E-AVIATION LAW MODUL FOR AVIATION VOCATION SCHOOL

Nilam Sekar Gading*, Fatmawati, Putu Agus Valguna

Politeknik Penerbangan Surabaya, Jalan Jemur Andayani I No 73, Kota Surabaya, 60236
Corresponding Author. Email: gadingsekar27@poltekbangsby.ac.id

Abstract

Aviation Law is one of the courses in the Aeronautical Communication Diploma 3 Study Program that studies national and international aviation regulations, which aims to enable cadets to explain the regulations that apply nationally and internationally in the work area to guide aviation communication in all classifications of airspace in aviation. In the development of information and communication technology in Indonesia, educational learning media through applications or websites that make learning activities more interesting, effective and efficient. At this time, learning Aviation Law Subjects still uses modules that are less interactive referenced documents so that cadets quickly feel bored and less interested in carrying out learning. So in this industrial revolution 4.0 to realize effective and enjoyable learning, the author suggests making e-modules. In this study using the type of research and with the Waterfall method.

The results of this research are E-modules of Aviation Law in the form of flipbooks and mastery tests contained in each topic of discussion which are equipped with images, video, and sound that have been adjusted to the academic syllabus and implemented on the Learning Management System (LMS) in Aviation Polytechnic of Surabaya. The author's goal in this final project is to design and create e-aviation law modules as new interesting and innovative learning media that can help in aviation law learning

Keywords: Learning Management System (LMS), Aviation Law, E-module.

INTRODUCTION

Aviation is a part of the national transportation system that has the characteristics of being able to move in a fast time and use technology. Therefore, to create a system that supports security and safety and remains directed requires aviation organizers in accordance with the development of science and technology. Therefore, an aviation law is needed that is in accordance with the changing conditions of the environment and the current needs of aviation operations. [1] Aviation Law is one of the courses in the Aeronautical Communication Diploma 3 Study Program that studies national and international aviation regulations, which aims to enable cadets to explain the regulations that apply nationally and internationally in the work area to guide aviation communication in all classifications of airspace in aviation. In the development of information and communication technology in Indonesia, educational learning media through applications or websites that make learning activities more interesting, effective and efficient. At this time, learning Aviation Law Subjects still uses modules that are less interactive referenced documents so that cadets quickly feel bored and less interested in carrying out learning. So in this industrial revolution 4.0 to realize effective and enjoyable

learning, the author suggests making e-modules. In this study using the type of research and with the Waterfall method.

In accordance with the Regulation of the Head of the Transportation Human Resources Development Agency Number PK. 09/BPSDM-2016 concerning the curriculum of the formation education and training program in the field of aviation, in the curriculum of the D3 Aeronautical Communication (KP) study program in semester 1 of the Working Behavior Course (MPB) there are courses in Aviation Law and International Regulations. [2] The purpose of providing this Aviation Law learning subject is for cadets to be able to explain the applicable national and international regulations that apply in their work area to carry out flight communication guide work in all classifications of airspace in aviation.

In 2020 Indonesia experienced a pandemic, namely the spread of the covid-19 virus which caused all Indonesian people to be unable to freely carry out activities outside the home. One of the impacts of this pandemic is in the field of education. [3] [4] The covid19 condition at that time hampered learning activities so that cadets could only do it virtually which caused teaching and learning activities to be less than optimal unlike face-to-face teaching and learning activities. During distance learning cadets get an explanation of the material needed online. Lecturers also

provide several aviation documents that can be used to support cadets' knowledge and references. However, these teaching and learning activities are less than optimal because the explanation given verbally and because only reading from documents makes cadets less absorb the material provided because the material provided is less interesting and cadets become bored faster. [5]

Along with the development of Information and Communication Technology (ICT) in Indonesia occurs in various aspects of life, one of which is education, especially websites that can be accessed anywhere and anytime, and almost all people can operate it and can help in the teaching and learning process which can improve the quality of education in the environment. And also in line with UU-SISDIKNAS Number 20 of 2003 CHAPTER VI Article 31, concerning pathways, levels and types of education, which contains that distance education functions to provide educational services for community groups who cannot attend faceto-face or regular education. [6] So in the industrial revolution 4.0, a learning system using e-modules is used.

Findings from the data show that about 75% of FMIPA UNM students agree with the use of online

learning. In general, the characteristics of students in each province in Indonesia are "similar" in terms of thoughts related to online learning i.e. millennial students, and also most students are already using the internet as a primary need for learning, so this data has policy implications for higher levels. [7] The advantages of online learning include: [8] [9] [10] [11]

1. Easier to absorb, which means using multimedia facilities in the form of images, text, animation, sound, video.

2. Much more cost effective, meaning no need for instructors, no need for a minimum audience, can be anywhere, can be anytime, cheap to reproduce.

3. Much more concise, meaning there are not many class formalities, directly on the subject matter, subjects as needed.

4. Available 24 hours / day - 7 days / week, meaning that the mastery of the material depends on the enthusiasm and absorption of students, can be monitored, can be tested with e-tests.

The current aviation law course still uses modules that are less interactive referenced documents so that cadets quickly feel bored and less interested in carrying out learning. So in this industrial revolution 4.0 to realize effective and enjoyable learning, the author suggests making an e-module because the e-module can not only include theory in the form of writing but can also be in the form of images, sounds, and even learning videos, which

will help the teaching and learning process become more effective and more interesting. [12] [13] [14]

In making e-modules, researchers use the Waterfall method. The Waterfall method has advantages, namely, making which has a small risk of error, does not require continuous changes and a very clear product description. [15] This is relevant to the material that the researcher raises about the Aviation Law which has a definite syllabus but a document that must be continuously evaluated in every change in a country.

METODE

This research refers to Development Research Approach (Research and Development) method. In this study using the Waterfall development model, with the flow as shown below:
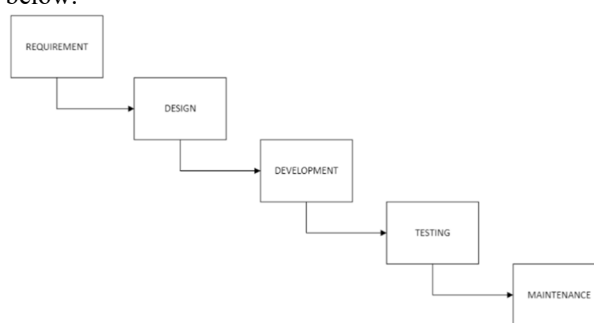

The following is a description of the stages of the Waterfall information system development method:

a. Requirements

At this stage the developer must know all the information about software needs such as the usefulness of the software desired by users and software limitations. This information is usually obtained from interviews, surveys, or discussions. After that, the information is analyzed so that it gets complete data about user needs for the software to be developed.

b. Design

The next stage is Design. It aims to provide a complete picture of what to do and how the desired system will look. So that it helps specify hardware and system requirements, as well as define the overall system architecture to be created.
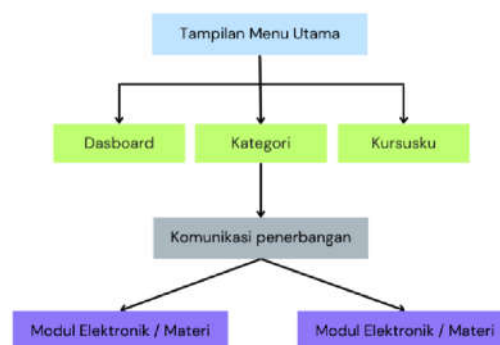
c. Development

This stage is characterized by constructing the eModule according to the design into software and verifying the specifications of each planned unit. The process of writing code is in this stage. Software creation will be broken down into small modules that will be combined in the next stage. In this stage, there will also be a deeper examination of the modules that have been made, whether they have fulfilled the desired function or not.

d. Testing

In this fourth stage, the previously created modules will be combined. After that, testing will be carried out which aims to find out whether the software is in accordance with the desired design and whether there are still errors or not.

e. Maintanance

This stage is characterized by the installation and practical use of e-Modules and the maintenance of eModule software. This maintenance is the last stage of the Waterfall development method. Here the finished software will be run or operated by its users. [16]

Requirement

To find out the needs of the product, the author conducted an interview with the lecturer teaching the Aviation Law Course. From the results of the interview, the author knows several conditions that support the author to develop this E-Module.

Desain

The initial appearance of the Aviation Law Interactive E-module cover. And will be equipped with Course Learning Outcomes from the Aviation Communication D3 curriculum syllabus of Surabaya Aviation Polytechnic.


How The Instrument Work

This flowchart explains the flow of the E-Module which is implemented on Learning Management System (LMS) Aviation Polytechnic of Surabaya.

The following are ways to access the E-learning Web Page on the user:

a. Open a web browser and access https://courses.poltekbangsby.ac.id/ in the url column at the top of the browser then press enter. You will be directed to the Surabaya Aviation Polytechnic e-learning system page to log in.

b. Click the Login button on the top right. You will be directed to the login page as shown in Figure 4.


c. Enter your Username and Password. After that press Enter or click the Login button as shown in Figure 5.

d. After successfully logging in, you will be on the Front Page of the Surabaya Aviation Polytechnic elearning. On the Home page, you can see a list of courses located in the Course Categories of the elearning website.
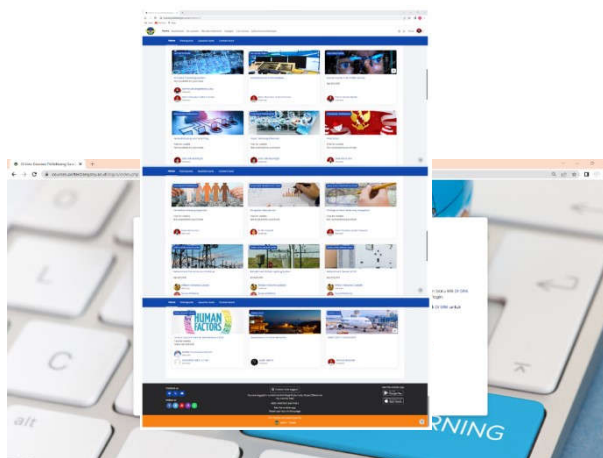

Picture 6 Display Page After Login

e. In addition, you can access the courses or courses taught in Course Categories on the Navigation panel on the left sidebar of the e-learning website page as shown in the figure 7.
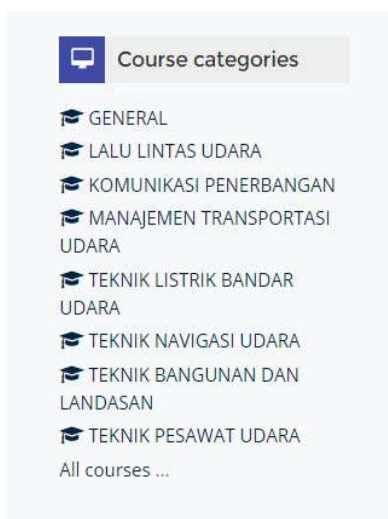
Development

In this development stage, it continues from the design stage, the first step taken in this stage is to collect the prepared material and double-check the material to collect video, audio or animation to support the material in this e-module. After all is collected, the next step is to combine all parts of the e-module using a graphic design platform and publication content in the form of canva and hayzine flipbook which is an application to convert pdf files to the back page of digital publications or digital books. Which makes the display more attractive like a book, in Figure 4.4 is the appearance of the e-module that has been developed into Hyzine flipbook.
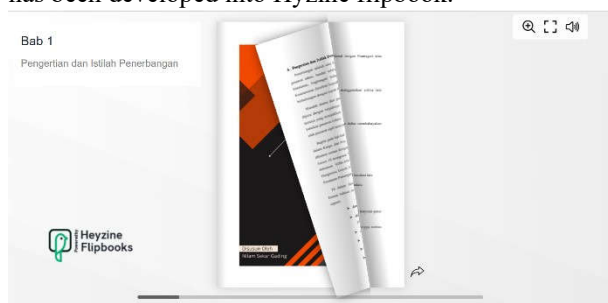

Testing

At this stage the author implements this e-module into the Learning Management System (LMS) of the Surabaya Aviation Polytechnic and validates the material to experts both material and media, to find out whether this e-module is suitable for use or not.

a.   E-module Implementation

The e-module that has been implemented using hayzine flipbook is then implemented on the Learning Management System (LMS) with the LMS link as follows https://courses.poltekbangsby.ac.id/ in Figure 4.5 is a display of the Surabaya Aviation Polytechnic LMS with the E-module of the Aviation Law course.
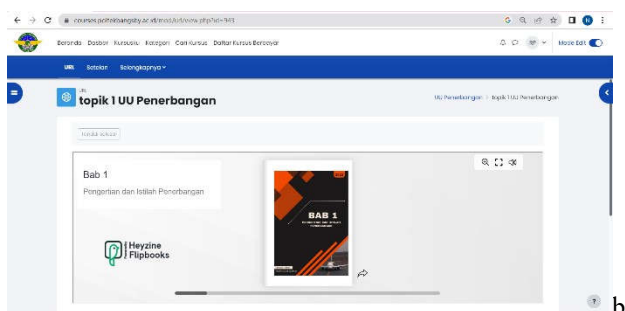
b. Validation of e-module feasibility

After this e-module was implemented on the LMS of Surabaya Aviation Polytechnic, the validation of the feasibility of this validation product was carried out by expert validators and asked for theoretical and practical considerations. Expert validators consist of material and media expert validators.

1)   Material expert validation

At this stage of material expert validation using emodules that have been implemented on the Surabaya Aviation Polytechnic LMS by lecturers teaching Aviation Law courses. Validation carried out by material experts related to aspects of the relevance of the material in the e-module, material validation in addition to assessing the feasibility of material experts also provide suggestions for improving the media. In this material expert validation stage, the author uses interview techniques to obtain opinions from material experts, with the result that the validator agrees with the e-module and is suitable for use without revision with the results of the interview for this e-module already covers the RPS of the Aviation Law Course because the Law used as a source has been updated, the e-module has provided information in accordance with existing materials and regulations, e-modules are expected to be used in all classes because when cadets work later, cadets must be able to understand the regulations in the Aviation Law, according to the lecturers of the Aviation Law Course e-modules when implemented on the Surabaya Aviation Polytechnic LMS are very useful in the future as an increase in effectiveness in self-study.

2)   Media expert validation

Media experts in validating the e-module media for Aviation Law courses use e-modules that have been implemented on the Surabaya Aviation Polytechnic LMS. The validation carried out by media experts is related to the appearance of the media, how easy it is to use the e-module and the feasibility of the e-module design displayed. In this stage the author uses interview techniques to obtain opinions from media expert validators, with the results that the validator agrees with this e-module and is suitable for use without revision with the results of the interview that this e-module is neat enough in writing and the cover page is good enough to increase the enthusiasm for learning the cadets.

Maintenance

At this stage the E-Module has been uploaded to the Surabaya Aviation Polytechnic LMS and errors or evaluations have been found that must be corrected. In this case, the evaluation obtained is that the e-modules listed or uploaded in the Surabaya Aviation Polytechnic LMS do not yet have a feature to download or download e-modules. So that users cannot open e-modules offline or without using the internet. So it is necessary to add these features so that e-modules can be studied or opened offline or online to make it easier for users to access e-modules.

RESULT AND DISCUSSION

In an interview with the lecturer as well as the material expert validator from the results was found that the Aviation Law course did not yet have an e-module to support learning. The Aviation Law E-module material is in accordance with the RPS and syllabus. It is hoped that the E-module will be able to support learning and keep up with technological developments so that users can learn independently without being limited by space and time.

In interviews with lecturers who teach basic information and technology as well as media expert validators, it was found from the results of the interview that in the era of technological development the use of e-modules can help support the learning process because they have an attractive appearance and can be equipped with videos, images or sound. from the results of the interview it was also found that the Waterfall development method has many advantages and is suitable for the development of e-modules for the Aviation Law course.

CONCLUSION

Based on the results of the design and research of the Aviation Law E-Module that has been determined, the following conclusions can be drawn:

1) The Aviation Law E-Module using the Waterfall development method is feasible to use both in terms of material and media.

2) The Waterfall development model has many advantages and is suitable for the development of Emodules for Aviation Law courses.

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