IOSR Journal of Mechanical and Civil Engineering (IOSR-JMCE)
e-ISSN: 2278-1684,p-ISSN: 2320-334X, Volume 18, Issue 5 Ser. IV (Sep. – Oct. 2021), PP 34-39
www.iosrjournals.org

The Performance of the Training Vessel Unit in Improving the Competence of the Makassar Maritime Science Polytechnic Cadets

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Abstract: *Maritime Science Polytechnic is a higher education with applied skills in shipping science is directed at producing professional graduates. The Sultan Hasanuddin training vessel is intended to prepare competent human resources. This study aims to analyze the performance of the training vessel unit and the level of competence of cadets using a qualitative descriptive method. The results showed that the performance of the training vessel unit was in a good category, had carried out the duties and responsibilities in improving the competence of cadets with an average value of 76.9%, seen from a total of 97 participants who passed the Seafarer Skill Test only 13 participants and according to the established regulations. The Seafarer Expertise Examiner who passes the seafaring skill test is competent cadets and get a level III nautical expert certificate. Furthermore, the graduation rate comparison of cadets prala prala in the last five years has increased since the existence of a training vessel in the environment of Makassar Maritime Science Polytechnic with a comparison in 2014 of 5% and in 2019 as much as 56%.*

Keywords: *Shipping, cadet competence, training vessel*

Date of Submission: 28-10-2021 Date of Acceptance: 12-11-2021

I. Introduction

The Makassar Maritime Science Polytechnic (PIP Makassar) is a higher education institution that organizes vocational education within the scope of the shipping sector. Based on PM 87 of 2015 concerning the Statute of the Makassar Maritime Science Polytechnic. PIP is directed to produce graduates who are professional and reliable in the shipping field, meet national and international standards and are able to compete in the global market. Therefore, students are equipped with the ability, expertise and discipline according to standards. To improve the competence of PIP Makassar alumni, both theoretical and practical lessons were held. Theoretical learning is carried out in the classroom, practical in the lab/simulator as well as training on the training ship, so that the cadets are more adaptable to the atmosphere on board.

PIP Makassar has a training vessel to facilitate the practice of training for cadets, namely the Sultan Hasanuddin Training Vessel which was built in 2016, with a dead weight of 1,200 Gross Tonnage. This vessel has a capacity of 20 crew members, 4 VVIP passengers, 10 instructors and 100 passengers. This training vessel is built of fully welded steel, two propellers, and driven by two diesel engines. Based on the Letter of the Sea No.AL.520/40/6/DK/2019, the Director of Shipping and Maritime Affairs stated that the training vessel has an overall size of 63 meters with a vertical line length of 59.71 meters, a width of 12 meters, a height of 4 meters, GT 1,257, NT 378 and the water depth requirement is 2.8 meters. This ship has a capacity of 115 tons for fuel tanks and 175 tons of fresh water tanks.

Training vessels are outputs that must be utilized so that the outcomes in the form of better shipping school cadet competencies, as required in the 1978 STCW. Therefore, new seafarers are required to undergo various training and attend courses in accordance with the requirements of the International Maritime Organization (IMO) as a form of preventive measure accidents [12]. The Makassar PIP Training Vessel Unit is one of the supporting units responsible for preparing training vessels for academic activities. The training vessel unit consists of 3 people, the head of the unit and 2 staff. While the training ship Sultan Hasanuddin is crewed by 19 crew members and teaching instructors for the training vessels are 9 people, but technically the teaching instructors consist of teaching lecturers in accordance with the assignment orders given. The description of the Sultan Hasanuddin Training vessel can be seen in Figure 1.

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Figure 1. Sultan Hasanuddin Training Vessels

So far, the training vessel has functioned for activities such as basic marine practice 'TEKDASTAN', cadet practical learning, practical learning of seafarer skills training 'DKP', practical training for improvement, and as a place for competency testing of the loading and unloading workforce certification scheme 'TKBM' by LSP P1 PIP Makassar.

Training plays an important role in shaping behavior that can directly or indirectly affect safety [4]. Work-related procedures were made a requirement to reduce the occurrence of major accidents on board because inadequate training was identified as a major factor causing accidents [5]. Thus, training and education programs for seafarers on safe behavior while on board should be included in the work-related procedures [6].

Training and assessment standards must exceed the minimum requirements of the STCW (AGCS 2015) to ensure that operational errors that cause costly marine disasters are reduced to a minimum [7]. It is expected that the output produced by the training ship unit is cadets who are tenacious, skilled and competent. Therefore, new seafarers are required to undergo various trainings and attend courses in accordance with the requirements of the International Maritime Organization (IMO) as a form of preventive measure [8].

In an effort to improve the performance of employees on a training vessels, there are several factors that have an influence, namely discipline, an attitude of behavior and actions that are in accordance with organizational regulations, both written and unwritten. So, discipline is an organizational rule that must be obeyed and adhered to [9].

II. Methodology

The research is located at the Makassar Maritime Science Polytechnic and the Sultan Hasanuddin training ship, which is at the Untia Archipelago Fisheries Port, Makassar City. The research is descriptive-quantitative. Primary data was obtained through a questionnaire given to respondents, to assess the performance of the training ship unit staff, training ship crew and training ship instructors. Secondary data is in the form of supporting documents for the implementation of practical activities on the Sultan Hasanuddin training ship. The data in question can be seen in Table 1.

Table 1. Types and Sources of Data

No.	Data	Data Needs	Source
1.	Decision of the Director/leader regarding practical activities on the training vessels	- Decree of the leadership related to the implementation of activities - Practice schedule - Academic calendar of cadets - Instructions for Instructor Assignments	Training Vessel Unit of PIP Makassar
2.	Systems and procedures on the training ship	- Vessel Particular - Vessel logbook - Drill Schedule - Details of the duties of the crew of the training ship (crew work permit)	Training Vessel Unit of PIP Makassar
3.	Cadets Competency Test	Announcement of Cadet Sailor Skills Exam	PUKP 7 Makassar

Data analysis stages:
1. Analysis of the feasibility of the training vessel as well as providing several statements to the crew through a questionnaire.
2. Identifying the performance of the relevant section of the training ship unit staff, ship crew and ship instructors through the armature to the authorities.
3. Draw conclusions through the results of the cadets' skill test since the last 5 years.

From the data collected, then a quantitative descriptive analysis (interval data) was carried out with a scale of four [19]. The reference value to a scale of four can be seen in Table 2.

Table 2. Rating Category

Value Range	Categories
$x \geq M + 1 . Sd$	Very good
$M s.d \leq x < M + 1 . Sd$	Good
$M - 1 . Sd \leq x < M$	Poorly
$X < M - 1 . Sd$	Not good

Information:
M = Mean achievable ideal
= (highest ideal score + lowest ideal score)
Sd = ideal standard deviation achieved
= 1/6 (highest ideal score – lowest ideal score)
x = value achieved by students
then look for the percentage of each data with the percentage formula [20]:
P = f/N x 100%
Information :
P = Percentage
f = Frequency (number of respondents' answers)
N = Number of cases (number of respondents)

III. Discussion

Performance is the result of work that is concrete, observable, and measurable [13]. To measure the performance of the staff of the Sultan Hasanuddin Training Vessel unit, it is seen from 3 factors, namely discipline, education and training, and work atmosphere. The data obtained from the performance of the staff/manager of the training ship unit can be seen in the very good category as many as 14 people, the Good category as many as 4 people, the poor category as many as 1 (one) person and the bad category as many as 4 (four) people. With these results it can be stated that the performance of the staff / manager of the training ship unit is categorized as very good, a description of each indicator can be seen in Table 3.

Table 3. Description of the performance indicator data for the staff/manager of the training vessel unit

Indicator	Data	Category			
		Very good	Good	Poorly	Bad
Discipline	Interval	≥ 24	22 sd < 24	20 sd < 22	< 20
	Frequency	18	3	1	1
Job and function	Interval	≥ 40	36 sd < 40	32 sd < 36	< 32
	Frequency	15	4	-	4
Work atmosphere	Interval	≥ 12,66	11 sd < 12,66	9,34 sd < 11	< 9,34
	Frequency	18	2	3	-

Source: Data Processing Results, 2021

The supporting data used in reviewing the discipline of the training ship unit staff is employee attendance data from January - March 2020 which is then processed and gets good results. The total working hours that should be carried out by the manager/staff of the training ship unit according to the data obtained with a percentage of 99% is considered much disciplined in attendance.

The performance of the crew of the training ship in accordance with the authority and responsibility of the position on the ship can be seen from 3 indicators, namely discipline, quality, and ability, as well as care and maintenance. Individual skills can be divided into two parts, namely actual skills and potential abilities [14]. The training ship crew in this case affects the operational and readiness of the training ship in its function as a means

of learning for cadets so that they can assist teaching instructors in carrying out the learning process on the training vessel.

The data obtained related to the performance of the crew of the training ship in the very good category as many as 2 people, the good category as many as 2 people, and the bad category as many as 1 person. With these results it can be stated that the performance of the crew of the training ship is categorized as very good, a description of each indicator can be seen in Table 4.

Table 4. Description of the performance indicator data for the training ship crew

Indicator	Data	Category			
		Very good	Good	Poorly	Not good
Discipline	Interval	≥ 58,8	57 sd < 58,8	55,2 sd < 57	< 55,2
	Frequency	4	-	-	1
Quality and Ability	Interval	≥ 48	44,5 sd < 48	41 sd < 44,5	< 41
	Frequency	1	2	-	2
Care and Maintenance	Interval	≥ 32,3	30,5 sd < 32,3	28,7 sd < 30,5	< 28,7
	Frequency	1	2	1	1

Source: Data processing results, 2021

By using ship crew attendance data to review discipline, in this recapitulation we can see that every month the attendance of training ship crews is at a percentage of 99% to 100% in March 2020. Furthermore, in the maintenance and maintenance review, it can be seen in the daily vessel maintenance report. In the Maintenance dayli report, Sultan Hasanuddin KL shows that every crew has carried out routine maintenance and maintenance.

The performance of the Trainer Instructor can be seen from 3 indicators, namely quality and ability, work atmosphere, as well as adaptability and communication. The quality of teaching performance is the most influential factor in student achievement [15]. Adequate and appropriate guidance from the teacher will be another factor that affects the achievement of student competence [16]. Students often face many problems in developing positive learning attitudes and good study habits [17].

The data obtained from the performance of the training ship instructors can be seen in the very good category as many as 11 people, the good category as many as 5 people, the poor category as many as 3 people, and the bad category as many as 1 person. With these results it can be stated that the performance of the instructors of the training ship is categorized as very good, a description of each indicator can be seen in Table 5.

Table 5. Description of the data on the performance indicators of the Instructor Training Vessel

Indicator	Data	Category			
		Very good	Good	Poorly	Not good
Quality and ability	Interval	≥ 48,33	43 sd < 48,33	37,67 sd < 43	< 37,67
	Frequency	7	8	4	1
Work atmosphere	Interval	≥ 24,66	22 sd < 24,66	19,34 sd < 22	< 19,34
	Frequency	10	6	3	1
Adaptability and communication	Interval	≥ 24,66	22 sd < 24,66	19,34 sd < 22	< 19,34
	Frequency	7	3	6	4

Source: Data processing results, 2021

An instructor of the Sultan Hasanuddin training vessel must meet the required qualifications, this can be seen in the Decree of the Director of the Makassar Maritime Science Polytechnic Number: SM.002/50/4/PIP.MKS-2020 concerning the first amendment to the decision of the director of the Makassar Maritime Science Polytechnic Number: SM.002/44/21/PIP.MKS-2019 concerning the implementation of shipping education and training programs at the Makassar Maritime Science Polytechnic public service agency 'BLU' for the 2021 budget year. So that it can guarantee the quality of learning that will be given to cadets. The training ship instructors carry out the learning process very well, and feel comfortable and safe with the learning atmosphere on the training vessel. The responsiveness and communication carried out by the instructors of the training boats are very good, from the instructions or directions given can be implemented and responded to very well by the cadets.

Several factors affect the standard of a student to be categorized as capable of mastering the required level of competence. These factors come from the students themselves, teachers and their supporting environment [18]. The competence of PIP Makassar cadets is expected to be further developed with the facilities provided, one of which is the Sultan Hasanuddin Training Vessel which is used as a learning medium other than a simulator. Before there was a cadet training vessel using a simulator, which can describe the situation of a simulated ship on land in a room equipped with tools that resemble the original. The level of competence or

assessment related to the competence of cadets can be seen based on the results of the ANT III post-prala seafarer skill test.

The post-prali seafaring skills exam consists of 10 test items for the CBA exam and 3 functions for the comprehensive exam. A total of 13 assessment indicators, to declare PIP Makassar cadets to be competent, the standard passing grade are 70. So based on the calculated post-prala cadet skill test scores, the cadet graduation rate per test item can be categorized as shown in Table 6.

Table 6. The passing rate of cadets/I in all test eye indicators

No.	Test subject	Achievements	Amount	Percentage
1	Plan and Conduct a Passage and Determine Position	Fulfil	84	87,5
		Fail	12	12,5
2	Use of RADAR and ARPA to Maintain Safety of Navigation	Fulfil	73	76
		Fail	23	24
3	Use of ECDIS to Maintain The Safety of Navigation	Fulfil	27	28
		Fail	69	72
4	IMO Standard Marine Communication Phrases and Use English in Written and Oral Form	Fulfil	91	95
		Fail	5	5
5	Transit and Receive Information by Visual Signalling	Fulfil	33	34
		Fail	63	66
6	Monitor The Loading, Stowage, Securing, Care During The Voyage and The Unloading	Fulfil	78	81
		Fail	18	19
7	Inspect and Report Defects and Defects and Damage to Cargo Spaces, Hatch Covers and Ballast Tanks	Fulfil	77	80
		Fail	19	20
8	Apply Medical First Aid on Board Ship	Fulfil	46	48
		Fail	50	52
9	Monitor Compliance with Legislative Requirements	Fulfil	83	86
		Fail	13	14
10	Appliacation of Leadership and Teamworking Skills	Fulfil	83	86
		Fail	13	14
11	Navigation at Operational Level	Fulfil	96	100
		Fail	0	0
12	Cargo Handling and Stowage at Operational Level	Fulfil	96	100
		Fail	0	0
13	Controlling The Operation of The Ship and Care for Persons on Board at Operational Level	Fulfil	95	99
		Fail	1	1

Source: Data processing results, 2021

From the comparison of the number of passing test indicators that meet the standards and those that do not meet the standards, it can be said that the skill test scores of cadet sailors are above the average with a percentage of 76.9% having been met, with details of 10 of the 13 test items that have met the standard. With a total of 13 assessment indicators, if one of the test subjects gets a score below the standard, the cadet is declared not to have passed or is not competent to hold a certificate of nautical seafaring expertise level 3 as many as 13 cadets passed, 83 cadets had repeat status, and 1 (one) cadet did not attend. Thus, the competence of adult cadets in the 7th semester of PIP Makassar has not met the standards seen from the small number of test takers who passed even though the percentage of average scores for all exams is very good.

To find out the competence of the cadets since the training ship was available, a comparison of the results of the seafarers' skill test for the last 5 years before the training ship was carried out was carried out. The Sultan Hasanuddin training ship has been present in the PIP Makassar environment since 2018 and is optimally operating in 2019. It can be seen in Table 7.

Table 7. Percentage of passing ukp prala 5 years 2014-2019

No.	Exam Period	Number of participants	Exam results		Graduation Percentage
			Graduated	Test	
1	March 2014	173	9	164	5%
2	March 2015	155	14	141	9%
3	January 2016	149	30	119	20%
4	March 2017	172	47	125	27%
5	July 2018	152	8	144	5%
6	November 2019	293	164	129	56%

The graduation rate of cadets in 2014-2019 at a percentage of less than 50% in 2019 increased by a percentage of 56%, showing that since the existence of the training ship it has made a fairly good contribution to the competence of cadets. So, judging from the percentage of graduation in 2019, when compared to the previous year, it had increased quite a bit, but the test results showed that 129 cadets were declared repeating. This makes the basis that the competence of PIP Makassar cadets must be further improved from all related lines, such as knowledge, skills and abilities in their respective fields.

IV. Conclusion

The relationship between the feasibility of the ship, the performance of the manager/staff of the training ship unit, the performance of the crew of the training ship, and the teaching instructors on the training ship, have been well implemented in creating or improving the competence of PIP Makassar cadets in accordance with the objectives of procuring training ships within the BPSDM environment Communication. The contribution of the Sultan Hasanuddin training ship in improving the competence of Makassar PIP cadets is quite large. The graduation rate for cadets used for the last 5 years shows quite good results. The competence of Makassar PIP cadets cannot be categorized as very good, because there are still around 129 people who repeat, so the learning method still needs to be improved

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Siti Rahima Marasabessy, et. al. "The Performance of the Training Vessel Unit in Improving the Competence of the Makassar Maritime Science Polytechnic Cadets." *IOSR Journal of Mechanical and Civil Engineering (IOSR-JMCE)*, 18(5), 2021, pp. 34-39.