

Development of X Ray Simulator Learning Media in Junior Aviation Security Course Based on MOOCS

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Abstract: The Aviation Security course is a course that must be followed by cadets of the Diploma 3 Airport Management study program. One of the materials in the Aviation security course is Operation of security equipment which contains aviation security equipment, namely X Ray machines. An X Ray machine is a tool used by aviation security personnel to check passengers' belongings. To achieve learning objectives, varied and independent learning resources are needed that are not limited in time and place. This research is motivated by the difficulty of cadets in understanding the material in the package book and the electronic media used is still limited to power point slides. Then to be able to find out the feasibility, response of cadets, educators and lecturers, as well as the effectiveness of MOOCS learning media will be carried out in this study. This research method uses a research and development (R&D) approach which is then adjusted to the needs of researchers, research methods used to produce certain products, and tests the effectiveness of these products. Researchers conduct research first to collect the required amount of data then develop the system and conduct testing and evaluation of the system created. This research was conducted at the Politeknik Penerbangan Palembang from April 2022 to October 2022.

Keywords: Cadets, Caregiver Competencies, Character Development

A. Introduction

Today, technology is developing very rapidly. Therefore, such changes must be followed by rapid and quality processes and changes in both the process and the results of education. Quality education is expected to meet the needs of graduates who can adapt to all current challenges, especially in the digital era. The current college curriculum is the Independent Campus Learning Media (MBKM). Self-paced curricula for independent learning require institutions that connect and align the learning experiences provided to students with job opportunities. To meet the demands of this discipline, students are very likely to learn other things that are interdisciplinary and even interdisciplinary to meet the needs of the job market. These are different (interdisciplinary) learning courses. This curriculum is easy to implement if it involves a good learning process. Palembang is one of the big cities in Indonesia.

As a big city, Palembang certainly has a variety of public facilities, such as an airport. As is known, the airport is also a place that has a fairly dense routine. One of the most important efforts to improve human resources is to provide *training* both for office employees and for field officers who face passengers directly every day. The field officer in question is an Aviation Security Personnel who is in charge of Providing Protection from unlawful acts against aviation. So, it takes additional special skills to ensure safety in the aviation world. to work in the aviation security unit are personnel who have obtained a permit issued by the Directorate of Aviation Security.

In 2021, the Banten National Narcotics Agency (BNN) arrested a drug smuggling courier at Soekarno Hatta International Airport, Cengkareng Tangerang, as reported by detiknews, October 13, 2021. Banten BNN chief Hendri Marpaung said the suspect's US initials had escaped X Ray inspection at the airport, Medan. Where the suspect hid meth in 2 bags and stored in the folds of clothing. And there are still some cases that occur related to examinations carried out by officers who can still pass the examination.

In the digital era like today, the use of technology makes the learning process more interesting and less boring and can improve the quality of teaching and learning activities. Lecturers and teaching staff as facilitators are required to be able to master and apply technology-based advances. The use of interesting learning media can increase understanding of a material and can achieve maximum learning outcomes (Arsyad, 2014). Learning is a systematic and systemic process or activity, which is interactive and communicative between lecturers and cadets, learning resources and the environment to create conditions that allow students learning actions, both in the classroom and outside the classroom, physically attended by the teacher or not, to master predetermined competencies (Arifin, 2009; Azwar, 1996; Anis, et. al., 2021). In the process of implementing learning, educators are guided by learning tools that include a syllabus, Learning Implementation Plan, and evaluation (Akbar, 2013). Learning activities have interconnected components, namely educators, students, learning objectives, learning materials, learning methods, learning media and evaluation. So that learning can run effectively and efficiently.

Based on information obtained by lecturers, educators and cadets of the Airport Management Study Program in aviation security courses, researchers see that there are no 3 uses of technology-based learning media. And the use of contact persons in the learning process is not optimal. As well as in the implementation of learning activities, they are still fixated on face-to-face. So, there are limitations in learning. This results in the quality of learning being less than optimal. The development of technology and the growth of internet use in Indonesia has a positive contribution, especially in the field of utilizing internet media for learning. By using MOOCS-based learning media as an effort to support the blended learning process, it is hoped that it can minimize existing constraints (Risdianto, 2021). The use of facilities in the moo cs application can be used by students to obtain materials, do assignments and practice doing questions in the learning process. This aims to further improve students'

mastery and understanding of the material. As well as allowing learning interactions between lecturers and cadets as well as cadets anywhere and anytime so that the quality of learning is optimal. This is in line with the blended learning method that combines classroom learning and online learning.

In principle, MOOCs describe Online Courses with many open (massive) enrollments, which provide admissions administration services and in terms of content, design, access points, application methods, and the definition of success. (Busri, et. al., 2019). MOOCs also use technology diversification as a technology applied to distance learning, albeit in the scope of things that are small, traditional, and adaptable (Risdianto, et al., 2021). Teachers or lecturers are now encouraged to be proficient in elearning literacy, such as MOOCs, to apply and utilize knowledge in the 21st century world in the teaching and learning process (Ismail et al., 2018). similar research on learning with MOOCs has been conducted by Ismail et al. (2018). The results of the study show that MOOC learning is very good and can increase student interest and motivation (Risdianto et al., 2021). Another study was also conducted by Busri et al. (2019). This study concluded that learning with MOOCs is adequate for use in physics learning (Busri et al., 2019). Based on the description above, researchers will develop Junior Aviation Security material with MOOCs in Politeknik Penerbangan Palembang, in order to optimize existing learning media facilities.

B. Methods

This is the Research and Development, which is used to produce certain products, and test the effectiveness of these products (Sugiyono, 2010). This research procedure adapts the ADDIE development model, which is a development model consisting of five stages consisting of Analysis, Design, Development, Implementation and Evaluation. The ADDIE Development Research Model as the name implies is a model that involves the stages of model development with five development steps including: Analysis, Design, Development or Production, Implementation or Delivery and Evaluation). The ADDIE model was developed by Dick and Carry in 1996 to design a learning system (Yeong, et. al., 2018).

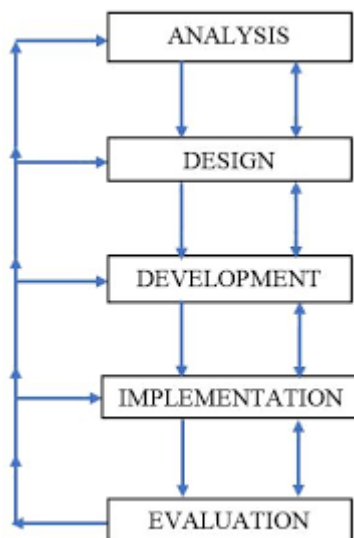


Figure 1. ADDIE Model Process

The instruments used to collect product quality data are: First, the questionnaire sheet is in the form of a check list to get an assessment from experts consisting of media experts and material experts (Arikunto, 2006; Arikunto, 2010). Aspects of the MOOCS-based learning media assessment criteria for material experts are the linguistic aspect, the material suitability aspect and the illustration aspect. Meanwhile, the aspects of the assessment criteria for media experts are the linguistic aspect, the graphic aspect, the program processing aspect and the use aspect. While the questionnaire sheet is in the form of a questionnaire which is used to obtain student response data (Septiani et al., 2020). Aspects of student response criteria collected in this study are: 1) ease of using the program, 2) display of learning media, 3) depth and content of the material, and finally 4) Media Expediency.

The score display is used to identify the feasibility level of a product resulting from development research. Decision-making criteria for validation of MOOCS-based learning media are listed in the following table.

Table 1. Feasibility Level

No	Percentage	Note
1.	80%-100%	Valid
2.	60%-79,9%	Fair
3.	50%-59,9%	Less Valid
4.	0%-49,9%	Change

C. Results and Discussion

In material analysis, the curriculum used in the development of Junior Avsec learning media is the 2019 Curriculum which was prepared at the level of the Air Transportation Human Resources Development Center (PPSDMPU) for the MBU Study Program. Based on the existing syllabus, subject matter can be identified in the Junior Aviation Security course. The scope of the course includes: Operation of Security Equipment, Profiling, Protection and Control of Access Control, Airport Contingency Plan and National Aviation Security Program. In this study, the author limited the scope to applications made only on the material of Deploying Security Equipment.

The second analysis is related to the personality of students, carried out in order to develop the right type of learning media (Amalia and Nugraha, 2021). Based on the results of the survey, students collected data to analyze the Junior Aviation Security media and students' needs for fire protection. The results of the interview show that if the material is presented in the form of animations and drawings it will be easier for students to understand the material.

The next stage is design, aiming to design the form of presentation of the application to be made. One of the product planning is the creation of a learning media flowchart.

Computer assisted instruction drill mode

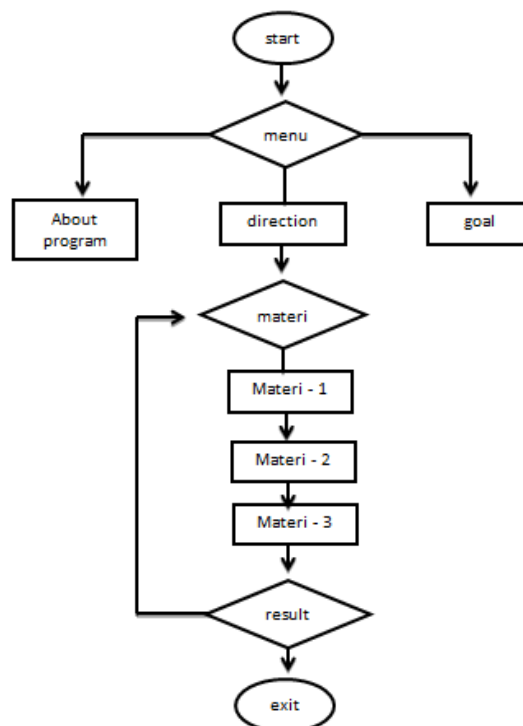
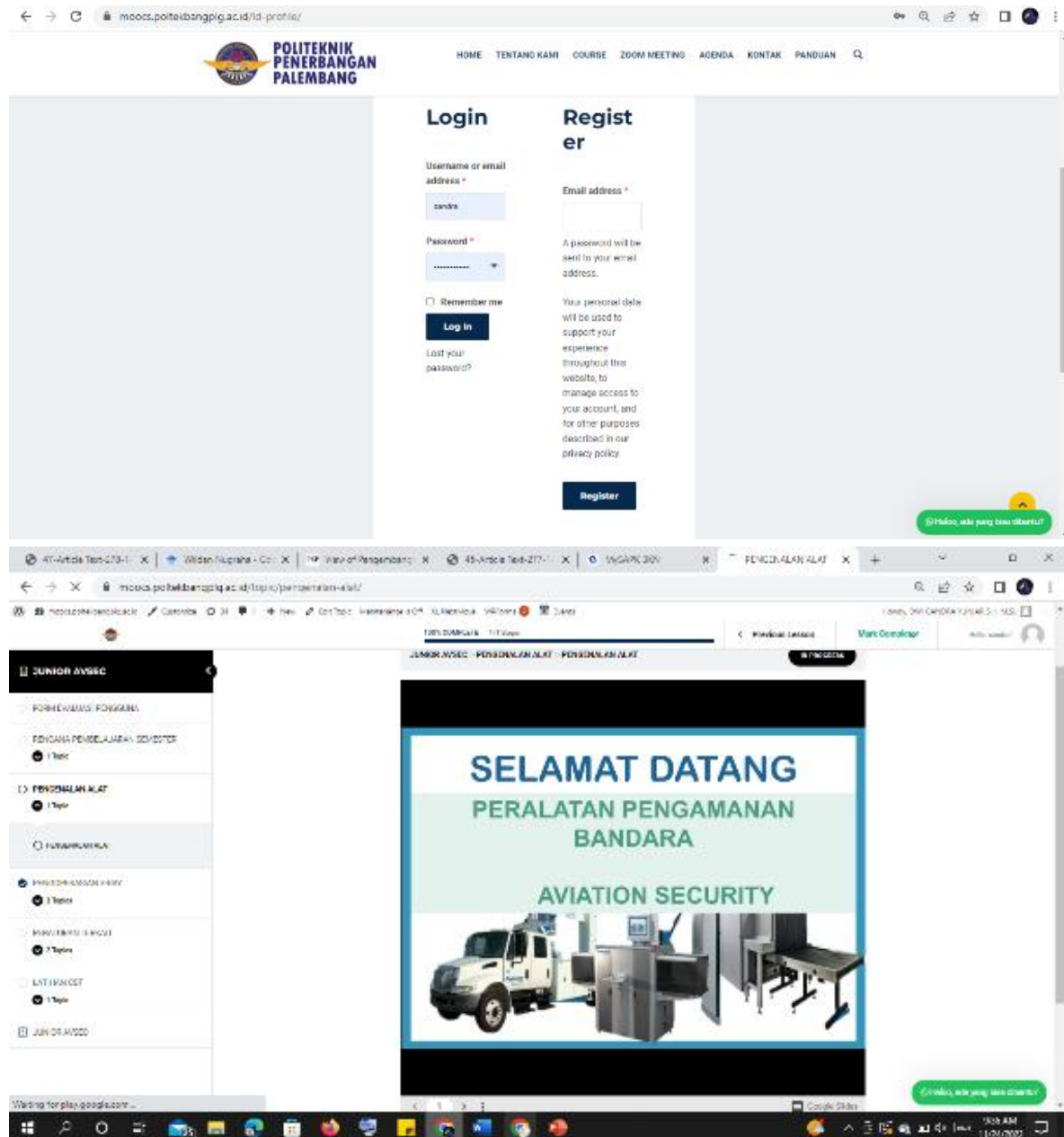


Figure 2. Flowchart Program Drill

Product development and design implementation include several activities such as data/material collection, programming, and testing. Below are the results of the development of learning media for the Aviation Security exercise (Batubara, 2017).



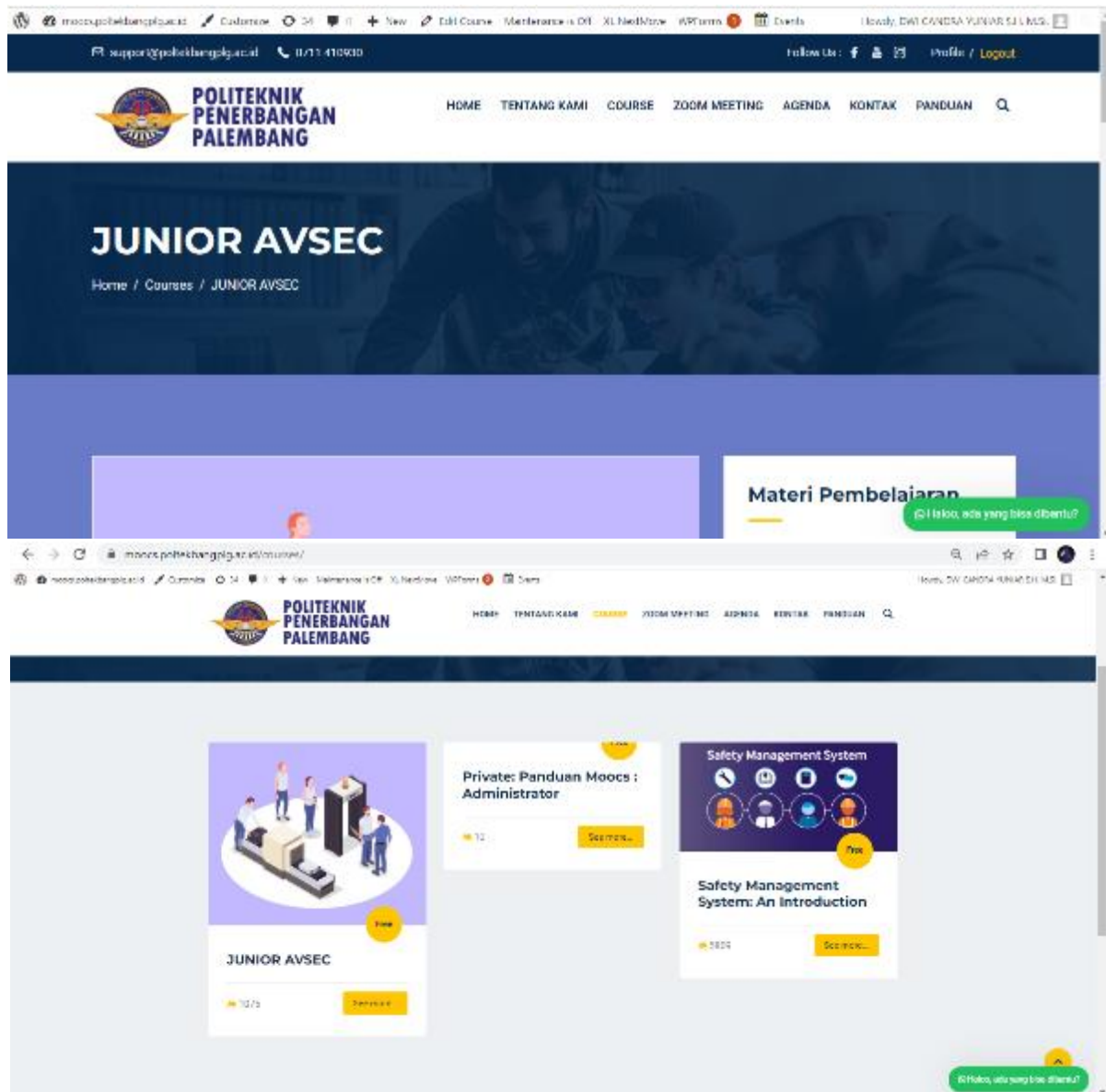


Figure 3. Product Development

The opening page is the start page on interactive learning media that contains a page to log into the account owned by each cadet. After logging in the user will enter the courses page where the user can choose what material to study, in this case the user chooses Junior Avsec, where the material provided in this application is presented in the form of videos, pdfs, or slides. In addition to the learning material, there are practice questions in the form of theory and examples of CBT questions.

The writing on the opening page is given an animation of characters from the Politeknik Penerbangan Palembang logo as well as a profile video from the MBU study program that welcomes students when using learning media. The menu choices presented in this application have been adjusted to the material in the Junior Aviation

Security course. The sub-subjects presented include discussing the Introduction of tools required by Aviation Security officers, Procedures for Operating Tools, and Related Regulatory Regulations that must be known by Aviation Security officers. In addition to Materi da Also Latian Questions in the form of X-Ray CBT Images and also theoretical materials needed by cadets when going to the licensing examination. A material page is a page that contains material and video tutorials provided by learning media. It is intended to help students learn material in learning media (Soleh et al., 2019).

The feasibility of interactive learning media is assessed based on assessments by media experts and material experts. The feasibility assessment of interactive learning media by media experts is assessed based on four aspects, namely language, graphics, program processing and use. The data from the assessment results from media experts can be seen in the following table.

Table 2. Assessment Results from Media Experts

No	Question	Result
1	Linguistics	85%
2	Grafika	80%
3	Program Processing	80%
4	Use	77%
Average		81%

Based on the results of the validation analysis of media experts regarding the Junior Aviation Security learning media developed resulted in an average percentage of 81%. The suggestions and inputs given by media experts are: "Learning media is good enough; it is necessary to add video material from each content in each sub-chapter to make it look even better". The assessment response of students as users to interactive learning media was obtained from the following trial data.

Table 3. Assessment Response of Students

No	Question	Result
1	Programming	86%
2	Media Display	84%
3	Content of the Material	90%
4	Benefit	82%

Based on assessment data from 48 students (respondents) as users, it can be described in the programming aspect as many as 86% answered very worthily, then

in the media display aspect as many as 84% answered very decently, while in the content aspect of the material as much as 90% answered very feasible and finally in the benefit aspect as much as 82% answered very feasible (Risdianto, et. al., 2021; Risdianto, et. al., 2021).

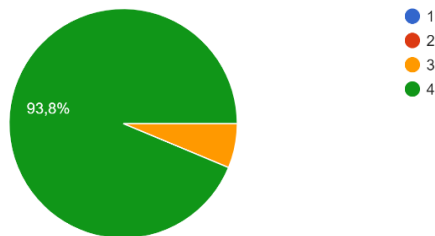


Figure 4. The Product is Easy to Use

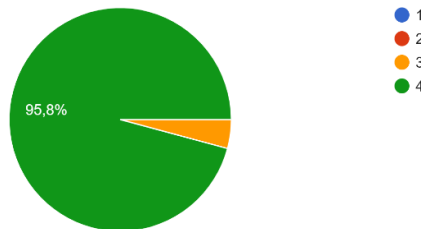


Figure 5. The Product is Interesting

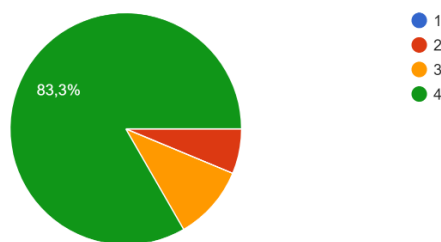


Figure 6. The Product is Better than Conventional

Table 4. Summary of Response

No	Question	Result
1	Ease	93,8%
2	Attractiveness	95,8%
3	More Interesting than Conventional Learning	83,3%

Based on assessment data from 48 students (respondents) as evaluators, it can be described in the aspect of convenience as much as 93.8% answered very feasible, then in Interesting as much as 95.8% answered very feasible, while in the aspect of comparison with conventional learning as much as 83.3%.

D. Conclusion

Based on the data from the evaluation and discussion, the conclusion that can be presented is the development of Aviation Security Learning Media on MOOCS using research methods to produce certain products, and product effectiveness testing (Sugiyono, 2015) can be used as another alternative in distance learning media at PSDT MBU Politeknik Penerbangan Palembang. The results of the validation analysis from validation experts got an average value of 81%. This shows that the learning media developed is valid according to the validity criteria and is very practical to use in the learning process in the Junior Aviation Security course.

E. Acknowledgement

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