate | S.E. | C.R. | P |
|---|---|---|---|---|---|---|---|
| Competence | <--- | Training | .416 | .334 | .091 | 3.679 | *** |
| Shipping Safety Performance | <--- | Training | .278 | .260 | .103 | 2.520 | .012 |
| Shipping Safety Performance | <--- | Competence | .321 | .373 | .141 | 2.638 | .008 |

Source: Processed Primary Data, 2022

c. The Effect of Competence on Shipping Safety Performance

Competence and shipping safety performance were also tested for their effects in this study using empirical data. The performed statistical estimation obtained significance value of 0.008 < ά value = 0.05, which means that the hypothesis stating that competence has significant positive effect on shipping safety performance can be accepted and proven statistically.

**Discussion**

1. The Effect of Training on Competence

The first objective of this study is to examine the effect of training on competence empirically. The results of these tests indicate that training is statistically proven to have significant positive effect on competence. That is, if the training provided to the respondents is improved, this will have an impact on strengthening the competence of the respondents. The findings of this study are in line with the findings of previous studies conducted by Mulyono & Meilani (2016), Fajariah (2019) and Mujiatun (2015) which showed that training had significant positive effect on competence.

2. The Effect of Training on Shipping Safety Performance

The testing of the effect of training on shipping safety performance has been tested in this study using empirical data. The results of this study indicate that training is statistically proven to have significant positive effect on shipping safety performance. This means that the provision of improved training will be able to encourage the improved shipping safety performance. The previous studies conducted by Yunidasari *et al*. (2020), Wijayanto & Dotulong (2017), Elizar & Tanjung (2018), Kartika *et al*. (2015) also show that training has significant effect on variations in shipping safety performance.

3. The Effect of Competence on Shipping Safety Performance

The presence or absence of the effect of competence on the shipping safety performance has been studied empirically in this study. The results show that competence is statistically proven to have significant positive effect on shipping safety performance. This means that the increase or decrease in shipping safety performance is caused by an increase or decrease in the respondent's competence. Several previous studies conducted by Wijayanto & Dotulong (2017), Yunidasari *et al*. (2020), and Elizar & Tanjung (2018) are also in line with the results of this study that competence has significant positive effect on shipping safety performance.

**CONCLUSION**

The results of this study indicate that the problems that occur in shipping safety performance are caused by the competence factor of the on board workers that is not optimal yet. In addition to competence, this study shows that problematic shipping safety performance is caused by low training factor. This study also shows that the provision of training can shape and build the competencies needed to support shipping safety performance.Based on the results of the empirical studies in this study, to improve the shipping safety performance, competence that support the implementation of performance criteria. Meanwhile, the competence and shipping safety performance require training. Therefore, it is necessary to strive for training so that it can be carried out regularly to improve the skills and the abilities that are up to date. The training provided must consider the demands of fulfilling the job description of the employees within the company.

**REFFERENCE**

Komite Nasional Keselamatan Transportasi (2021, in Indonesian). NTSC Transportation Accident Investigation Statistics Book. Jakarta.

Departemen Perhubungan: Badan Penelitian dan Pengembangan (2006, in Indonesian). Study of Adpel Work Standards in the Context of Improving Ship and Goods Services at Ports. Pusat Penelitian dan Pengembangan Perhubungan Laut. Jakarta.

Departemen Perhubungan: Badan Penelitian dan Pengembangan (2007, in Indonesian). Sailing Safety Improvement Study. Pusat Penelitian dan Pengembangan Perhubungan Laut. Jakarta.

Elizar., & Tanjung, H. (2018, in Indonesian). Effect of Training, Competence, Work Environment on Employee Performance. *Maneggio: Jurnal Ilmiah Magister Manajemen, 1*(1), 46-58. DOI: https://doi.org/10.30596/maneggio.v1i1.2239

Fajariah, F. (2019, in Indonesian). The Effect of Training on the Motivation and Competence of STIE AMM Mataram Lecturers. *Proceeding Indonesia Career Center Network Summit IV*, 156-166.

Hadi, S. (2001, in Indonesian). *Statistics*. Yayasan Penerbitan Fakultas Psikologi Universitas Gadjah Mada, Yogyakarta.

Idrus, S.I. (2019, in Indonesian). The Influence of Training and Motivation on Managerial Competence of Civil Servants of the Secretariat General and Expertise Body of the People's Representative Council of the Republic of Indonesia. *Jurnal Mirai Management, 5*(1), 1-26.

Instruksi Presiden (Inpres) No.15 tahun 1974

tentang Pembentukan Badan Perencanaan Pembangunan Daerah.

Iswanto. (2009, in Indonesian). National Sea Transportation Fleet Development Strategy in the Global Era. *Jurnal Sains dan Teknologi Maritim, 7*(2).

Kartika, H.A., Hamid, D., & Ruhana, I. (2015, in Indonesian). The Effect of Training on Occupational Health and Safety (Study on Employees in the Production Section of CV. Bangkit Sukses Makmur). *Jurnal Administrasi Bisnis (JAB), 26* (2), 1-6.

Malisan, J., & Jinca, M.J. (2012, in Indonesian). Study on Strategies for Increasing the Safty Safety of Traditional Ships. *Warta Penelitian Perhubungan, 24*(3), 218-231.

Mitrani, A., Daziel, M.,& Fitt, D. (1992). *Competency Based Human Resource Management: Value-Driven Strategies for Recruitmen, Development and Reward*. kogan Page Limited: London.

Mujiatun, S. (2015, In Indonesian). The Influence of Training and Work Motivation on Employee Competence at Regional Office VI of the Medan State Civil Service Agency. *Jurnal Ilmiah Manajemen dan Bisnis, 15*(1), 48-60. DOI: http://dx.doi.org/10.30596%2Fjimb.v15i1.966

Mulyono, T., & Meilani, R.I. (2016, in Indonesian). The Impact of Training Program on Employees' Competency Levels. *Jurnal Pendidikan Manajemen Perkantoran, 1*(1), 167-175.

Munawar, A. (2007, in Indonesian). *Sustainable Transportation Development*. Pidato Pengukuhan Guru Besar Fakultas Teknik UGM, Yogyakarta.

Nawawi, H.H. (2001, in Indonesian). Human Resource Management. Gajah Mada University Press, Yogyakarta.

Spencer, L.M., & Spencer, S.M. (1993). *Competence at Work: Models For Superior Performance*, John Wiley & Son Inc.

Tristanto, D. (2005, in Indonesian). The Influence of Competence and Compensation on Supervisor Performance at CV Parang Tresno in Surabaya. Skripsi Tesis, Universitas Airlangga.

Wijayanto, J., & Dotulong, L.O.H. (2017, in Indonesian). The Effect Of Training Competency And Motivation To Employee Performance At Pt. Plasa Multi Krindo Manado. Jurnal EMBA, 5 (2), 3048-3057. DOI: https://doi.org/10.35794/emba.v5i3.17350

Wursanto, I.G. (2003, in Indonesian). Personnel Management 1. Penerbit Kanisius, Yogyakarta.

Yunidasari, R., Irfani, A., & Assyofa, A.R. (2020). Effect of Training and Competence on Employee performance. *Prosiding Manajemen, 6*(2), 970-975. DOI: http://dx.doi.org/10.29313/.v6i2.24129