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CAPTURING CADETS' SELF-EFFICACY TO PROMOTE SAFE FUTURE OF SEAFARER

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Abstract. Human error that causes accidents is one of the most significant concerns of maritime sectors. In fact, most accidents happen mainly due to human error, therefore good decision making is needed. In facing problem, one of the important skills is self-efficacy. The purpose of the article is to explore ways to improve self-efficacy in order to ensure a safe future for seafarers. Cadets should have great self-efficacy in order to make future seafaring safely (even in unexpected condition). This study reports the cadets' self-efficacy at Collision Prevention regulations on Sea and Guard Service course. The data was taken quantitatively. 142 cadets of the deck department were asked to respond Generalized Self Efficacy questionnaire (GSE). This investigation points out that cadets' self-efficacy is greater than the international average of GSE. However, cadets need to develop creative thinking skill in dealing with unexpected condition or someone who opposes in gaining their goal. These findings suggest that self-efficacy should be integrated into classroom learning. For the next research instructional design can be developed to improve self-efficacy skill effectively and efficiently.

Keywords: self-efficacy, cadets, safe seafaring
JEL Classification: J20, J28

INTRODUCTION

Human error that causes accidents is one of the most significant concerns of maritime sectors. In fact, most accidents happen mainly due to human error, therefore good decision making are needed. In facing problem, one of the important skills is self-efficacy. Decision-making self-efficacy would significantly influence decisions with regard to speed and accuracy after controlling for past performances. Self-efficacy was a significant constant predictor of decision-making speed and self-efficacy was beyond the influence of past performance (Hepler and Feltz, 2012). Cadets

should have great self-efficacy in order to make future seafaring safely (even in unexpected condition). This study reports the cars' self-efficacy at Collision Prevention Regulations on Sea and Guard Service course. Officers on watch must first be able to perceive the condition of all the vessels around them, the relationship of their vessel to any hazards, their vessel's operational condition, and the comprehension of those perceptions and executions of actions to avoid the hazard or collision.

LITERATURE REVIEW

a. Self-Efficacy and Decision Making

Inadequate communication, poor judgment and decision making, inefficient task management, and absence of leadership have all been identified as causal factors in air transport accidents (Helmreich, Merritt, and Wilhelm, 1999). Problem solving and decision making are treated together because in the cockpit decision making frequently is embedded in a broader process of problem solving. Before a decision can be made, the crew must first recognize that a problem exists, determine its nature and define the desired outcome.

Current theories with both heuristic and naturalistic decision making as well as intuition all depend on experienced decision makers (Azuma, Daily, and Furmanski, 2006; Dane, Rockmann, and Pratt, 2012; Hall, 2010; G. Klein, 2008; G. A. Klein, Calderwood, and MacGregor, 1989; M. Klein, 1998; Randel, Pugh, and Reed, 1996). According to Bandura, self-efficacy is the key to personal change and resource development. Efficacy has an impact on cognitive, affective, motivational, and decision-making processes. Self-efficacy determines whether an individual will think optimistically or pessimistically in self-enhancing or debilitating ways (Bandura, 2006)

Feltz and Hepler (Hepler and Feltz, 2012) examined the relationship between self-efficacy and decision-making speed and accuracy on a simulated sport task. Their study was based on the previous research that supported the link between self-efficacy and physical performance in sports. They predicted that decision-making self-efficacy would significantly influence decisions with regard to speed and accuracy after controlling for past performances. Their findings concluded that self-efficacy was a significant constant predictor of decision-making speed and that self-efficacy was beyond the influence of past performance (Hepler and Feltz, 2012).

In other words, it takes longer for participants with low self-efficacy to make their decisions than feel confident in their decision-making capabilities (Hepler and Feltz, 2012). Lin (2006) researched the decision-making process of senior officers when maneuvering the ship and whether or not they obeyed the rules of the regulations, and what the reasons for navigational faults were. He wanted to know why a ship officer's behavior contravenes the regulations, resulting in a collision. The maritime goal is to stay out of the way of an approaching ship as far as possible. Therefore, if there are any failures by human actions or ship's equipment, the possibility of a collision increases significantly due to late avoiding action (Bin, 2006).

b. Collision Prevention Regulations on Sea and Guard Service

New junior officers should have been taught situation awareness in their watch keeping classes. However, situation awareness is a process that, according to Grech et al. (2008), involves a feedback loop with a sequence of perception, comprehension, and execution that drives the feedback loop. Officers on watch must first be able to perceive the condition of all the vessels around them, the relationship of their vessel to any hazards, their vessel's operational condition, and the comprehension of those perceptions and executions of actions to avoid the hazard or collision. This process is an ongoing cycle of reassessing the situation and the environment. New officers may not have the experience to recognize and react to a developing situation in a timely manner.

Recognizing shortcomings in human behavior and applying them to new or revised educational techniques may assist in reducing the high incidence of marine casualties (Emad and Roth, 2008; Goulielmos, Lathouraki, and Giziakis, 2012; Jordanoaia, 2010; Wang and Zhang, 2000).

c. Self-efficacy and seafarer

Organizational culture and self-efficacy were identified as factors affecting the quality of work life, while organizational support was found to have an indirect effect through self- efficacy and perceived fatigue. The final model accounts for 63.1% of the variance in seafarers' quality of life. As such, this study shows that self-efficacy is important for the quality of life of seafarers, having both direct and indirect effects. Moreover, organizational support may prove to be the primary intervention point for relieving received fatigue and enhancing self-efficacy, thus improving the quality of work life (Kim, J.-H. and Jang, S.-N., 2018).

Meanwhile, the diverse and rapid changes to the natural environment while at sea make it difficult to maintain physical homeostasis (Jezewska, Grubman Nowak, and Mory's, n.d.). Seafarers thus endure a highly stressful work environment and a significant degree of fatigue relative to other areas of employment. The accumulated stress and fatigue have a direct negative effect on seafarers' health that may threaten both their own safety and that of their colleagues, and lead to operational accidents.

Considering the unique nature of maritime occupations, in which seafarers are required to operate efficiently in the ship's socially-isolated environment and successfully perform tasks to increase subjective satisfaction, it can be argued that maintaining self-efficacy is essential. Increasing internal job satisfaction and positive self-management by raising seafarers' self-efficacy will enable long-term efficiency in organizing and managing the maritime industry.

Second, seafarers' self-efficacy, which corresponds to the behaviors of the maritime industry's management systems, was found to have a negative impact on perceived fatigue, indicative of the health of seafarers, but found to have a positive effect on their quality of work life. The negative effect on perceived fatigue implies that higher self- efficacy in seafarers leads to lower perceived fatigue and higher job enjoyment. It seems likely that maritime enterprises are in need of support and planning to improve the self-efficacy of their employees.

Maritime industry executives need to strengthen appropriate organizational support by increasing encouragement and compensation in the organizational dimension to elevate the self-efficacy of seafarers, as well as through cementing and enhancing the organizational support perceived by seafarers. Further research is needed to construct a viable plan for positively reinforcing the management systems in terms of the developmental, rational, hierarchical, and group categories — that is, the sub-elements of the seafarers' organizational culture.

d. GSE and Self Efficacy

The GSE score reflected whether or not an individual had good self-efficacy. Self-efficacy refers to a person's belief that s/he is capable of successfully completing a task in a designed environment (Bandura, 1986). Bandura (1982) noted that perceived self-efficacy asks individuals to judge whether or not they are capable of performing specific tasks rather than if they actually perform the task. Thus, self-efficacy refers to capability judgments, not expected outcomes. Mastery experience, vicarious experience, social and communicative persuasion, and physiological arousal are sources self-efficacy.

The previous research has pointed out that students with high self-efficacy work harder, pursue more challenging goals, and are more persistent when they encounter difficulties (Pajares, 2003). Students with high self-efficacy can better monitor and self-regulate their efforts and more effectively use their cognitive strategies for time management and learning as compared to students

with lower self-efficacy, and this adds to higher academic performance (Chemers, Hu, and Garcia, 2001; Komarraju and Nadler, 2013). Barry and Finney (2009) asserted that individuals with lower levels of self-efficacy experience more stress and anxiety, and lower motivation compared to individuals with higher self-efficacy. Similarly, having conducted a longitudinal study, Wei, Russell and Zakalik (Wei, Russell, and Zakalik, 2005) found that the social self-efficacy of university students is a mediator between feelings of loneliness and subsequent depression.

PAPER OBJECTIVE

The purpose of the article is to explore ways to improve self-efficacy in order to ensure a safe future for seafarers and to report the cadets' self-efficacy at Collision Prevention Regulations on Sea and Guard Service course.

METHODOLOGY

This study reports the cadets' self-efficacy at Collision Prevention Regulations on Sea and Guard Service course. The data was taken quantitatively. Table 1 describes the map of respondents which are from Mandiri, Formation, and Regular class of Diploma-3 Deck Department in Surabaya Merchant Marine Polytechnic.

Table 1

Respondents of the research

No	Program	Year	Term	Class	Qty	Total
1.	D3 Mandiri	V – 2017	lV	DECK – A	2	**67 Cadets**
2.	D3 Mandiri	V – 2017	lV	DECK – B	23	
3.	D3 Mandiri	V – 2017	lV	DECK – C	23	
4.	D3 Formation	lXA – 2018	Ill	DECK – A	26	**26 Cadets**
5.	D3 Regular	V – 2017	lV	DECK – A	25	**49 Cadets**
6.	D3 Regular	V – 2017	lV	DECK – A	24	
	Total of all respondents					**142 Cadets**

Source: Own compilation

142 cadets who are taking courses of Collision Prevention Regulations on Sea and Guard Service were asked to respond Generalized Self Efficacy questionnaire (GSE). There are 10 questions in GSE that are correlated to emotion, optimism, and work satisfaction. The total score is calculated by finding the sum of the all items. For the GSE, the total score ranges between 10 and 40, with a high score indicating more self-efficacy. Table 2 shows the GSE questions which are adopted from Schwarzer, R., and Jerusalem, M. (1995).

Table 2

Generalized elf Efficacy questionnaire (GSE)

No	Statement	Not at all true	Hardly true	Moderately true	Exactly true
1	I can always manage to solve difficult problems if I try hard enough	☐	☐	☐	☐
2	If someone opposes me, I can find the means and ways to get what I want.	☐	☐	☐	☐
3	It is easy for me to stick to my aims and accomplish my goals.	☐	☐	☐	☐
4	I am confident that I could deal efficiently with unexpected events.	☐	☐	☐	☐
5	Thanks to my resourcefulness, I know how to handle unforeseen situations.	☐	☐	☐	☐
6	I can solve most problems if I invest the necessary effort	☐	☐	☐	☐
7	I can remain calm when facing difficulties because I can rely on my coping abilities.	☐	☐	☐	☐
8	When I am confronted with a problem, I can usually find several solutions.	☐	☐	☐	☐
9	lf 1 am in trouble, I can usually think of a solution	☐	☐	☐	☐
10	I can usually handle whatever comes my way.	☐	☐	☐	☐

Source: Own compilation

RESULTS AND DISCUSSION

From table 3 there can be seen every average of GSE scale for each class and each question. Horizontally, it can be read the average GSE scale for each class: II Deck A FORM (31.33), II Deck B FORM (31.75), II Deck C FORM (32.17), IV Deck A MANDIRI (30.67), IV Deck B MANDlRI (33.65), IV Deck C MANDIRI (32.43), IV Deck A REG (31.76), IV Deck B REG (30.46). The average for all class is 31.78. Vertically, it can be read GSE scale for each question: average question 1 (3.34), average question 2 (3.14), average question 3 (3.17), average question 4 (3.01), average question5 (3.35), average question 6 (3.4), average question 7 (3.13), average question 8 (3.19), average question 9 (3.12), average question10 (2.93).

Purba, D., Hasugian, S., Harini, N. V. and Zuhri, Z. (2020), "Capturing cadets' self-efficacy to promote safe future of seafarer", *Management and entrepreneurship: trends of development*, Volume 3, Issue 13, pp. 24-34, available at: https://doi.org/10.26661/2522-1566/2020-3/13-03

Table 3

Average GSE scale of cadets

CLASS	Q1	AV Q2	AV Q3	AV Q4	AV QS	AV Q6	AV Q7	AV Q8	AV Q9	AV Q10	AVof Class
11 Deck—A FORM	3.37	3.08	3	2.88	3.38	3.38	2.96	3.13	3.08	3.08	31.33
11 Deck—B FORM	3.46	2.92	3.17	3.17	3.42	3. 58	3.04	3.13	3.21	2.67	31.75
11 Deck—C FORM	3. 54	3.08	3.17	3.04	3. 5	3.46	3.17	3.29	3.17	2.75	32.17
lVDeck—A MAND1R1	3.29	3.19	3.14	2.81	3.1	3.29	3	3.19	2.86	2.81	30.67
lVDeck—B MAND1R1	3.35	3.30	3.26	3.04	3.61	3. 52	3.43	3.30	3.48	3.35	33.65
lVDeck—C MAND1R1	3.30	3.22	3.30	3.17	3.39	3.30	3.35	3.17	3.04	3.17	32.43
lV Deck—A REG	3.32	3.24	3.2	3.12	3.2	3.44	3.12	3.2	3	2.92	31.76
lV Deck—B REG	3.08	3.08	3.13	2.88	3.21	3.21	3	3.08	3.08	2.71	30.46
AVERAGE	**3.34**	**3.14**	**3.17**	**3.01**	**3.35**	**3.4**	**3.13**	**3.19**	**3.12**	**2.93**	**31.78**

Source: Own compilation

Figure 1 tells the comparison of all average GSE scale for each class. The highest score from IV Deck-B MANDIRI and the lowest is IV Deck-B REG. It means that most of the cadets from IV Deck-B MANDIRI have better self-efficacy than cadets from IV Deck-B REG. All the class has greater than 30 point and has average 31.78 GSE scale.

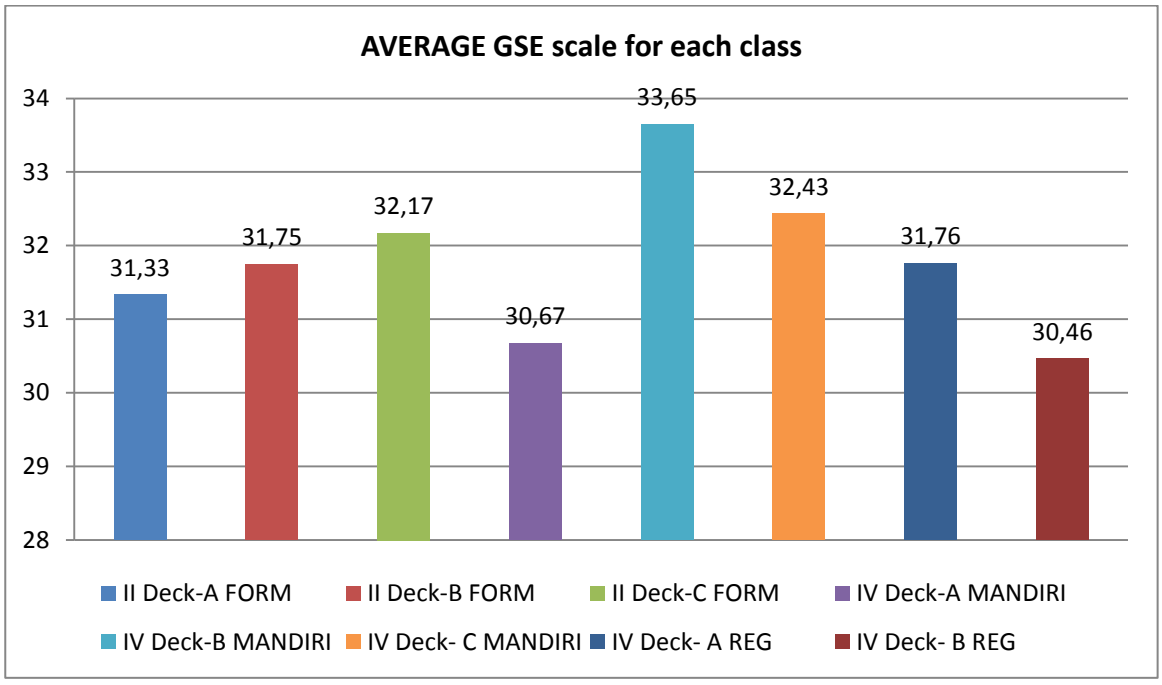

Figure 1. Average GSE scale for each class

Source: Own compilation

The implementation of GSE by Scholz et al., (2002) with nearly 20,000 people in 25 countries found that the international average was 29.55 points (on a scale from 0 to 40). It is curious that the Japanese scored lowest and the Costa-Ricans highest. Here are (in table 4) some averages from the paper by Scholz et al., (2002):

Table 4

Average GSE

Country	Average GSE
Japan	20.22
Hong Kong	23.05
International average	**29.55**
France	32.19
Denmark	32.87
Cost Rica	33.19

Source: Own compilation

Cadets have 31.78 average GSE scale and international average was 29.55, so it can be inferred that cadets' self-efficacy is better than international average. However, from Figure 2 it can be seen that some aspects still need to be improved like in question 10 (with score 2.93) and question 4 (with score 3.01). Questions 10 and 4 ask about "I can usually handle whatever comes my way" and "I am confident that I could deal efficiently with unexpected events". Both of them deal with how someone is firm on his choice while facing all obstacles that confront. Cadets should improve it. The lecturer can help cadets by integrating self-efficacy skill in the classroom.

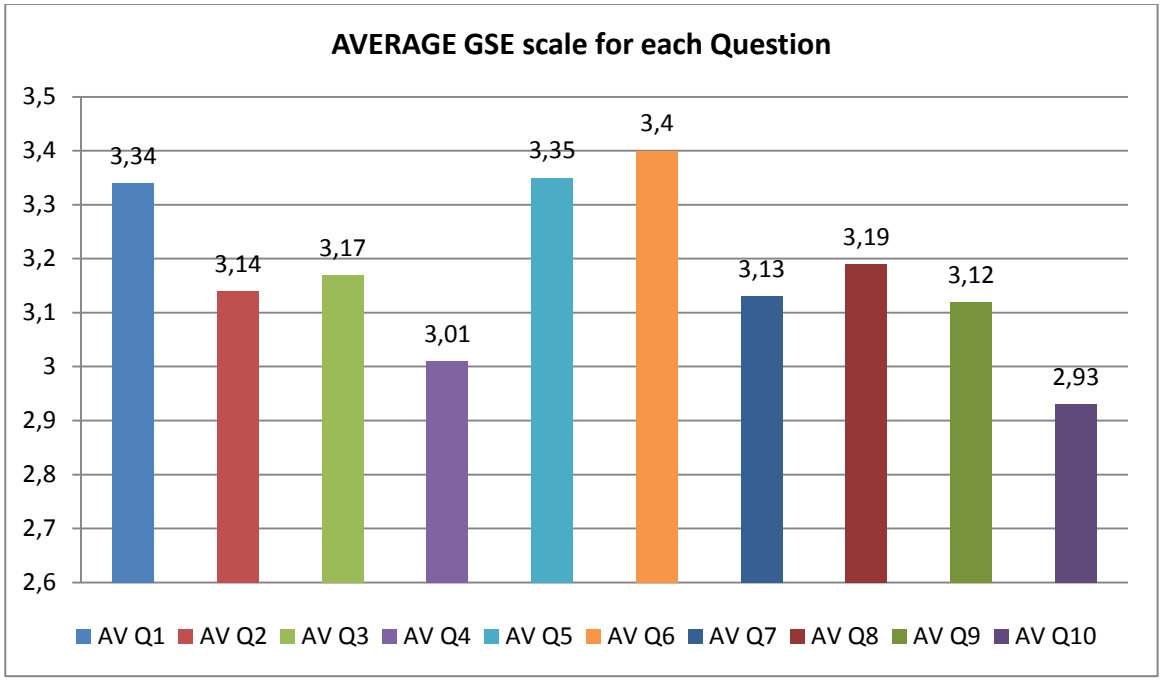

Figure 2. Average GSE scale for each question

Source: Own compilation

CONCLUSION

The aim of this study was to report the cadets' self-efficacy at Collision Prevention Regulations on Sea and Guard Service course. Based on the findings and discussion, cadets' self-efficacy is greater than international average of GSE. However, cadets need to develop creative thinking skill in dealing with unexpected condition or someone who opposes in gaining their goal. These findings suggest that self-efficacy should integrate into classroom learning. For the next research there can be developed instructional design to improve self-efficacy skill effectively and efficiently.

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ПІДВИЩЕННЯ САМОЕФЕКТИВНОСТІ КУРСАНТІВ ДЛЯ ЗАБЕЗПЕЧЕННЯ БЕЗПЕЧНОГО МАЙБУТНЬОГО МОРЯКА

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Людська помилка, яка спричиняє аварії, є однією з найважливіших проблем морських секторів. Насправді більшість нещасних випадків трапляються в основному через людські помилки, тому необхідне прийняття правильних рішень. У вирішенні проблеми однією з важливих навичок є самоефективність. Метою статті є дослідити способи підвищення самоефективності з метою забезпечення безпечного майбутнього моряків. Курсанти повинні володіти високим ступенем самоефективності, щоб забезпечити безпеку майбутнього мореплавства (навіть у надзвичайному стані). У цьому дослідженні повідомляється про ефективність курсантів щодо правил запобігання зіткненням на курсах морської та охоронної служби. Дані були взяті кількісно. 142 курсантам палубного відділу було запропоновано відповісти на Загальний опитувальник самоефективності (GSE). Дане дослідження вказує на те, що самоефективність курсантів перевищує середній рівень середнього міжнародного рівня GSE. Однак курсанти повинні розвивати навички креативного мислення в умовах надзвичайних обставин або на протидію тим, хто виступає проти досягнення мети. Ці висновки свідчать про те, що самоефективність повинна бути інтегрована у навчання в класі. Для наступного дослідження може бути розроблений навчальний дизайн для ефективного та ефективного вдосконалення навичок самоефективності.

Ключові слова: самоефективність, курсанти, безпечне мореплавання

ПОВЫШЕНИЕ САМОЭФФЕКТИВНОСТИ КУРСАНТОВ ДЛЯ ОБЕСПЕЧЕНИЯ БЕЗОПАСНОГО БУДУЩЕГО МОРЯКА

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Человеческая ошибка, которая приводит к аварии, является одной из важнейших проблем морских секторов. На самом деле большинство несчастных случаев происходят в основном из-за человеческие ошибки, поэтому необходимо принятие правильных решений. В решении проблемы одной из важных навыков является самоэффективность. Целью статьи является исследовать способы повышения самоэффективности с целью обеспечения безопасного будущего моряков.

Курсанты должны обладать высокой степенью самоэффективности, чтобы обеспечить безопасность будущего мореплавания (даже в чрезвычайном положении). В этом исследовании сообщается об эффективности курсантов о правилах предотвращения столкновений на курсах морской и охранной службы. Данные были взяты количественно. 142 курсантам палубного отдела было предложено ответить на Общий опросник самоэффективности (GSE). Данное исследование указывает на то, что самоэффективность курсантов превышает средний уровень среднего международного уровня GSE. Однако курсанты должны развивать навыки креативного мышления в условиях чрезвычайных обстоятельств или на противодействие тем, кто выступает против достижения цели. Эти выводы свидетельствуют о том, что самоэффективность должна быть интегрирована в обучение в классе. Для последующего исследования может быть разработан учебный дизайн для эффективного и эффективного совершенствования навыков самоэффективности.

Ключевые слова: самоэффективность, курсанты, безопасное мореплавание.