

HOW DOES THE PASSENGER PERCEPTION AWARE TO THE SAFETY ASPECTS IN CASE ON PASSENGER SHIP ?

Antoni Arif Priadi^{1*}, **Imam Fachrudin**^{2**}, **Lili Purnamasita**^{3***},
Retno Sawitri Wulandari^{4****}, and **Vidya Selasdini**^{5*****}

¹ Department of Nautical Studies, Sekolah Tinggi Ilmu Pelayaran Jakarta, Indonesia
Jl. Marunda Makmur, Cilincing, Jakarta-Utara, Indonesia

*Email : antoni.pip.smg@gmail.com

Phone : +21-88991618; Fax : +21-44834345

² Department of Marine Engineering, Sekolah Tinggi Ilmu Pelayaran Jakarta, Indonesia

**Email: imam_fahcruddin@dephub.go.id

³ Department of Port and Shipping , Sekolah Tinggi Ilmu Pelayaran Jakarta, Indonesia

***Email: lili.purnamasita@gmail.com

⁴ Department of Marine Engineering, Sekolah Tinggi Ilmu Pelayaran Jakarta, Indonesia

****Email: retno_sawitri@dephub.go.id

⁵ Department of Port and Shipping, Sekolah Tinggi Ilmu Pelayaran Jakarta, Indonesia

*****Email: selasdini.vidya@gmail.com

ABSTRACT

The numbers of ship accident which had occurred at passenger ship in 2013 to 2017 still remaining a question to the passenger on how they aware of the safety aspects during voyage. The passenger on board is one of the factors considered for the successful mitigation during in emergency situation. Therefore, the passenger at certain level needs to familiarize the safety aspects on passenger ship. The aim of this research is to analyze the gap between perception and expectation of the passenger ship based on safety aspects by using gap analysis method. The survey through questionnaire was conducted for 105 passengers of passenger ship at Tanjung Priok Terminal, Jakarta. The result indicated that there was gap for all variables under first category group. The gap was also found under second and third category group. Furthermore, the result gives the important consideration for developing approaches to prevent accident that focus on the operative ways dealing with the safety aspects awareness of the passenger ship.

Keywords: safety, passenger ship, gap analysis, accident.

INTRODUCTION

Two days after the ferry they were on sank after colliding with a cargo ship, 82 people remained unaccounted for Sunday in waters, 38 peoples dead and rescued another 750 passengers. The passenger ship MV St. Thomas Aquinas collided with cargo ship the Sulpicio in the Mactan Channel about 2 miles northwest of Cebu City, the capital of Cebu province in August 2013. (edition.cnn.com, 2013). Other ship accident, the ferry collided with a cargo vessel and sank within minutes on the Padma river, the second deadly boat accident in a fortnight in the country, which has a history of ferry tragedies at February 2015. The ferry MV Mostofa was overcrowded with about 70-150 passengers sank in a Bangladesh river leaving at least 41 people including 11 children dead as rescuers searched for missing passengers. (www.ndtv.com, 2015).

The similar accident occurred in April 2014 at South Korean vessel. The Sewol vessel was carried 476 persons when it was capsized off the southwestern island of Jindo. (Dailymail.co.uk 2016). The victims is 304 loss of lives and of those, 250 were student.. (Dailymail.co.uk 2016). The victims is 304 loss of lives and of those, 250 were student. In Januari 2017, the KM Zahro Express ferry carried over 200 passengers, caught fire during its way to Tidung Island, Thousand Islands. The National Disaster Mitigation Agency (BNPB) reported 23 passengers were killed while 17 peoples suffered injuries. It further said 194 passengers survived the incident while 17 others were reported still missing. (The Jakarta Post, 2017). The Police already stated that the Master of KM Zahro Express as a suspect being considered to meet two elements of evidence , such as the ship's safety equipment and the responsibility on safety, security and the property of vessel, seafarer & cargo. Later on, KM. Mutiara Sentosa I which also caught fire in Masalembu Island in May 2017, caused 5 peoples died. (CNN Indonesia, 2017). Result of the investigation from the KNKT said that the fire came from the lower deck from the truck. There were also differences from the numbers on the manifest to the number of peoples evacuated. (Nasional.tempo.co, 2017).

The facts that have been found from the above ship accident is the number of dead passenger or missing passenger. Rather we may say that the risk of accident on passenger or ferry ship causes some critical question to the passengers. The question raised is why there was big number of passengers was found missing? Did they really aware of the safety aspect during voyage? Did the passengers have sufficient understanding on how to abandon the ship in case of emergency? Did they have sufficient time to escape from the ship? Those questions lead to do the research, the questions which need to be answered through this research. The objective of this research is to analyze the safety knowledge of the passenger during voyage by using gap analysis method.

RESEARCH METHODOLOGY

To start with the research methodology, the term of safety need to be clarified in the beginning. The safety is a human perceived quality that determines to what extend the management, engineering and operation of a system is free of danger to life, property and the environment,” (Kuo, 2007). It means that the underlined words of free of danger to life become the key aspect regarding safety. Another definition, safety is “the state of not being exposed to danger, a protective device (as on a weapon) to prevent accidental operation”. (Merriam-webster.com, n.d.). Based on those definitions, safety is really related to the perception of human towards a thing. For instance, related to the voyage on board ship, the human will behave a safety matter regarding their perception towards safety on board ship.

A research related to the safety perception showed that even though the overall safety knowledge of the passengers can be stated as good, but there are some differences between groups of passengers. (Hystad, Olaniyan, & Eid, 2016). Younger passengers and passengers on shorter trips generally have less safety knowledge than older passengers and passengers on longer trips. Their study also concluded the effects of two different formats on presenting safety relevant information due to passengers' perception of trust, safety and risk on board. Another research identified five safety perception themes. (Ahola et al., 2014). The results specify that passenger's perception

safety through the architecture of the passenger ship, the life-saving appliances, communications, emotions and other people. It could be stated that the safety research on passenger ship design, where human perceptions and reactions to the surrounding environment significantly affect their behavior.

The detail of the research methodology is presented where the research is started from the literature review followed by collecting data through the questionnaire survey. The collected data then treats with validity and reliability statistic test. Finally, the gap analysis is applied to the means of perception and expectation among respondent.

The questionnaire survey consists of the questions of general information of the respondent. Then, the questions asked respondents to rate the level of perception and expectation of each variable. To extract the level of perception, the respondents were asked to rate each variable on the five – point using likert scale, varying from “strongly disagree” (1) to “strongly agree” (5). Whereas for the level of expectation, the five – point using likert scale is used, varying form “strongly unnecessary” (1) to “strongly necessary” (5).

A questionnaire survey was designed into three categories. The first category is related to the safety aspect during on board ship which consists of 16 variables as indicated on the table 1. The variable 1 to variable 10 regards to the general safety on board ship. Followed by variable 11 to variable 13 that related to the live saving equipment and the variable 14 to variable 16 relates to the fire extinguisher. The questionnaire is based on the practical safety on board and the requirements of International Convention on Safety of Live at Sea (SOLAS) 1974. The questionnaire items as they are treated as the variables emphasis on the general safety aspects on board ship, live saving equipment for sea survival and fire extinguisher for fighting fire.

Table 1. The Variables Under First Group Categories.

Variable	DESCRIPTION OF VARIABLE
V1	The ticket is appropriately checked
V2	The luggage is appropriately checked
V3	The sign to passenger room is clearly visible
V4	The sign direction for muster station is clearly visible
V5	I recognize the muster station clearly
V6	The alarm of summoning passenger is clearly identified
V7	The public addressor is heard clearly
V8	The guidance for surviving in the emergency is clearly understood
V9	Evacuation information is given by crew properly
V10	Identity of crew is easily identified
V11	Life jacket location is identified and nearby me
V12	The guidance of using lifejacket is easily understood
V13	The use of lifejacket is informed by crew
V14	Fire extinguisher is identified and nearby me
V15	The guidance of using fire extinguisher is easily understood
V16	The use of fire extinguisher is informed by crew

The second category of questionnaire survey consists of 9 variables which related to the knowledge of passengers before and after having safety demo identified with VC

symbols. The variables asked the knowledge of the passenger in case the emergency situation will occur. The detail of variables is arranged as follows:

1. VC1 (In emergency situation do you know where is route);
2. VC2 (In emergency situation do you know what is alarm signal);
3. VC3 (In emergency situation do you know how to take lifejacket);
4. VC4 (In emergency situation do you know how to take lifebuoy);
5. VC5 (In emergency situation do you know how to use lifejacket);
6. VC6 (In emergency situation do you know how to use lifebuoy);
7. VC7 (In emergency situation do you know how to find first aid);
8. VC8 (In emergency situation do you know how to find alarm button);
9. VC9 (In emergency situation do you know where is route).

The last category of the questionnaire survey is related to the trust of the passenger during voyage to the safety of ship. The variables consist of four questions due to the trust of the passenger to accidents such as collision (VD1), fire (VD2), sinking (VD3), and emergency situation (VD4).

A questionnaire is stated valid if the question of the questionnaire could explore things which will be measured by such questionnaire. Validity test in this research use construct validity. The construct validity test result is calculated using Pearson Product Moment formula so that "r" is calculated and then compared with "r" table. If the resulting r arithmetic is greater than or equal to "r" table (0.19) at a significant level of 5% then the instrument of this study meets the validity criteria or is said to be valid. Further, a questionnaire's of reliability was verified by using Cronbach's alpha coefficient (α), which is a measurement of internal consistency. This reliability test requested to complete a final questionnaire. A total of 105 respondents were elaborate in the reliability test. To find α , the Statistical Package for Social Sciences (SPSS) software program version 18 was used to analyze raw data. High reliability measurement means that it is able to provide reliable result. A questionnaire items said reliable if the answer of respondent to the questionnaire is consistent. To determine the coefficient of reliability, the Cronbach's Alpha is applied. If the value of Cronbach's Alpha is more than 0.60, it means that the variable is reliable (Sunnyoto, 2009).

The survey was conducted at passenger terminal of Tanjung Priok, Port of Jakarta during June to July 2017. Several manners were used to motivate the questionnaires to the respondents. Nevertheless, to motivate the respondents to participate in the survey, face to face or direct delivery was preferred. Doing so improved the response rate. Gap analysis is used to determine the steps which are need to be taken for further movement from recent condition to the expected condition in the future. The gap analysis is also a means of comparison between actual performance and future performance. This gap analysis also identifies the actions plan to achieve the future performance. (Suroto, 2015). Furthermore, the gap analysis method is used to analysis between the perception and expectation of passenger towards the safety aspect during voyage on board ship. The analysis used descriptive statistic through the calculation of the pair of perception and expectation each of variables using the equation 1.

$$\bar{x} = \frac{x_1 + x_2 + \dots + x_n}{n} = \frac{\sum_{i=1}^n x_i}{n} \quad (1)$$

Note:

\bar{x} = Mean score of variable

x = Score of responden for variable

n = Number of observation

The gap calculation is obtained from the mean score of expectation after deducted with mean score of perception. The gap equation can be found at equation 2.

$$\text{Gap} = \text{Mean score of expectation} - \text{Mean score of perception} \quad (2)$$

Finally, the gap analysis method is implemented for three categories of variables groups, consist of the category of the perception and expectation of the safety matters, the category of when the emergency situation occur, and the category of the trust of passenger toward safe voyage on board ship.

RESULTS AND DISCUSSION

The respondent profiles include the respondent's age, education background, employment status and travelling number by ship. The total number of respondents was 105 passengers. For the respondent age, there are 61 % of passengers have age less than 31 years old, followed by 38% of passengers have middle age between 31 – 50 years old and small percentage for passenger's age more than 51 years old. Regarding to the educational background, there are 50% passengers graduated from senior high school and 40% graduated from higher education. Then 10% of respondents is categorized with other education background. Other profiles, regarding to the employment status, 61% of passenger worked for private sector and 11% worked as civil servant, and 15 % of respondent are students. To the last respondent profile, the travelling number on the same route, the 65% of passengers have previous experience between once and three times. Meanwhile, those who has 4 to 6 times, are only 26% passengers accounted and 5% respondents have experienced 7 to 9 times of travelling time.

In relation to the validity test of first category group variable, it was found that validity for 16 variables under perception are higher than the 'r' from table as well as the expectation variables. For instance, presented in table 2, the variable V1 related to the properly check of passenger ticket has value 0,521 and it was greater than 'r' from table (0.19). The same procedure was applied for 16 variables under the perception and expectation score. The notation of star means that there is correlation for these question. The overall validity test for 16 variables was found that all variables were valid. The same procedures were applied to the second and third category group of variables. They were found that the variables were also valid.

Table 2. Validity Test Result for Perception Measurement.

		Pcheckticket	Pcheckluggage	Pdirection to passenger space	Ptotal
Pcheckticket	Pearson Correlation	1	,368**	,179	,521**
	Sig. (2-tailed)		,000	,070	,000
	N	105	105	103	105
Pcheckluggage	Pearson Correlation	,368**	1	,312**	,473**
	Sig. (2-tailed)	,000		,001	,000
	N	105	105	103	105
	Sig. (2-tailed)	,003	,062	,003	,000
	N	105	105	103	105
Pcrew inform use ff app	Pearson Correlation	,290**	,352**	,352**	,634**
	Sig. (2-tailed)	,003	,000	,000	,000
	N	105	105	103	105
Ptotal	Pearson Correlation	,521**	,473**	,637**	1
	Sig. (2-tailed)	,000	,000	,000	
	N	105	105	103	105

Following, the reliability test is implemented for the perception and expectation of the passengers of ship. The result showed that the value of Pearson Correlation Ptoganjil was 0,762** against Ptogenap (table 3). It means that the variables on the questionnaire have good correlation and it can be used for further analysis. The table 3 is the result of the reliability test for the variables of perception. The similar procedures were also applied for the variables of expectation and they were found that the all variables were reliable. The same procedures were applied to the second and third category group of variables. They were found reliable, too.

Table 3. Reliability Test Result for Perception Measurement

		Ptoganjil	Ptogenap
Ptoganjil	Pearson Correlation	1	,762**
	Sig. (2-tailed)		,000
	N	105	105
Ptogenap	Pearson Correlation	,762**	1
	Sig. (2-tailed)	,000	
	N	105	105
**. Correlation is significant at the 0.01 level (2-tailed).			

The gap analysis for the 16 variables categorized under first group is displayed on the figure 1. The results showed that all respondents rate the variable 2 (check the luggage) as the most important gap, followed by variable 1 (check passenger ticket in detail), variable 9 (Evacuation information is given by crew properly). Meanwhile, there are 8 variables have medium value of gap which includes:

1. V13 (The use of lifejacket is informed by crew);
2. V4 (The sign direction for muster station is clearly visible);
3. V15 (The guidance of using fire extinguisher is easily understood);
4. V11 (Life jacket location is identified and nearby me);
5. V8 (The guidance for surviving in the emergency is clearly understood);

6. V10 (Identity of crew is easily identified);
7. V12 (The guidance of using lifejacket is easily understood);
8. V3 (The sign to passenger room is clearly visible).

Further, 5 variables have the lower gap such as:

1. V5 (I recognize the muster station clearly);
2. V7 (The public addressor is heard clearly);
3. V6 (The alarm of summoning passenger is clearly identified);
4. V16 (The use of fire extinguisher is informed by crew).
5. V14 (Fire extinguisher is identified and nearby me).

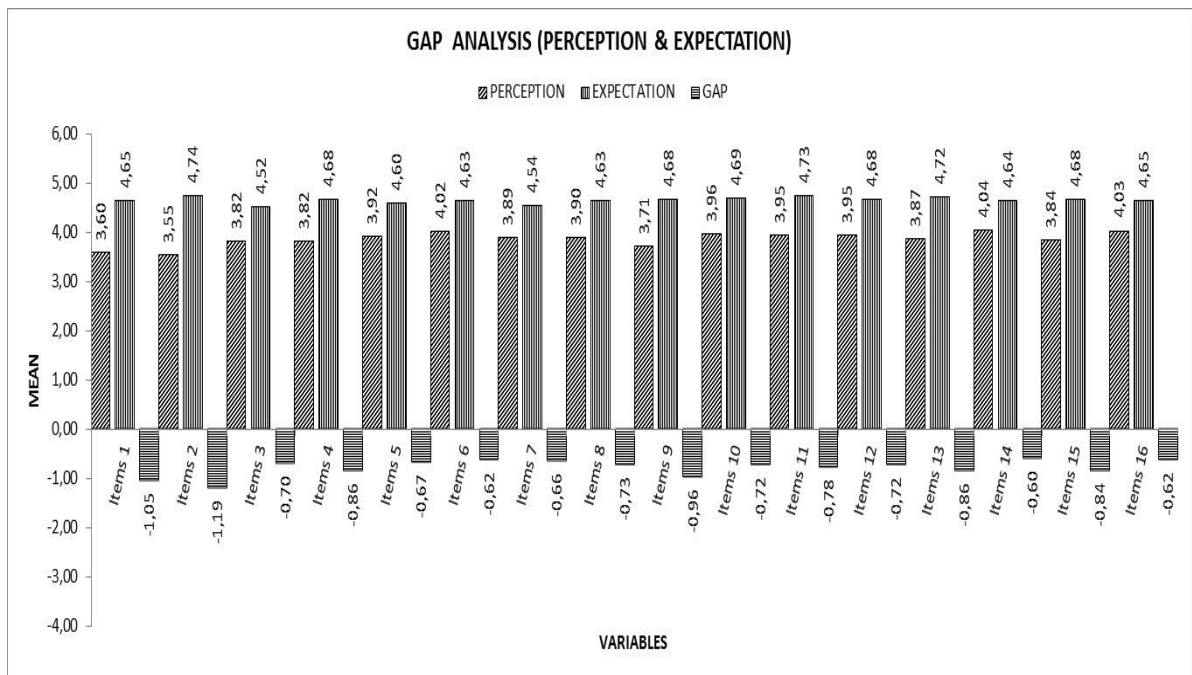


Figure 1. gap analysis for first group category.

Having the gap analysis result of the first category of the variables group, then the similar procedures were implemented to obtain the gap analysis of the second category of the variables group. The second category consists of 9 variables from VC1 to VC9. The gap analysis for the second category is presented in figure 2.

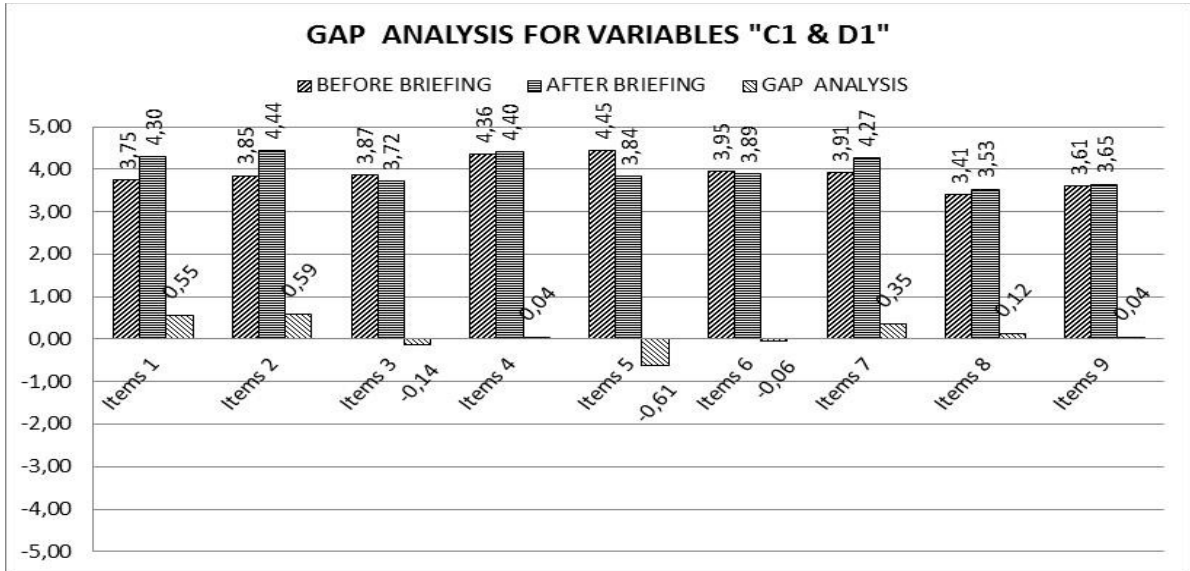


Figure 2. gap analysis of second group category.

From the figure 2, it could be stated that there were positive value after having briefing on the safety matter. However, the attention needs to be put on the gap for the variable 5, 3 and variable 6. The variable 5 is regarding the question in case of emergency, do they know how to use lifejacket, in this case the effort should be made by the crews to give the passenger an opportunity to practice on wearing life jackets. The efforts also need to show the location of the life jacket instead of the demo. The variable 6 was describing the use of lifebuoy which it may not all passengers know what is lifebuoy and how to use it. The crew at least is advised to demonstrate how to use lifebuoy in front of the passengers.

Furthermore, the result of third category of variables group which is consisted of 4 variables is also treated in the similar manner with the first and second group. The gap analysis is presented in figure 3.

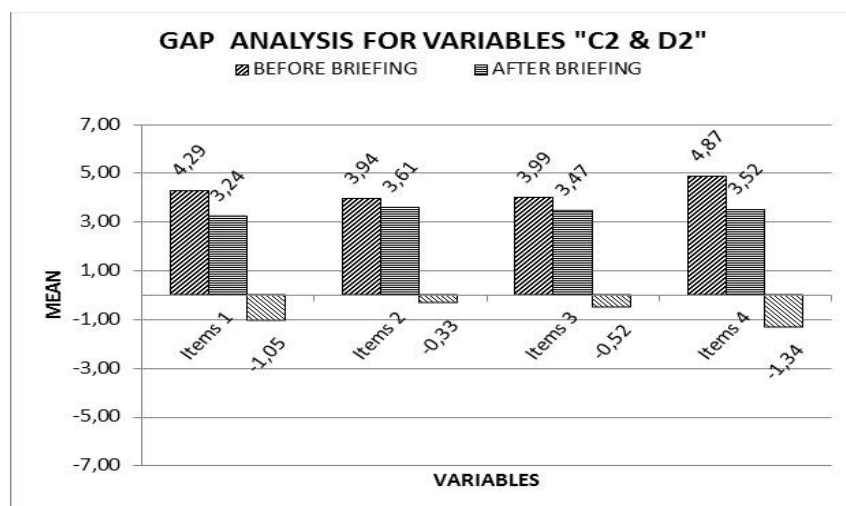


Figure 3. gap analysis of third group category.

Based on the figure 3, it can be concluded that there were gap on the trust of the passenger to the emergency situation during on board the ship. They were not confidence at all that the ship will arrive at the destination. The effort should be made

to motivate the crew to do safety matter during on board the ship and to avoid panic during emergency situation. By to do so, they will have more confidence during voyage.

CONCLUSION

Safety continues to be one of the major problems in the shipping industry. To achieve better safety performance, emphasis has been placed on implementing effective safety familiarization for the passenger. As the preliminary identification, they have less survive when ship accident occur. Therefore, this study was conducted to identify the critical areas of safety familiarization program implementation that the shipping company through the master and crew as well as the harbor master must recognize in order to make continuous improvements.

This study identified 16 factors under first category that contribute to the safety aspects during on board the ship and then evaluated their degrees of importance and actual status based upon the respondents' perceptions. The results of this study showed that all respondents rate the variable 2 (check the luggage) as the most important gap, followed by variable 1 (check passenger ticket in detail), variable 9 (Evacuation information is given by crew properly). The rest of variable have a gap under the third variables mentioned here. In light of this research, gap analysis was carried out to determine how to improve safety programs. This analysis suggested that larger gaps between degree of expectation and actual status of success indicate more unsatisfactory practices. Thus, correcting the factors which have large gaps must be emphasized more strongly. Three priority factors under the first category of safety aspects should be given more attention in order to achieve a satisfactory level. Meanwhile, the other variables showed satisfactory practices as characterized by very small gaps.

Then under second category of 9 variables related to the safety awareness after and before having demonstration or video is found that variables 5 (In emergency situation do you know how to use lifejacket) as the most important gap followed by variable 3 (In emergency situation do you know how to take lifejacket) and variable 6 (In emergency situation do you know how to use lifebuoy). Thus, adjusting the variable which have large gaps must be highlighted more strongly. These point should be born in mind that the crew really should ensure the passenger understand how to use lifejacket, how to take lifejacket and how to use the lifebuoy. Regarding passenger trust to the crew, the trust for the emergency situation will occur on board during voyage has the most gap followed by the risk of collision, fire and sinking. Therefore, the safety information should become the first priority to ensure that the passenger feel safe during voyage.

The shipping company, master on board, crews of the ship as well as the harbor master need to carry the safety aspect familiarization whether on board the ship or while the passengers in the waiting room. The authors advise that the familiarization of the safety aspect during at the passenger room will have more impact rather than on board due to the availability of time. The familiarization should present the risk of the ship accident as well as the consequences if the fail to follow the safety procedures.

ACKNOWLEDGEMENTS

The authors would like to be obliged to Sekolah Tinggi Ilmu Pelayaran Jakarta for providing the opportunity to conduct this research.

REFERENCES

- Ahola, Markus, Pekka, M., Pentti, K., and Juhani, P. (2014). Perceiving safety in passenger ships – User studies in an authentic environment. *Safety Science*, 70, 222–232.
- Aksorn, T. & Hadikusumo, B.H.W.(2007). Gap Analysis Approach for Construction Safety Program Improvement. *Journal of Construction in Developing Countries*, Vol. 12, No. 1, Universiti Sains Malaysia.
- CNN Indonesia. (2017). penumpang-km-mutiara-sentosa-1-sudah-dieykuasi. www.cnnindonesia.com. Retrieved June 10, 2017 from www.cnnindonesia.com/nasional/20170520094349-20-216076/penumpang-km-mutiara-sentosa-1-sudah-dieykuasi/.
- Dailymail.co.uk. (2016). <http://www.dailymail.co.uk>. Eerie-pictures-untouched-classroom-belonging-students-teachers-killed-Sewol-ferry-disaster-South-Korea. Retrieved June 10, 2017 from <http://www.dailymail.co.uk/news/article-3605976/Eerie-pictures-untouched-classroom-belonging-students-teachers-killed-Sewol-ferry-disaster-South-Korea.html>.
- Edition.cnn.com. (2013). Philippines ships collision. Retrieved June 10, 2017 from <http://edition.cnn.com/2013/08/16/world/asia/philippines-ships-collision/index.html>.
- Hystad, S.W., Oyeniyi S.O., and Jarle, E. (2016). Safe travel: Passenger assessment of trust and safety during seafaring. *Transportation Research Part F*, 38, pp. 29–36.
- Kuo, C. (2007). Safety Management and Its Maritime Application. London: The Nautical Institute.
- Merriam-webster.com. (n.d). safety. www.merriam-webster.com/thesaurus. Retrieved June 10, 2017 (<http://www.merriam-webster.com/thesaurus/safety>).
- Nasional.tempo.co. (2017). www.nasional.tempo.co. km-mutiara-sentosa-i-terbakar-knkt-selidiki-truck-sumber-api. Retrieved June 10, 2017 from www.nasional.tempo.co/read/news/2017/05/21/058877324/km-mutiara-sentosa-i-terbakar-knkt-selidiki-truck-sumber-api.
- Ndtv.com. (2015). 41 dead as bangladesh ferry sink. Retrieved June 10 2017 from <https://www.ndtv.com/world-news/41-dead-as-bangladesh-ferry-sinks-search-for-missing-countinues-741533>.
- Sujarweni, V. W. (2015). SPSS Untuk Penelitian. Yogyakarta: Pustaka Baru.
- Sekaran, U. (2006). Metodologi Penelitian untuk Bisnis. Jakarta: Salemba Empat.
- Sunyoto, D. (2009). Analisis Regresi dan Uji Hipotesis. Yogyakarta: Media Pressindo.
- Suroto, A. (2015). Gap Analysis. <http://sis.binus.ac.id>. Retrieved June 10, 2017 (<http://sis.binus.ac.id/2015/07/28/gap-analysis-analisa-kesenjangan/>).
- The Jakarta Post. (2017). ministry-to-standardize-thousand-islands-service-after-zahro-express-incident.” thejakartapost.com. Retrieved June 10, 2017 (www.thejakartapost.com/news/2017/01/02/ministry-to-standardize-thousand-islands-service-after-zahro-express-incident.html).
- Wijaya, T. (2011). Manajemen Kualitas Jasa. Jakarta: PT. Indeks.