Design and Implementation of Self-Test Learning Application to Increase Competence

Yuyun Suprapto[1',*], Moch. Rifai[2], Ariyono Setiawan[3], Meita Maharani S[4]

[1,2,4] *Department of Air Navigation Engineering*
[3] *Department of Air Transport Management*
[1,2,3,4] *Politeknik Penerbangan Surabaya, Indonesia*
*corresponding author. Email: yuyunatkpsby@gmail.com

ABSTRACT

The purpose of this study is to find how the environmental shift of learning with the development of information technology, online study during *coronavirus disease (*COVID-19). Changes in information technology have affected learning strategies, learning environments, improved information technology capabilities for teachers and students. The analysis of this study is a qualitative descriptive. The result showed information technology displace the tendency to learn face-to-face. Where the object of this study is the teacher at Surabaya Aviation Polytechnic that was vocational education with the boarding school system. This system applies the rules of learning in campus and dorms. In the pandemic condition students move to online learning at home where information technology and self-management are needed. This situation encourages teachers to be able to use information technology as learning medium for student learning success. This study says that teachers, students and the Surabaya Aviation Polytechnic have a different role from before to adapt the learning environmental change. More focused, the design of learning allows many models, methods, media in the online learning system to facilitate study at home. The research implies is a change in learning environment due to knowledge of information technology, online learning during COVID-19.

Keywords: self-test learning, multimedia development life cycle, information and communication technology, vocational education

1. INTRODUCTION

The current condition is an unplanned condition because the world is experiencing the Covid 19 pandemic era, including in Indonesia. The spread of the corona virus initially had a huge impact on the economic world which was starting to sluggish, but now the impact is also being felt by the world of education. Minister Nadiem Anwar Makarim issued Circular Letter Number 3 of 2020 to the Education Unit and Number 36962 / MPK.A / HK / 2020 concerning the Implementation of Education in the Emergency Coronavirus Disease (COVID-19) so learning activities are carried out online in the context of prevention the spread of coronavirus disease (COVID0-19). With this condition, the learning process cannot be done face-to-face in class. Learning Learning is a major focus of research in psychology, neuroscience, behavioral ecology, evolutionary theory, and computer science, as well as in many other disciplines [1] However, this situation did not last long. Innovation and creativity must go hand in hand with the flow of globalization which has an impact on technological progress. Technological advances cover all aspects of life including education. Advances in technology in education, where educators are important, it is necessary to have an understanding of methods, techniques and media that can be applied to foster student interest in independent learning and increase creativity for learning. Teaching skills are encouragement to pay attention to the things that will contribute to effective teaching and learning and replace traditional methods of exposing teachers to classroom teaching which lead to isolation of these teacher behaviors [2]. Educational media is commonly defined as tool, method, and technique used in order to further make the communication and interaction between lecturers and students in the process of education and teaching more effective [3]. Educational media that are well designed will greatly help students digest and understand the subject matter. education medias are widely used in all educational levels, it should be known that vocational education needs both academic and practical approaches. Each approach requires different instructional design frameworks. [4]

The method used in this research is the Multimedia Development Life Cycle (MDLC) method. Through the multimedia learning method, students can learn independently about learning material, practice working on questions to find out their abilities without having to meet face to face. This method should be able to make online learning done by students at home more optimal. Teacher creativity in learning is very influential on student understanding because the more creative teachers are in delivering material, the easier it is for students to understand the lesson and make students more creative in learning as well [5]. Learning media is an element or component of the learning system, so learning media is an integral part of learning.

The learning process is actually dominated by information management activities. There are three main components in information, namely users, access and information. In the learning process as users are students, as information is learning material that comes from books, computer databases, knowledge bases or other sources of information. While access is the transfer of information from information sources to students. In computer-based technology, it examines how to design learning by utilizing computer resources, including user settings, learning information settings and access settings.

Learning problems are special problems experienced by students and the process carried out by individuals to get behavior change. The teacher's barriers to student learning activities in class are the learning media in learning and the number of students in the class. The purpose of this study was to design a "Self-Test Learning" application or so-called STL where students were able to test themselves as both summative and formative tests as a reference for their readiness to face the exam. The application of the STL application is also to improve learning outcomes and independence at the Surabaya Aviation Polytechnic. Surabaya Aviation Polytechnic is a vocational education with a boarding school system. Vocational / vocational education as part of the national education system plays a very strategic role in the creation of a skilled workforce [6]. Boarding School is a boarding school system, where students as well as teachers and school administrators live in a dormitory within the school environment for a certain period of time[7]. Even when cadets get fewer scores, a retest will be carried out, and if they don't can increase it can be issued. From the background that has been presented, the author tries to design and implement the "Self Test Learning" application to increase the independence and competence of Surabaya Aviation Polytechnic students. . The purpose of this study was to determine the shift in the learning environment due to knowledge of information technology, online learning during the Covid 19 pandemic.

2. METHOD

Factors that can influence students' learning activities are two types: internal factors and external factors. Internal factors, such as attitudes towards learning, learning motivation for students, student learning habits, student confidence, learning style and student ideas. External factors that can affect student activities, such as teacher as a student in the learning process of teaching, facilities and infrastructure, school student environment, assessment policy, and school curriculum. In handling changes in learning conditions at Surabaya Aviation Polytechnic today, teachers have an important role in maximizing the technological knowledge that makes students have knowledge and skills.

This research will apply self-test learning (STL) application tested on Students of Surabaya Aviation Polytechnic. The design is defined as drawing, planning, and sketching or setting from several separate elements of one functioning unit. The understanding of the application is the use or application of concepts that are the material of discussion. Applications can also be interpreted as computer programs created to assist humans in performing certain tasks [8]. Self-Test Learning (STL) is our ability to evaluate learning independently, and can also be interpreted as a plan implemented to carry out a learning evaluation of ourselves. The design of this STL application uses multimedia development life cycle (MDLC) method consisting of 6 (six) stages, namely:

2.1 Concept

The concept stage is the stage to determine application goals (entertainment, training, learning, etc.), types of applications (presentations, interactive, etc.), and who the program users are (audience identification). The concept of this application system can be seen in Figure 1.
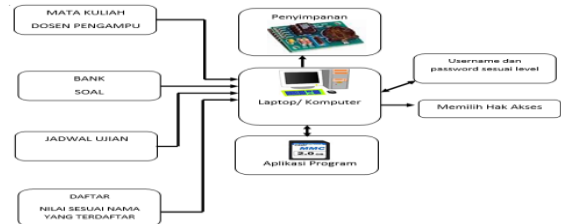

Figure 1. STL Aplication Design Concepts

2.2 Design

Design is the stage of making specifications regarding program architecture, style, appearance and material requirements for the program. The design of this application system can be seen in Figure 2.
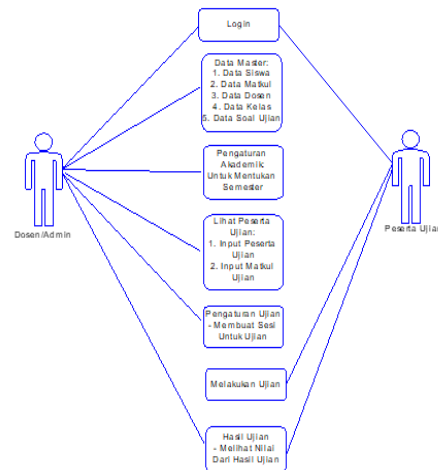

Figure 2. STL Application Design

2.3 Material Collecting

Material collecting is a component collection stage that suits your needs. This stage can be done in parallel with the assembly stage. But in some cases, the Material Collecting stage and the Assembly stage will be done in a non-parallel fashion. The design of the STL application is a test system application using the Xampp database using the php program language and coding using Dreamweaver [9]. Collection of components in the application system can be seen in Figure 3.

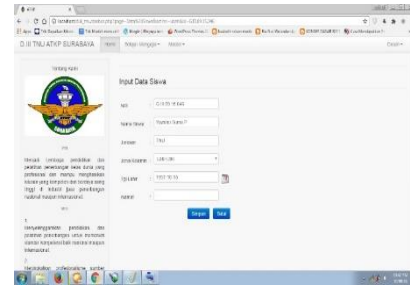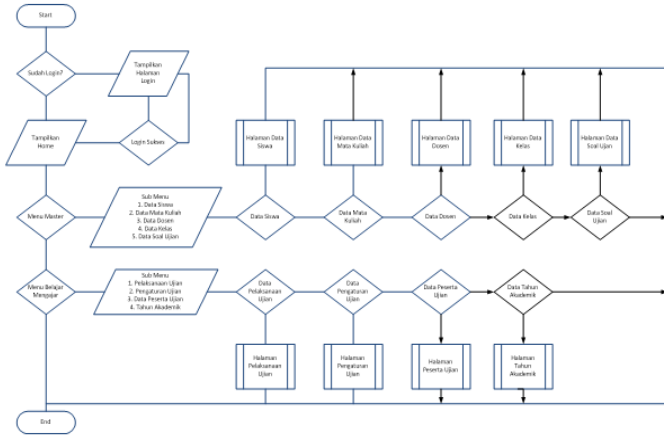**Figure 3.** Diagram of Componen Assembly Flow

2.4 Assembly

The assembly stage is the stage where all multimedia objects or materials are created. Making an application is based on the design stage. Making it on this application system can be seen in Figure 4.
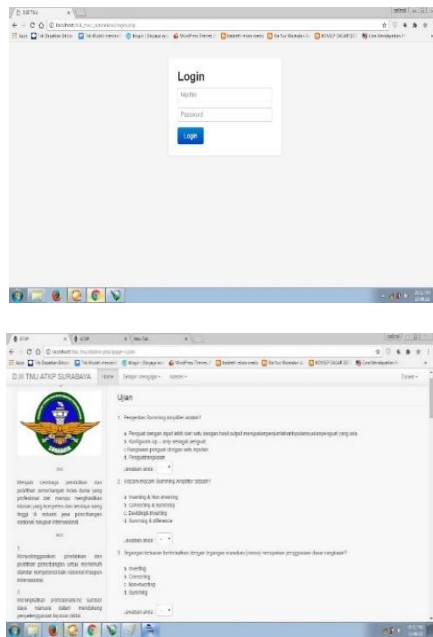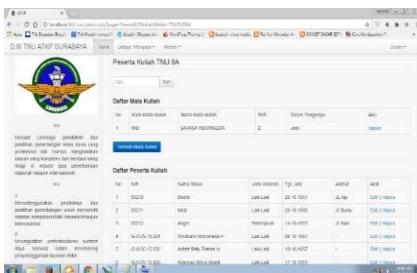

Figure 4. Making STL Aplication

2.5 Testing

Performed after completing the manufacturing phase (assembly) by running the application or program and see whether there are errors or not. This stage is carried out by the maker or the maker itself. Testing in this application can be seen in Figure 5.

Figure 5. Testing STL Appplications

2.6 Distribution

The stage where the application is stored in a storage media. At this stage if there is not enough storage media to accommodate the application, then the application will be compressed. Submission to this application can be seen in Figure 6.

Figure 6. Display the STL Home Application

The design of STL applications in accordance with the above MDLC method has been completed until the distribution on the "HOME" display above. The results of the collection of questions in accordance with the Semester Learning Plan (RPS) are implemented to students. Education is the most basic requirement every human being must-have, with human education being better able to develop the potential within him. Education also as a process in certain ways so that one gets the knowledge, understanding, and the appropriate behavior [10].

3. RESULTS AND DISCUSSION

The design with 6 stages starting from Concept, Design, Material Collection, Assembly, Testing, and Distribution in the MDLC method [9] has been carried out in accordance with Chapter 2 (two). Then the next stage is the implementation of Telecommunication Engineering Study Program students with the Solid State Electronics course, Surabaya Aviation Polytechnic. The implementation of this test was carried out

using paper and when using the "Self Test Learning" application, an increase in the average score of the test was found. It can be seen in table 1. Table 1 shows an increase in the lowest and highest scores when using the STL application. This STL improves student competence as seen from a significant increase in grades. This increase shows the readiness of students in facing exams. There are still many affective assessments carried out by teachers who have not used assessment principles under the guidance in affective assessment so that the affective assessment model is made according to the instructions of the affective instrument [10].

Table 1. Increased Value In Stl Application

Learning Media	Mean	MAX (highest value)	MIN (lowest value)
Self Test Learning (STL)	8,82	9,44	7,74
Test Based Paper (TBP)	7,55	8,05	6,2
Percentase (%)	16,82	17,27	24,84

4. CONCLUSION

The "Self Test Learning" application design is a more controlled Test System Application using the Xampp database. This "Self Test Learning" application modul design is a Test System Application that is more controlled using the php program language and coding using Dreamweaver. The system created can help or replace the manual exams conducted at Surabaya Aviation Polytechnic. This application is expected to increase independence and learning outcomes. The use of the Self Test Learning module application system requires socialization and technical guidance in use. By providing a more independent Test learning concept according to self-evaluation. Thus the role of the Lecturer becomes very important in order to provide a question bank in accordance with the syllabus and Semester Learning Plan. Need to be tested with many scenarios in accordance with other learning needs, for example learning content, communication interactions, and discussion of questions. This system is expected to be improved in the mobile learning application.

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