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ANALYSIS OF RESOURCE BASED-VIEW IN POLITEKNIK PELAYARAN SURABAYA TOWARDS ETO AS COMPETITIVE ADVANTAGE

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ABSTRACT

The current world condition has changed quite significantly, the impact of black swans that occurred due to the COVID-19 pandemic contributed quite a lot to the Industrial Revolution 5.0 accompanied by the era of society 5.0 where humans work hand in hand with robots and everything is automation and digitization. This also has an impact on the shipping industry, including commercial ships, where currently individuals who have competence in the field of electrical systems are needed to keep mobilization and business in the maritime industry going on. Through the Standards of Training and Watchkeeping (STCW) all ships sailing currently have the obligation to assign individuals responsible for the electrical system on board the ship, namely the Electro Technical Officer (ETO). Given the high demand and level of urgency by various companies both domestically and abroad for ETO graduates, the Surabaya Shipping Polytechnic decided to open a Diploma III Study Program in Electrical Sailing, and obtained the first graduates in 2016. Based on the results of the analysis, it can be concluded that in Strategy and Operations Management, Politeknik Pelayaran Surabaya has made efforts to improve the quality of education for ETOp graduates, this is reflected in the proportion of budget allocations issued annually, the provision of adequate facilities and infrastructure, the evaluation of the performance and quality of teaching lecturers and educators on a regular basis, the preparation of curriculum and implementation in the form of textbooks and the interaction of teaching patterns with students as well as the existence of quality assurance. This success is reflected by the high absorption of ETO graduates at the Surabaya shipping polytechnic every year where most ETO graduates have been accepted for work within 1-3 months after graduation.

Keyword: Resource Based View (RBV), Electro Technical Officer (ETO), Dynamic Capabilty, Competitive Advantage, Strategy in Operation Management.

1. Introduction

Currently, the shipping world is entering the fourth industrial revolution which is characterized by automation and digitization, especially on commercial ships. Therefore, many things on board have undergone significant changes, including the electrical system on board the ship. The International Maritime Organization (IMO) itself as a United Nations Agency engaged in international maritime safety in its session through a subcommittee on Standards of Training and Watchkeeping (STCW) in charge of drafting provisions regarding education, training and certification for seafarers and parties working in the maritime sector has stipulated in the STCW 1978 amendments Manila 2010 a new educational path for ETO. This is because the electrical and electronic systems on ships have developed and changed rapidly. This progress includes two technical layers related to the complexity of marine electrical and electronic construction and device control as well as personal competencies related to and connected with new requirements for duty officers responsible for the control, maintenance, diagnostics and repair of electrical and electronic installations on board (Mindykowski, J., 2014). Mainly based on the development of new ships based on advanced technology, such as passenger ships, ferries, tankers, chemical and gas, container ships, oil rig suppliers and offshore. In many cases they are all electric vessels, ships equipped with a Dynamic Position System or ships with main engines with electronic control injection. An important aspect of this new technology is the large increase in the number of power converters in ship systems. Therefore, on board the ship, an electrical

engineering officer or known as an Electro Technical Officer is needed.

On this basis, in 2013 along with the organizational change from a hall to a university, the Surabaya Shipping Polytechnic opened the first Diploma III Electro Sailing study program in Indonesia equipped with an ETO Certificate of Competency (CoC) and until now has graduated 6 (six) batches from 2016 to 2021 which have been absorbed in the shipping industry both nationally and internationally. Based on this, in developing a higher education strategy to continue to be able to link and match with industry needs and be able to increase sustainable competitive advantages, an analysis is needed related to the resource-based view of the Surabaya ETO shipping polytechnic as a Competitive Advantage.

Resource Based View has 4 main measurement scales which as a basis for analyzing the quality of ETO that has a competitive advantage in Poltekpel Surabaya, namely Value (Quality of Individual, Accreditation of Institution), Rareness (Electro Shipping), Imperfectly Imitable Resources (where currently in Indonesia that provides ETO graduates are only 2 institutions, namely Poltekpel Surabaya and Poltekpel Malhayati Aceh), Non-Substitutability (ETO needs in the shipping industry and its correlation to Industrial Revolution 4.0 and Society 5.0). Currently, the shipping industry's demand for ETO is very high, but the availability of individuals with very low competence (demand over supply).

The purpose of this study is to understand that ETO as a superior product of Poltekpel Surabaya which has great potential as a *competitive advantage* and contributes to *industrial linkage in future implementation in* the world of Shipping through a *Resource Based View* point of view (RBV) fiber identifies the current level of ETO competence in Poltekpel Surabaya as well as strategies implemented in management operations at institutions in ensuring the quality of ETO.

This research focuses on the individual quality of ETO graduates influenced by Industrial Revolution 4.0 and Society 5.0 at the Surabaya Shipping Polytechnic. Where, individual quality is influenced by Training, Curriculum (Minimum of Qualification), Organizational activities, Characters, Values of institution, and IQF (Indonesian Qualification Framework). As well as Institutional Accreditation consisting of World Class University (AUN-QA, ABET, etc.), Industrial Linkage (Graduate Absorption), Research and Education, BAN-PT and Approval of the Directorate General of Sea Transportation (DJPL).

2. Research Method

2.1 Operations Management Strategy

Porter (1996) describes a strategy as a collection of unique combinations of resources, with a note: "This means deliberately selecting a different set of activities to provide a unique mix of values". Calling manufacturing a "missing link" in corporate strategy, Skinner urged managers to consider the reciprocal relationship between operations strategy and corporate strategy. The important role of the operation is to provide goods and services by effectively and efficiently converting inputs into *outputs* (Adam, 1983). In research Anand & Gray (2017) They try to combine strategy and organization, realizing that each topic may lean more towards one or the other. As well as, trying to be comprehensive, this list is not collectively complete; there may be papers in organizations and strategies in Operations Management outside of this topic. Topics envisioned in strategy and organization include:

a) Alignment: Conformity between strategy and operating organization and (1) corporate strategy and/or other functions, (2) task characteristics, and/or (3) external environment.
b) Formulation Process: Development and implementation of an operating strategy.
c) Configuration: Practice menu and/or performance dimensions (e.g., cost, quality, delivery, flexibility); a bundle of operations capabilities that define a specific operating strategy.
d) Sacrifices and Combinations: Substitution versus simultaneous development of different dimensions of operational performance.
e) Learning and Knowledge Management: Generation, maintenance, and renewal of operating capabilities; Knowledge transfer within and between organizations.
f) Incentives: The role of incentives at all levels of the organization with respect to strategic objectives.
g) Team Dynamics: Formation and structure of a limited-term project team as well as a long-term production and management team.
h) Operation Design: The structure and location of operations and the relationship of these decisions to other infrastructure and areas of the strategy structure.
i) Technology: Technology selection, integration between technologies, and

integration with other aspects of strategy and organization.

2.2 Resouces Based View (RBV) & Competitive Advantage

RBV theory discusses a resource-based view that applies the basis of a company's competitive advantage. The company's resources include all assets, capabilities, organizational processes, company attributes, information, knowledge, and so on, controlled by the company that allows the company to understand and and implement strategies developed for effectiveness and efficiency (Daft, Organization theory and design, 1983). Corporate resources are the strengths of a company that a company can use to understand and implement its strategy (Porter, 1981). Companies gain a sustainable competitive advantage by implementing their internal strength strategies, as well as responding to environmental opportunities, neutralizing external threats and avoiding internal weaknesses (Porter, 1980) (Penrose, 1959). The resource-based view (RBV) of strategic management states that the company's superior performance is due to superior resources. Those resources must be valuable and scarce (Barney, 1991). To achieve a sustainable competitive advantage, the theory of resource-based view hints at certain types of resources, namely resources that have valuable, rare, imperfectly imitable and Non-Substitutability properties commonly abbreviated as VRIN.

Valuable Resources. The essence of RBV logic is that the resources underlying the competitive advantage must be of value. The company's resources can only be a source of competitive advantage or a sustainable competitive advantage when they are valuable. As previously suggested, resources are valuable when they allow the company to understand or implement strategies that increase its efficiency and effectiveness. The traditional corporate performance model of "strength-weakness-opportunity-threat" suggests that companies can improve their performance only when their strategy exploits opportunities or neutralizes threats. Company attributes may have other characteristics that can qualify as a source of competitive advantage (for example, scarcity, non-replicable, non-replaceable), but these attributes only become resources when they exploit opportunities or neutralize threats in the corporate environment (Barney, 1991).

Rare Resources. Scarce resources are resources that other companies, especially competing companies, do not have. With scarce resources, companies can implement their strategies, and at the same time, competing companies do not have the ability to do the same, because they do not have similar resources in implementing these strategies. To gain a sustainable competitive advantage, companies are not only enough to have valuable resources, because it could be, some competing companies also have valuable resources. Companies that have valuable and scarce resources will usually become companies that have strategic innovators.

Imperfectly Imitable Resources. Valuable and scarce resources can only be a sustainable competitive advantage if other companies cannot replicate those resources perfectly. A company that has certain valuable resources that are rarely owned by the company (owned by fewer companies necessary to generate perfect competitive dynamics) and is acquired on unique historical circumstances, can gain a sustainable competitive advantage (that is, can increase its efficiency and effectiveness in a way that the competing company cannot do and in a way that the competing company cannot imitate over time time) (Barney, 1991). MET Standards for Electro Technical Officers There are three main factors for a company to have resources that cannot be imitated by other companies, namely: Unique historical conditions, Causal ambiguity, Complex social systems.

Non-Substituability. Resources that produce a sustainable competitive advantage must also have characteristics for which there is no substitute. That is, competitors do not have equivalent resources as substitutes in implementing their strategies. Although a company has valuable, unique and difficult to replicate resources, if competitors have equivalent substitutes, they are no longer a source of sustainable competitive advantage. The general conclusion is that a resource is valuable, scarce, and expensive to emulate, if it has a strategically equivalent replacement, and it is not uncommon or inexpensive to imitate, then it cannot be a source of continued competitive advantage.

3. Result and Discussion

ETO is an *Engineer Officer* who works under the leadership of the *Chief Engineer*, who has almost the same qualifications as an engineer but has greater knowledge of a variety of modern electrical and electronic systems. ETO is responsible for the maintenance and repair of all electrical and electronic equipment, installations

and machinery, also including radio communications and electronic navigation aids. The minimum competency standards for the ETO, set out in the STCW Convention and Code's Annex approved at the end of June 2010 by the Diplomatic Conference in Manila, and set out in STCW CONF.2 DC.2, 2010 include 18 competencies divided into three functions, referring to the STCW 1978 amendment 2010 to regulation III/6 and Code section A-III/6 the ETO competence is divided into 3 functions namely function I, function II, and function III.

a. Function I is electrical, electronics and control techniques at the operational level.
b. Function II is maintenance and repair at the operational level.
c. Function III is ship control and concern for personnel on board at the operational level.

All competency standards presented above form the basis for the development of the new IMO Model Course on Electro-Technical Officer (STW/44/3/1, 2012), presented and accepted in May 2013 in London at the 44th session of the STW Subcommittee.

Politeknik Pelayaran Surabaya in the 2013/2014 academic year has opened a new study program, namely electro-shipping which educates cadets to get adiploma z ah diploma III electro shipping and an ETO competency certificate to work as an electrical officer in the commercial ship shipping industry. The opening of the Electrical Shipping Study Program is one of them to accommodate STCW 1978 amendment 2010 to regulation III / 6 and Code Section A-III / on ETO.

Resource Based View (RBV) Approach The most common is the VRIN method which consists of Valuable Resources, Rare Resources, Imperfectly Imitable Resources and Non-Substitutable Resources. In this study, the main subjects were ETO graduates who came from Politeknik Pelayaran Surabaya. Valuable Resources is the ability to create value for ETO graduates by exploiting various opportunities or neutralizing various threats in the external environment of the Politeknik Pelayaran Surabaya. Rare Resources is a capability possessed by few competitors today. The competitive advantage was generated when the Politeknik Pelayaran Surabaya developed and exploited resources different from its competitors where it opened a new study program, namely Diploma III Electro Sailing. The scarcity of resources for ETO graduates is also assessed in terms of physical resources and human resources. Imperfectly Imitable Resources can only be a source of sustained competitive advantage if other agencies do not have them or it is difficult to obtain those resources. This ability is also said to be the ability of the Politeknik Pelayaran Surabaya to create something that cannot be imitated by other agencies. Imperfectly Imitable Resources is viewed in terms of physical resources and human resources. Non-substitutable Resources are resources that do not have a strategic equivalent. The less visible a capability is, the harder it is for other agencies to find a replacement and the greater the challenge for competitors to replicate the agency's value creation strategy. This ability to be difficult to replace is seen in terms of physical resources and human resources. An agency is said to have a competitive advantage when executing value-creating strategies that are not simultaneously implemented by potential competitors. Competitive advantage will be sustainable if such competitive advantage exists on an ongoing basis. Competitive advantage in this study is measured by product quality and ability to outperform competitors.

3.1 ETO's Role as a Competitive Advantage and its contribution to Industrial Linkage

The current world conditions have changed quite significantly, the impact of black swans that occurred due to the COVID-19 pandemic contributed quite a lot to the Industrial Revolution 5.0 accompanied by the era of society 5.0 where humans work hand in hand with robots and everything is automation and digitization. This also has an impact on the shipping industry, including commercial ships, where currently it takes individuals who have competence in the field of electrical systems to keep mobilization and business in the maritime industry going. Through the Standards of Training and Watchkeeping (STCW) all ships sailing currently have the obligation to assign individuals responsible for the electrical system on board the ship, namely the ETO. Given the high demand and level of urgency by various companies both domestically and abroad for ETO graduates, the Politeknik Pelayaran Surabaya decided to open a Diploma III Study Program in Electrical Sailing, and obtained the first graduates in 2016. The development of ETO graduates at the Politeknik Pelayaran Surabaya can be seen in Figure 1.

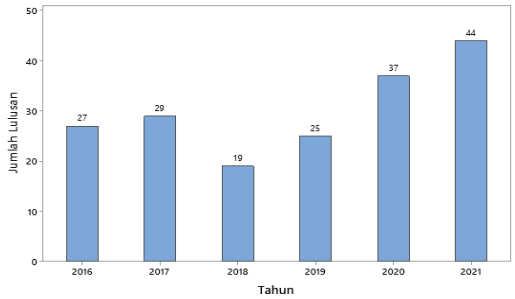

Figure 1. Development of ETO Graduates at Politeknik Pelayaran Surabaya

In 2016, 100% of ETO graduates from Politeknik Pelayaran Surabaya were accepted at PT. PELNI where 97% of graduates are dominated by men and all of them are women. In 2017, 100% of graduates were male where 65.5% of graduates were absorbed by PT. Pertamina Persero and the remaining 34.5% are absorbed by PT. Pertamina Persero. Wintermar.

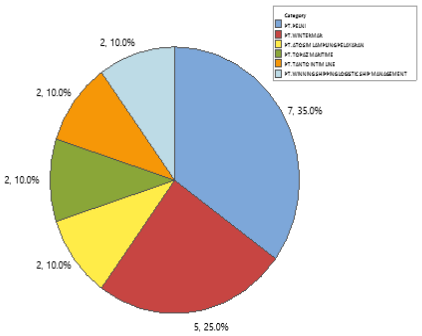

Figure 2. Pie Chart Absorption of ETO graduates by Companies in 2018

In 2018 the majority of graduates were absorbed by PT. PELNI as much as 35% followed by PT. Wintermar at 25% and PT. Atosim Lampung, PT. Topaz Maritime, PT. Tanto Intim Line and PT. Winning Shipping Logistic Ship Management which is 10% each. It was the same in 2016. in 2018 the majority of ETO graduates, namely 97% were dominated by men and the rest by women.

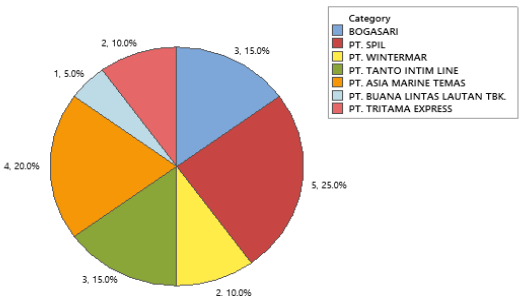

Figure 3. Pie Chart Absorption of ETO graduates by Companies in 2019

In 2019 the majority of graduates were absorbed by PT. SPIL as much as 25% followed by PT. Asia Marine Temas at 20%, PT. Tanto Intim Line by 15%, PT. Tritama Express and PT. Wintermar by 10%, as well as PT. Buana Lintas Lautan Tbk is 5%. It was the same in 2016. in 2019 the majority of ETO graduates, namely 97% dominated by men and the rest by women.

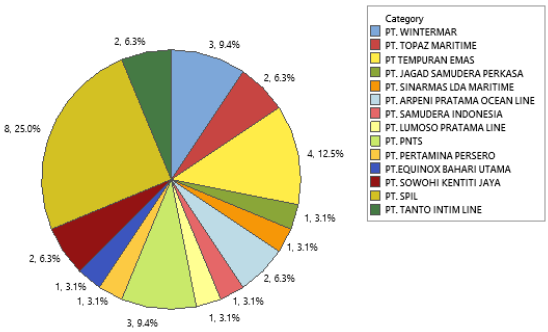

Figure 4. Pie Chart Absorption of ETO graduates by Companies in 2020

In 2020, 97.3% were dominated by men and the rest by women. the majority of graduates are absorbed by PT. SPIL as much as 25% followed by PT. Wintermar san PT. PNTS of 9.4% then by PT. Lumoso Pratama Line at 12.5%, PT. Samudera Indonesia, PT. Sowohi Keniti Jaya, PT. Arpeni Pratama Ocean Line 6.3%, and the rest by PT. Main Marine Equinox, PT. Pertamina Persero Tbk, PT. Golden Fighter, PT. Sinarmas Lda Maritime, PT. Jagad Samudera Perkasa by 1.31%.

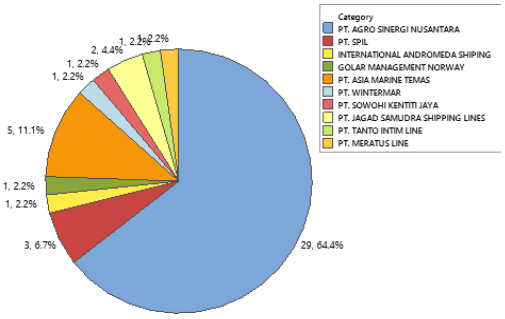

Figure 5. Pie Chart The Absorbency of ETO graduates by Companies in 2021

In 2021, of the 44 ETO graduates, 79.5% were dominated by men, and the remaining 20.5% were women. In the same year, ETO graduates were dominated by PT. Agro Sinergi Nusantara with an absorption capacity of 64.44%. Based on existing data, ETO graduates who come from the Surabaya Shipping Polytechnic Agency only have 3 months at the earliest after graduation to get a job. This proves that the absorption capacity of ETO graduates is quite high and can be identified as one

of the graduates with competitive advantage and contributes to industrial linkage. The following is the overall distribution of ETO graduates from 2016-2021.

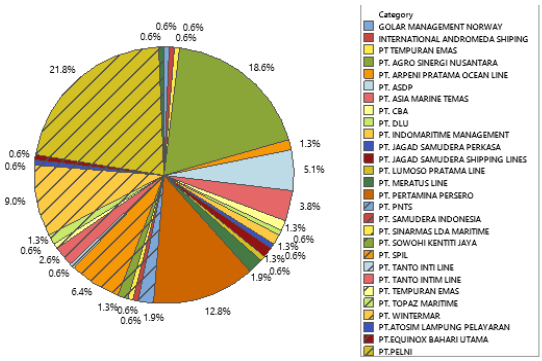

Figure 6. Absorption of ETO graduates in Industrial Linkage from 2016-2021

3.2 ETO Competency Level and The Role of Agencies in Operations Management Strategy towards the Quality of ETO Graduates

Graduates of the ETO Diploma III Study Program have a greater concentration in the world of work, so it is very much needed for graduates from the Electrical Shipping Study Program from various fields at sea and on land. The ETO Study Program also has a program or curriculum that must be designed based on its relevance to the objectives, scope and depth of the material, organizing that encourages the formation of hard skills and personality and behavioral skills (soft skills) that can be applied in various situations and conditions. The curriculum used by the ETO Study Program every year is the same as the years before which started from 2013.

The curriculum used at Politeknik Pelayaran Surabaya for the ETO Diploma III Study Program is in accordance with the 1978 STCW 2010 amendments to regulation III/6 and Code section A-III/6 ETO competencies, and based on IMO Model Course 7.08. The 2013-2017 curriculum is prepared based on the vision and mission, goals, objectives, input from alumni who have worked on the ship even with different study programs and also based on the needs of related stakeholders.

Through this curriculum, it is hoped that it can produce link and match graduates and master theoretical and practical concepts in the field of Electrical Sailing in accordance with industrial needs. The ETO Study Program also regularly shares knowledge and monitors in various activities to improve the quality of graduation.

Budget planning and fund management are carried out centrally by the Financial Management Planning Section of Poltekpel Surabaya and are directly responsible to the Director of Poltekpel Surabaya. In the preparation of the Work Plan and Budget of the Ministry of State / Institution refers to the Regulation of the Minister of Finance of the Republic of Indonesia Number 143 / PMK.02 / 2015 concerning Guidelines for the Preparation and Review of Work and Budget Plans of the Ministry of State / institutions and Ratification of the List of Budget Implementation Fills. Stages carried out in the preparation of RKAKL Polteknik Pelayaran Surabaya in accordance with the SOP for Budget / Activity Planning (RKA-KL).

The ETO Study Program conducts research that is carried out periodically and collaborates with lecturers and Cadet. In research activities, sources of financing are obtained from institutions with future development expected to receive grants from DIKTI and from stakeholder. In addition to research activities, lecturers of the ETO Study Program also carry out community service activities that also collaborate with stakeholders.

The commitment of Polteknik Pelayaran Surabaya is to improve the quality of management through the implementation of the ISO 9001: 2015 quality management system which is integrated in the internal quality assurance system of SPMI PT. Quality improvement methods are carried out through efforts, among others:

a) Improving standards (SOPs), quality guidelines and procedures by taking into account the development of the Higher Education Quality Assurance System (SPM-PT), for example by implementing a quality management system guided by ISO 9001: 2008 which is integrated with SPMI;
b) Organizing Comparative Studies to Universities that have superior quality;
c) Attend periodic consultations or discussions or trainings for continuous improvement.

These efforts are carried out to improve the quality of quality assurance and accreditation at the Polteknik Pelayaran Surabaya. It is hoped that with systematic management strategy planning in quality assurance, it can improve the quality of performance in a real way and implementers can contribute to deliverable value to students of the ETO Study Program. With this increased awareness, it is hoped that it can minimize the occurrence of failures in the process that have an impact on quality.

In order for the quality assurance strategy to be implemented properly, standards are needed that must be set and implemented and monitored regularly through internal quality audits to maintain and improve academic quality and also need to be benchmarked with universities that have superior quality either directly or through site searches to similar universities.

Thus, in quality assurance, Polteknik Pelayaran Surabaya has formulated quality standards that are used as guidelines by interested parties in accordance with the applicable organizational structure and in accordance with the standard quality cycle that can be learned through the issuance of Academic Policies, Academic Standards, Academic Regulations, Quality Manuals, Procedure Manuals, Study Program Specifications (Curriculum, Curriculum Map, Graduate Competencies), Work Instructions and Supporting Documents. Graduates have competencies in accordance with STCW Reg III/6 & STCW Code Section A- III/6.

1. Electrical, electronic and control engineering at the operation level
2. Maintenance and repair at the operation level
3. Controlling the operation of the ship and care for persons on board at the operation level

Based on the overall curriculum organized by the Polteknik Pelayaran Surabaya, it is hoped that ETO graduates have a fairly high quality and are able to compete in the world of work so that they have a fairly high absorption capacity in companies or agencies. Based on the results of descriptive statistical analysis through data from the Polteknik Pelayaran Surabaya, it can be seen that ETO graduates have an average GPA of 3,276 with a low variance rate of 0.0158 and a minimum GPA of 3.04 and a maximum score of 3.68. Based on Figure 7. and Figure 8. it can be known that ETO graduates have a GPA score that is above 3.00 where the highest score winner is the outlier point of 3.68. It can also be known that the variance for GPA values is quite low, this is indicated by the shape of the histogram which tends to purse indicating that the data has homogeneous properties.

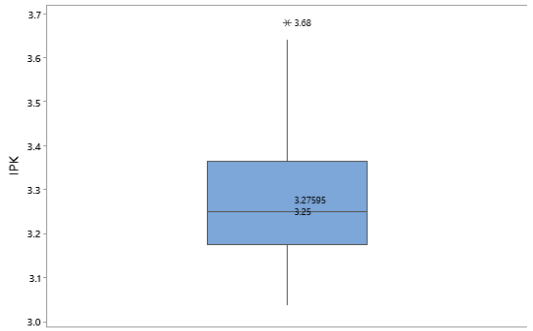

Figure 7. Boxplot GPA of ETO Graduates at Politeknik Pelayaran Surabaya

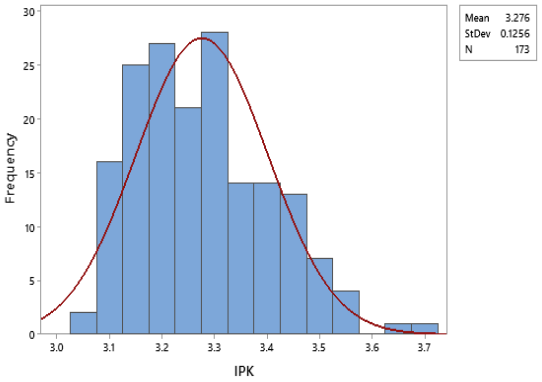

Figure 8. Histogram of GPA of ETO Graduates at Politeknik Pelayaran Surabaya

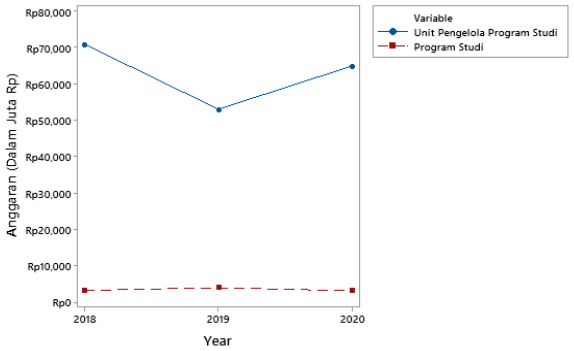

Figure 9. Histogram of GPA of ETO Graduates at Politeknik Pelayaran Surabaya

Budget allocation in 2018 (unit managing study programs and study programs) the use of the most used budget for Educators & Education Personnel Costs, Learning Operational Costs (Consumable Materials and Equipment), Indirect Operational Costs (Electricity, Gas, Water, Building Maintenance, Facilities Maintenance, Telecommunications, Consumption, Taxes, Insurance, etc.) and Student operational costs (reasoning, interests, talents, and welfare) are 67% then followed by HR Investment Costs, Facilities Investment Costs, Infrastructure Investment Costs of 32% and Research Costs and PKM Costs of 2%.

Budget allocation in 2019 (unit managing study programs and study programs) the use of the

most widely used budget for Educators & Education Personnel Costs, Learning Operational Costs (Consumable Materials and Equipment), Indirect Operational Costs (Electricity, Gas, Water, Building Maintenance, Facilities Maintenance,Telecommunications, Consumption, Taxes, Insurance, etc.) and Student operational costs (reasoning, interests, talents, and welfare) are 77% then followed by HR Investment Costs, Facilities Investment Costs, Infrastructure Investment Costs of 22% and Research Costs and PKM Costs of 2%.

Budget allocation in 2020 (study program and study program management unit) the use of the most widely used budget for Educator & Education Personnel Costs, Learning Operational Costs (Consumable Materials and Equipment), Indirect Operational Costs (Electricity, Gas, Water, Building Maintenance, Facilities Maintenance,Telecommunications, Consumption, Taxes, Insurance, etc.) and Student operational costs (reasoning, interests, talents, and welfare) which is 61% then followed by HR Investment Costs, Facilities Investment Costs, Infrastructure Investment Costs of 37% and Research Costs and PKM Costs of 2%.

4. Conclusion

Based on the results of the analysis, it can be concluded that in Strategy and Operations Management, Politeknik Pelayaran Surabaya has made efforts to improve the quality of education for ETO graduates, this is reflected in the proportion of nod allocations issued annually, the provision of adequate facilities and infrastructure, the evaluation of the performance and quality of teaching lecturers and educators periodically, the preparation of curriculum and implementation in the form of textbooks and interaction of teaching patterns with students and the existence of quality assurance. This success is reflected by the high absorption of ETO graduates at the Surabaya shipping polytechnic every year where most ETO graduates have been accepted for work within 1-3 months after graduation.

The advice that can be given by the author for the Surabaya Shipping Polytechnic agency that has potential in the ETO Diploma III Study Program is to open additional classes, considering the current conditions in Indonesian Shipping for ETO graduates are demand over supply. In addition, institutions can collaborate with potential stakeholders, especially in the field of Industrial Linkage, to raise awareness about the ETO diploma III study program and add branding value for these graduates. The implementation of scholarships is also highly recommended to improve the quality and selling point for ETO graduates.

5. Acknowledgment

A word of gratitude to the Director of the Surabaya Shipping Polytechnic along with the Deputy Director of the Directorate, Head of Academic Administration and Civil Service, Quality Assurance Unit, Head of the Shipping Electrical Study Program and colleagues.

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