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STUDY ON THE TRAINING EFFECT OF THE SAIL TRAINING

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Abstract. Sail training involves the acquisition of the knowledge and skills related to vessel operations. It has is believed that sail training can enhance leadership, teamwork, and communication capabilities, all of which are related to EQ (emotional intelligence quotient). Allison et al. researched the characteristics and values of sail training and reported that young trainees who participated in off-shore sail training programs exhibited measurable improvements in social confidence and their ability to work with others. Kunieda et al. also demonstrated that the effects of the sailing vessel training improved a trainee's EQ, especially in communication skills, positive-thinking, and self-control. In this paper, we examined each EQ factor related to improvements in competency using a case study. It was found that seven EQ competency items had significantly improved for some participants. Further, our study revealed that sail training could not just assist participants control their own feelings but also encouraged active and positive-thinking and improved cooperativeness. In the case study trainee's essay regarding the sail training, it was described how the team cooperated and overcame difficult situations during the voyage. The trainee also emphasized communication and teamwork. If trainees do not pull together as a team, they are unable to achieve their ultimate purpose. The trainee's essay on the sail training was further analyzed using text mining, and we were able to extract the frequently occurring words, such as "precious experience," "learning" and "significant." Using the grounded theory approach (GTA), which is a qualitative analytical approach, coding and categorization were performed and a hypothetical construction was attempted. As an example, we were able to apply label names, such as "the powerfulness of a wind," "powerless in front of nature," and "hardship of the calm." We summarized these label names under the category "natural experience in sail training." Categories, such as "humane growth" "bilateral work and community life," and "goal achievement," were similarly obtained. We developed the following hypotheses from these relations. "Working together with a friend, overcoming many difficulties during the sailing voyage, and arriving at the destination improves confidence, cooperativeness, teamwork, and communication skills."

Key words: sail training, EQ, text mining, grounded theory approach

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1 INTRODUCTION

The effectiveness of sail training has been widely accepted and researched. Kunieda et al. conducted a creativity test before and after a voyage and demonstrated that there was a remarkable improvement in the "frequency" and "originality". Kunieda et al. further investigated using a questionnaire and found that the effect of the sail training improved the trainee's EQ across nine EQ competencies, with significant improvements shown in "communication skills," "positive-thinking," and "self-control."

Using a case study analysis, we examined EQ competency improvement in detail. We also analyzed the trainee's sail training essay using text mining and then further analyzed the essay using the grounded theory approach (hereinafter "GTA").

2 CASE STUDY

We conducted an investigation into a change in the consciousness among trainee merchant marine university students before and after going on an ocean voyage aboard the sail training vessel Kaiwo Maru. From the EQ competency questionnaire, improvements in communication skills, positive thinking, and self-control were observed.

2.1 Growth in EQ competency

Each EQ competency improved notably, as indicated in Fig. 1. Remarkable improvements were found in self-control and positive thinking, and there were some improvements in teamwork, activeness, and situation awareness. When the contents of each question were

investigated in detail, the following replies indicated significant improvements in self-control.
1. "When being suppressed, taking suitable action is possible"
2. "Being able to have the presence of mind, even when things do not progress satisfactorily."

This trainee indicated the following in his essay. "Since a present-day vessel completely differs in operation, it may be that it is meaningless in itself. However, for this training, I think that all the things to become a navigational officer are condensing." Therefore, over time, the sail training became meaningful. Further, in the trainee's essay, he twice described his team as "the highest team"; thus, we surmised from this that he had a successful experience and overcame many difficult situations as a part of the team.

2.2 Growth with sociability

Hospitality, teamwork, and positive thinking all significantly improved, as shown in Fig. 2. When the replies to the question content were investigated in detail, all questions relevant to sociability showed improvement.

The following content were found in this trainee's essay. "There was no useless day. Mental growth was the largest, although many things including technical skills were learned. I can be gazing at the future and acting calmly, and I can work while caring about friends." While learning teamwork and cooperating with friends, hospitality regarding work-sharing and caring about friends was cultivated. Furthermore, the trainees thought, "There was no useless day." He positively analyzed his personal growth as "mental growth" and felt that this was his greatest achievement, even though they were studying many other things.
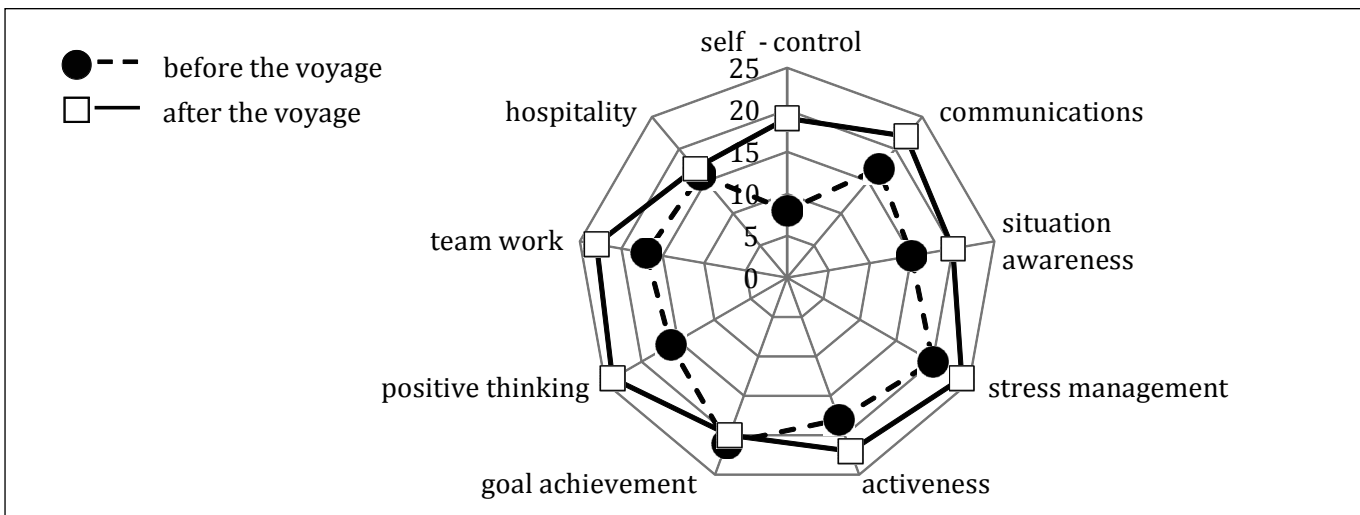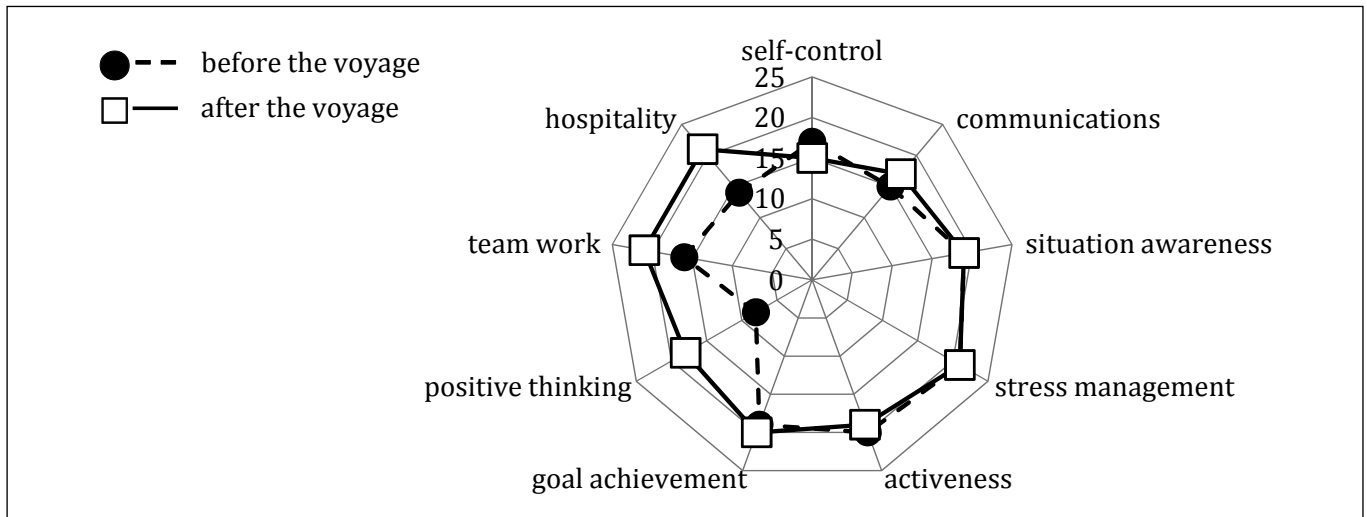

Figure 1 Growth in EQ competency

Figure 2 Growth in sociability

3 ANALYSIS OF ESSAY

3.1 Text mining

Text mining divides words or phrases in a text using natural language analysis techniques, and then analyzes the frequency of appearance of certain words and the correlation. We analyzed the essays from the Kaiwo Maru's training using text mining. The participants were 77 merchant marine university students (including six women), and the essays were written in the final stage of the training.

The fundamental information about the texts was as follows; 6,952 words and 993 sentences, from which 2,297 word classifications were obtained. The most frequent words (Top 20) are shown in Fig. 3. Many of the words referred to "training" and since it was an essay about training, this was to be expected. The description of the training was given, with most referring to "sailing under wind," and "training to climb the mast." Further, there were also references to "ship handling training (Training of lowering and raising the anchor)" and "voyage plan presentation."

The descriptions which included "experience" were generally affirmative with the descriptions of a good and wonderful experience. The word "fear," was found to be associated with a fear of heights when training to climb the mast. Many affirmative sail training descriptions were associated with the words "growth" and "significant." Eighty-two references were found related to cooperativeness and teamwork, such as "cooperation," "community life," "the people of the room," "group member," and "each other."
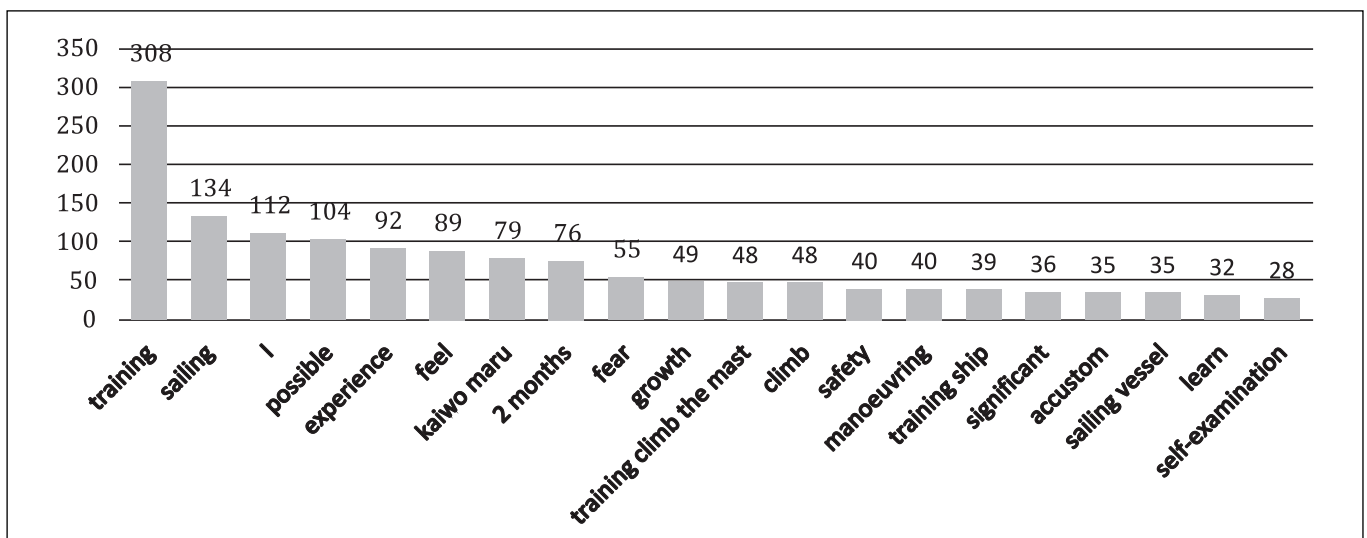

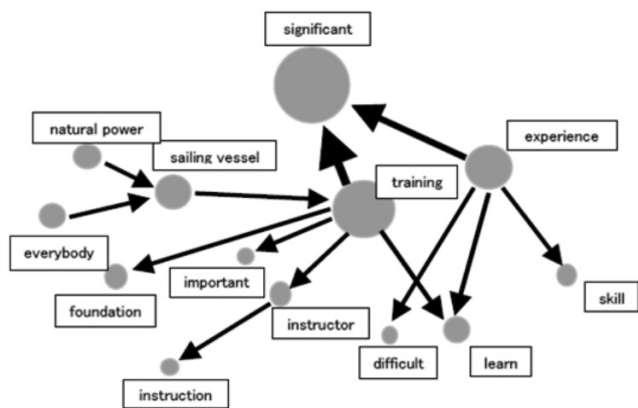**Figure 3** Frequently appearing words (Top 20)

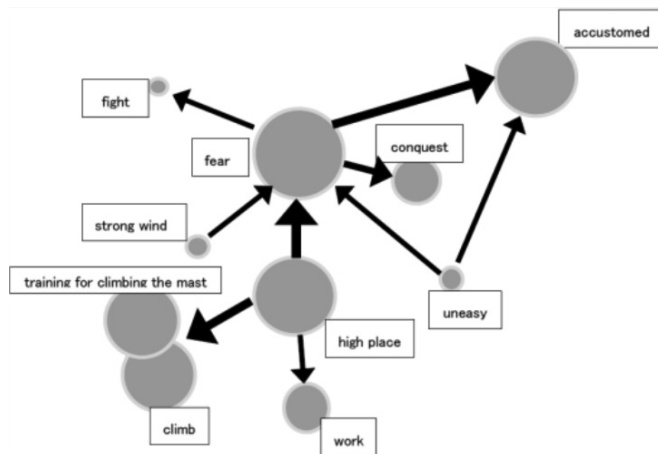**Figure 4** Attention analysis (significant)

Figure 5 Attention analysis (fear)

Next, the analysis examined the use of the word "significant," as shown in Fig. 4. The size of a circle shows the frequency of its appearance in the figure. That is, as can be observed, there were more words related to "significant," "training" and "experience" than other words. There were words describing "training," and "experience" separately, as well as words drawn from both. The word "significant" was found to be generally used in the affirmative when related to "training" and "experience." Therefore, the trainees who felt the voyage was significant for their training considered the training and experience in the affirmative.

A further analysis was conducted on the word "fear," which is considered to be comparatively negative, as shown in Fig. 5. The main word related to the cause of fear was "high place," with a few instances of "strong wind." A related word "accustomed" and "conquest" were also drawn from the word "fear." "Fear" was found to be related to climbing to a high place and working on a high place and having conquered the fear, the trainees become accustomed to it. Both "significant" and the "fear" from the trainees' essays were considered to be positively associated with the training.

3.2 Grounded theory approach (GTA)

GTA is the qualitative analysis of a text and is used to extract the applicable contents from a text, divide them as objectively as possible, and then label them, the results from which are then used for target theory establishment.

Table 1 The example of data coding

| No.	Data	Property	Dimension	Label name
1	Navigational skills with a sailing vessel was able to be accomplished by pulling together.	The feature of the sailing vessel's navigational skill	·An understanding of the sailing vessel's navigational skill	(1) The features of sail training
		incubating cooperativeness	An education in emotional behavior	(2) The effects of sail training
2	The group members who overcame the rough sea together were able to have the strongest united power.	Improvements in united power	The effect of the rough seas	(3) The educational power of nature
3	Felt the training confronted the grandeur of nature, especially the wind.	the characteristics of nature, such as the wind	Own feelings	(4) Training from nature
4	The head target was missed repeatedly and it was grasped only by hearing the ship's position from an officer or other trainees.	Difficulty of practical training	An understanding of the trainee's own ability	(5) The effect of practical training
	-From this experience, I keenly realized that I had little knowledge.	Experience of practical training	A self-examination from training	(6) An understanding of reality and oneself
5	Man the yards was judged most impressive.	Confidence and pride through impression	The impression of man the yards	(7) The effect of man the yards
6	I would like to think positively and to use this in my life in the future.	message of the training	a self-examination of the training	(8) The effect of training, and usefulness of the training
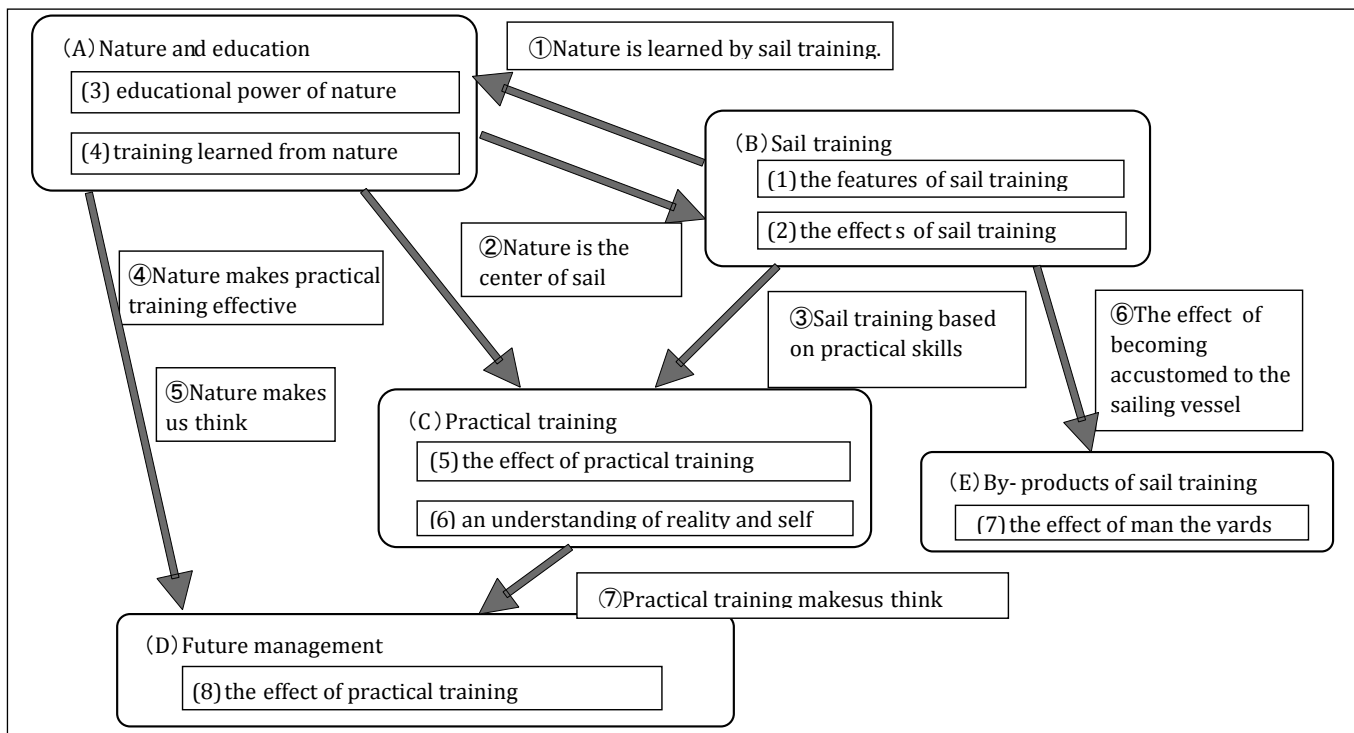
Figure 6 Categories identified by the GTA

The Kaiwo Maru trainees' essays were analyzed using GTA, which highlighted the hypothesis about the sail training effect. Texts about training were extracted from the trainees' essays, and this was processed using a procedure called "coding." Coding consists of two steps; "sectioning of data," and "labeling." Sectioning divides the data so that those who analyze the data objectively can understand the context. Next, a label name, which expresses a property and a dimension, is given to the data that was sectioned using GTA and are specifically attached to the sectioned data and then the coding is complete. An example of the data coding is shown in Table 1. In the data column of Table 1, the content regarding training was extracted.

"Category extraction" is a procedure in which the coded data and items that are similar based on the label name are collected and extracted, as shown in Fig. 6. By performing a series of category extractions and category relationships using the GTA, a hypothesis regarding the evaluation of the sail training was identified.

"By coming into close contact with nature, such as the wind and a wave, the power of nature was learned and this was one of the training effects of the sailing vessel voyage."

"Pulling together with a friend, overcoming many difficulties in the sailing voyage, and arriving at the destination improves confidence, cooperativeness, teamwork, and communication skills."

4   CONCLUSION

The effect of sail training was measured using an EQ competency questionnaire. One example showed a remarkable improvement in seven of the nine EQ competency items. This EQ competency improvement in the trainee was observed in the training essay. It was also found that hospitality improved and the text analysis from the essays uncovered competency improvements. The sail training essays were analyzed using text mining and a frequency word analysis was conducted. Then attention analysis, which focused on a certain word, was conducted, and it was found that the trainees considered the training to be a positive experience. A hypothesis about the effect of sail training was developed as a result of the GTA qualitative analysis of the sail training essays.

As a result of the various analyses, a fixed result was obtained. Although there was further data in the essays about the training on the training ship, it was not completely used in this paper. As text mining can process a lot of text data easily, we plan on continuing this analysis and as GTA, which is qualitative analysis, is also considered effective, we plan to further analyze the data using this technique.

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