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IMPACT ANALYSIS ON IMPLEMENTATION OF ONBOARD TRAINING MONITORING BASED ON MOBILE APPLICATION

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ABSTRACT

The existence of a practical learning model is a requirement for prospective merchant marine students in an effort to develop their experience dealing directly with the world of work. Merchant Marine Polytechnic Malahayati requires cadets to carry out Onboard Training (Prala) in their educational syllabus. However, the role of educational institutions in monitoring the activities of cadets when practicing outside the campus is currently a bit neglected. This can be caused by several factors, including the absence of tools/or instruments that can monitor the activities of cadets directly. Previous research on the development of a mobile-based application prototype to monitor the performance of cadets in Prala activities became one of the instruments for improving the education sector. This follow-up research uses quantitative methods and R&D research method to approach the solution to the problems obtained based on the implementation objectives. The final goal of the research is the availability of an impact analysis from the information database on the application of digitizing prala activities through a mobile-based application prototype. The results of this analysis can be used by policy makers at the Malahayati Poytechnic of Merchant Marine in developing a better education monitoring system outside the collage in the future.

Keywords: onboard training, smart school, online monitoring, merchant marine

1. Introduction

The integrated educational model is becoming a high research growth in recent days. The growths influenced by many technological advances is transforming the way in collaboration between students, teachers and education environments increasingly not only in common school but also in vocational school. The condition also supported by the fact that since 2018, the percentage of schools using internet facilities by education level and school keep growing (Figure 1).

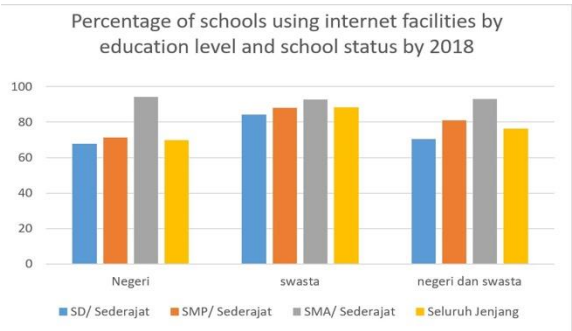

Figure 1. Percentage of schools using internet facilities by education level and school

The data came from a research in 2018, Indonesian students occupy the highest rank globally as IT/computer room users 40% in schools. They are also ranked as the second highest in the world in the use of desktop computers (54\%), after the United States[2]. With the growth of technological advanced, education is being instrumented, interconnected and embedded with smart system. Online learning, collaboration learning, learning analytics and smart school are some of learning models that taking a part in recent education development[2].

Malahayati Polytechnic of Merchant Marine, also known as Politeknik Pelayaran Malahayati (Poltekpel Malahayati) is one of many vocational university in development of integrated technology model in their education system. As a vocational university, Poltekpel Malahayati requires all cadets to carry out learning activities in class and on board ships (marine practice). The marine practice or Onboard Training is an educational activity outside the campus by participating in national and international sailing, as standardized by STCW 95 (regulation II/I and regulation III/I) [3][4]. The existence of a practical education model is very important for prospective

merchant ship officer it can not be separated from educational and training. Onboard training is delivered to provide opportunities for them to gain hands-on experience which the basic idea of direct learning based on experience will encourage them to reflect on these experiences when they have jumped directly as a professional or ship officer.

Malahayati polytechnic of Merchant Marine is improving their education system by doing many researches in advanced and applied technology. On of them is implementing online monitoring on the marine practice or Onboard Training. In 2019, the research started by build a prototype of mobile application based on onboard training model[3]. The research ended with concept, purposed design and tested with black box testing model. This research is continuing by doing impact analysis on implemented the application. This impact analysis research is considered necessary, because it will increase its relevance for the development of a better model in the future and also develop a better outside campus learning monitoring model. This research tries to explore the various problem during implementation onboard training monitoring application. The problems identified by looking at important point in entering information and assignment, information sharing and submitted proper and required document. The identification result will be collected using some quistioners and analyzed by quantitative method. The main expected result from this research is reducing the knowledge gap between direct practice on board and the knowledge provided on campus and provide a recommendation for improvement. The main objective of this research is to find the impact of applying online monitoring for student during their education time outside the campus.

This paper consists of five main parts or sections. The first section is discussed about the introduction to the research with main idea of the reasons of study. The Second section is discussed the identified problems with some related works. The third sections is talking about the methodology of research while the fourth section in becoming the result's discussion, and the last section will be discussed about conclusion of this research.

2. Problems Identification & Related Works

An impact analysis in education can be described as a step-by-step process for determining the potential positive and negative consequences of a decision made by university policy maker. Identifying the potential implications of a decision or change, helps Regulator make informed decisions and enact contingency plans before the problems arise. In addition, it allows university to consider modifications that could improve the quality of the education level. In practice, an impact analysis is a detailed study of business activities that can reveal how a disruptive event could impact products and services [1]. Conducting an impact analysis is standard in the field of software development. Due to the complexity of software products, a single change to the software could initiate a potentially devastating domino effect, rendering the software unusable[1][6]. Before making a change to the software, engineers perform an impact analysis to estimate any potential pitfalls of their decisions. Although an impact analysis is standard in software engineering, researchers can apply its principles and practices to many environments.

Research in area of mobile application is already conducted by many researchers. In the previous research, the main issue researched is located at domain of monitoring during the onboard training while students are outside the campus[3]. Cadets are prepared with some documents and tasked with a Training Record Book(TRB). The book is manually filled in by cadets while on the ship and must be submitted to supervisors on campus when they finish onboard training. This process is prone to manipulation of data because it is not inputted or submitted in real time. The research purposed to solve this real-time monitoring problem. Aspect of global impact discussed by Mazumder (2018), where the research mentioned that There is a global positive impact of mobile application[7]. Using mobile application developed country are becoming facilitate and people, society of developing country are upgrading themselves and making a new type of IT infrastructure[7]. This research also discussed historical development of mobile application from past to current era and also discuss about growth of users in occupation the mobile application. Another research discussed about Mobile devices being backed by various operating systems and development platforms have posed a challenge in building applications in terms of various aspects like development cost, development technology, skilled people, learning curve of the developers etc[8].

3. Research Mothodology

Modern science has produced many disciplines and efficiently accumulated knowledge. Each

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discipline is complete and systematic but the relationship between disciplines is not systematic because their origins are intuitive [8][9]. In previous research, mobile application protoype developed using Research and Development (R&D) approach. The term R&D is widely linked to innovation both in the corporate and government sectors. R&D allows or researher to stay ahead of his concept. Without an R&D program, a researcher may have to rely on other ways to innovate such as engaging in some features. Through R&D, researchers can design new products and improve their existing offerings. There are ten proposed steps in conducting Research and Development R&D Method. R&D methodologists in educational research are obligatory to generate effective and efficient products or services related to pedagogical or educational practices. This method develops or designs the proposed models for educational practices in some steps.

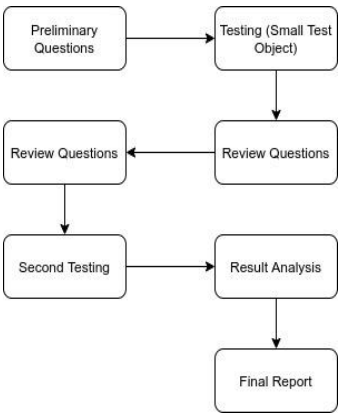

Figure 2. Research Workflow

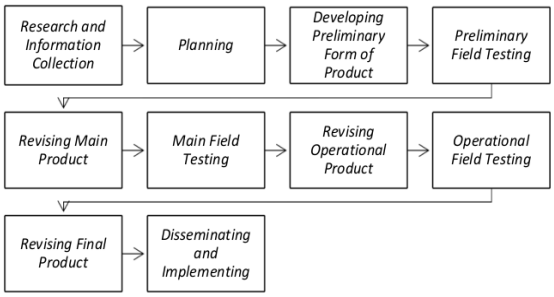

Figure 3. R&D Method Steps (Borg & Gall, 1983)[10]

Based on R&D method above, this research elaborate the steps in testing process to obtain the impact analysis. The workflow of research is:

The research started from describing preliminary question related to current situation and tested it to small amount of students. The step helps to generate more correct and comprehensive in the next testing. In the next testing, the research have more questions and ready to test it in more amount of students. The questions delivered using Google Form for easiest way to generate the analysis.

4. Results and Discussion

One part of the development of education on the smart school concept is the integration with technology as mentioned in the introduction section. In the case of Malahayati Polytechnic of Merchant Marine (MPMM), the presence of cadets on campus for 24 hours must be monitored by teachers or person in charge. This supervision standard can also be used as part of the development of a smart school model based on technology service system engineering as shown in the following figure 4:

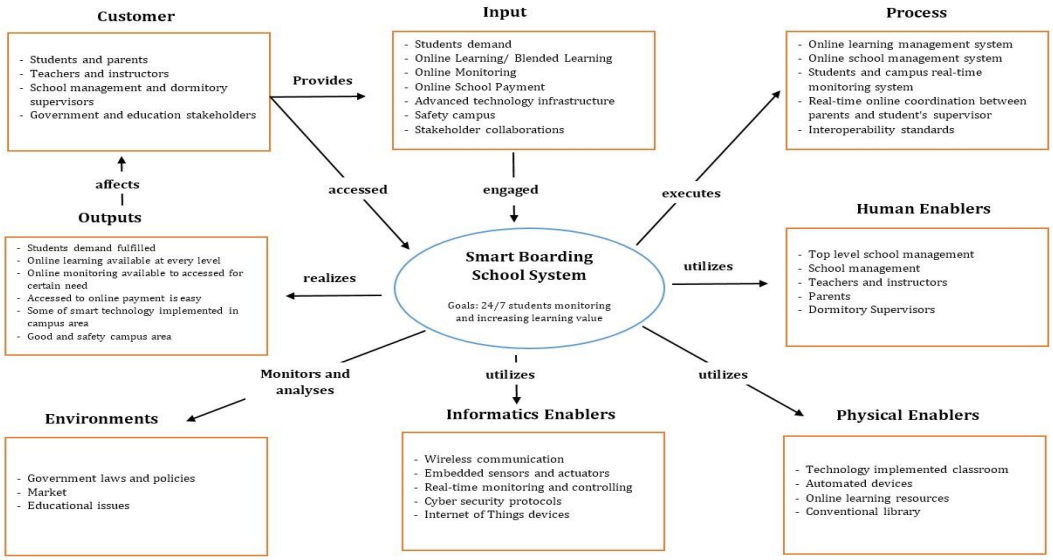

Figure 4. Smart Boarding School Model[2]

Smart boarding school system approach from Figure 4 above, deliver some conditions must be fullfiled to implement integration technology in education system. In this study, 3 important points that become references and a necessity are the informatics enablers, human enablers and process sections. From the three points mentioned above, only then can we reduce it to the development of an application-based monitoring system that can be accessed by users, which in this case is the cadets.

There are some problems during onboard training from prospective of ship officer in MPMM. The problem appears from the start until the end of process. The process taking too long to complete and it could be reduce by using technology. In focused of monitoring cases during onboard process, there are some of the problems was identified[3]:

1. The problems encountered in the application of cadet's onboard training.
2. There is no solution for monitoring the routine activities of cadets for a long time during the onboard training process.
3. Integration of information technology systems with the world of maritime education in welcoming the industry 5.0.
4. Lack of information of current maritime industrial or ship industry.
5. Lack of preparation before onboard training, whether it preparations made by the campus or those prepared by cadets.

We analyze current condition related to problem appeared by conducting questioners to from more than 90 respondents that contained current student that already onboard training and some cadets are waiting for call. Based on collected data, we assumed some important information as display at figure 5.

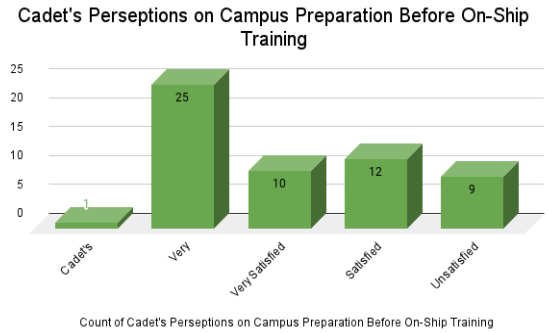

Figure 5. Cadet preception on campus preparation before onboard training

From the figure 5, we conclude that there are still many problems in the preparation of cadets to carry out onboard training activities. This is due to many things, including ineffective learning conditions on campus, lack of direct practice opportunities on ships, the competence of the instructors, the complexity of learning activities and other things. The results of the analysis in the figure 5 above also provide input to policy makers to improve the education system which has an impact on the readiness of cadets before

onboard training which is very important because the it take process lasts up to 6 months. As mentioned before, the main objective of this research is to find the impact of applying online monitoring for student during their education time outside the campus. The flowchart of mobile application process is described in Figure 6 below. Every cadets have to register himself trough application. After registration, cadets will be asked to enter the legal document for registering their status onboard and validate by school administration at university. During onboard training, they will provided with some questions that have to be fullfiledin application and they also get instructions about their assignments. School administrators at Malahayati Polytechnicof Merchant Marine also have an important role in the implementation of this system. Their presence in monitoring the activities of cadets during onboard training through a monitoring system is part of the success of the system being built. School administrators at the completion of the cadet onboard training activity stages can collect final data on the results of the activities before they are submitted to policy makers.

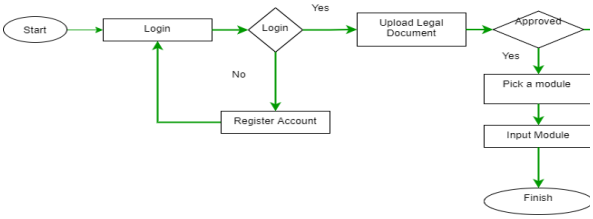

Figure 6. Activity Diagram of Application

Satisfaction level conducted from respondents after testing the application and solved some problem. The level of satisfaction based on problems solved can be seen on table 1 below:

Table 1. Application Features and Cadets Satisfaction Level

No.	Features	Problems	Descriptions	Satisfaction (%)
1.	Login & Register	Problems Complicated registration process	This features targeted to simplifying registration flow from beginning onboard training. Information students will be collected and saved in the database.	90%
2.	Upload Legal Document	Identifying registered student at the ship company, Identifying valid/ legal ship company	Important to register every ship company in order to facilitate the campus for the next training	85.7%
3.	Tasks/ assignments	Information manipulation/ invalid assignment submission after training	Collection assignment from students during onboard training	83.5%
4.	Guidance	Instruction for assignments or important information not delivered to the students	Consist of guidance for every assignment related and instruction of Training Record Book(TRB)	77%

Based on Table 1 above, we obtain that basic login and register process as application basic feature is getting the highest satisfaction score with 90%. The score probably caused by the basic features that usual used by every of us when login to an application. In Uploading legal document feature, respondents provide 85.7% satisfaction score and 83.5% satisfaction score for assignment features. The last one is the lowest satisfaction score given by respondents with 77%. This condition is because this section does not discuss the instructions in full and still requires further and more detailed development.

Beside conducted some satisfaction level, the research also provided cadets impression of implementing online monitoring. The respondents hope the system will be delivered and actively used by every cadets in the next phase of onboard training. The impression of respondents can be figure at chart below:

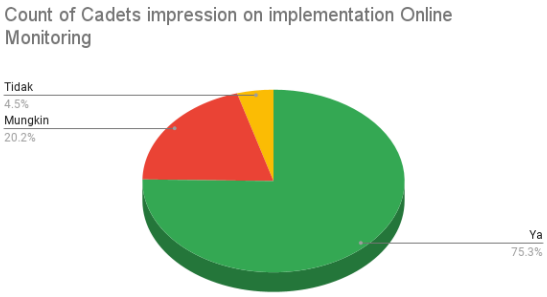

Figure 7. Count of Respondents with positif impression to the implementation of online monitoring

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