Design Online Learning System for Kampus Merdeka: A Case Study Web Programming Course

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Abstract: Distance learning is an online-based learning model with an open model or a combination of face-to-face learning models. Currently, the term "Independence Campus" implies that students are given the option of attending lectures on campus or off campus according to their talents and interests, one of which does not leave the nature of online lectures. Currently, the learning model that can provide one of these facilities is the Massive Online Open Course (MOOC). This online learning can provide access anywhere and anytime by integrating technology into the learning process that can help improve the ability to understand the material. In this study, it will be measured how learning design using MOOC for "Kampus Merdeka" can affect the implementation of lectures, especially for the Web Programming Design course. A trial will be conducted to be able to see the effect of the implementation of the use of MOOC on the users of this MOOC. The choice of case studies for this course is because this course can provide practical learning activities that require an understanding of a strong theoretical basis so that it can be implemented in practicum. The result of learning web programming with the online learning design method using MOOC, which is useful for students is that they can practice source code directly through MOOC. In this study, the effect of using online learning design with MOOC which was attended by 30 people showed that an average of 78.2% was interested in joining MOOC online classes. This interest is because MOOC can provide self-development models such as material in the syllabus, learning videos and the ability to do practicals.

Index Terms: Kampus Merdeka, MOOC, Online Lecture, Web Programming

1. Introduction

The development of information and communication technology has become a part of everyday life that can be used to meet needs. One of the factors in the field of education that has developed at this time is the various types of learning media. During the process of this pandemic period, the learning media that is often used is online learning media. This process provides a virtual face-to-face media where the nature of this learning does not reduce the knowledge transfer process carried out. One of the universities that uses online media in the learning process is the State Polytechnic of Malang. The learning process uses one of the media, namely web e-learning with the name learning management system. The application of this media requires students to be enrolled in courses to attend lectures because it is in accordance with the study program they have chosen. Students from other study programs cannot take the existing courses because they are not officially registered. Basically implementing a learning system with credits, almost all of which require learning activities in the classroom. This shows the lack of learning independence that must be possessed by every student in carrying out their learning.

"Kampus Merdeka" provides the nature of learning outside the study program by giving students the freedom to choose various materials offered from their own campus, other campuses, or from the industrial world, only from home is an ideal thing to do during the COVID-19 pandemic. Various platforms can be used to provide online classes in a massive and open MOOC implementation. The platform used to support this MOOC learning system is Moodle. Moodle is currently one of the most popular types of LMS (Learning Management System) for learning media because it allows two-way communication between educators and students who already have a history of activities and freedom of use as well as making it easier for students and educators to arrange schedules and learning activities[3]

One of the innovations produced in learning without having to meet face-to-face or in other words is virtual explaining that the new concept is a solution in current learning, but with this new innovation there are several needs that cannot be met, one of which is freedom of choice. Massive Open Online Course (MOOC) is a web-based online course that attracts a wide range of people globally is a solution in the freedom of choosing courses in learning. Learning innovations that connect communication between teachers and learning media such as images, text, audio and video are used to find knowledge and gain experience from other students, take exams and get exam results. However, currently learning using MOOC still has obstacles in maximizing student participation in learning from beginning to end. [5]

MOOC is defined as an online learning environment with "Kampus Merdeka" that is open and easily accessible. MOOC creates novel approach inlearning and teaching. The platform provides lecturers or more known as facilitators who facilitate the participation of the participants by engaging and interacting with the participants [11] MOOC is a web-based technology that provides online courses which can be accessed anywhere, anytime and free enrollment. It is also a recent trends in e-learning [10] MOOC can be considered as new form of e-learning that integrates social network, expert facilitation, and online learning resources. Such online learning is expected to give greater flexibility and control over the learning process [15] In developing countries, such as Indonesia, MOOC is not yet popular because there are still forms of learning in infrastructure. Examples of MOOC sites in Indonesia are IndonesiaX sites, Dicoding, Open University MOOCs etc. In the programming field, MOOC programming has become one of the most popular and also accommodates a lot of data. This is because many store assignments and forum results that contain coding and various kinds of solutions for students. Even so, it is still necessary to provide features such as feedback for program functional results and syntax based on program structure. Currently, one of the Ministry of Education and Culture's programs is the Independent Learning or Kampus Merdeka policy which gives students freedom and autonomy to choose their preferred field (courses) outside/in the study program/campus. This freedom and autonomy is a right for every student (can take it or not) however, universities (PT) are obliged to facilitate it.

Pedagogy is a science that refers to learning strategies and learning styles. The purpose of this study is related to pedagogy learning which provides input to campuses to design new approaches to online learning systems that can support "Kampus Merdeka" towards the Massive Online Open Course system. This study also provides input to the campus that the development of this learning media can be used as a credit knowledge model as the end of the MOOC implementation. The material that will be implemented in the development of this MOOC learning system innovation is the Web Programming Design course. In this learning, students can be more flexible in learning according to their interests and talents which will result in a value of interest and satisfaction with the use of MOOC. From the results of this study, it is expected that students can complete the course according to the learning outcome course, which is to understand the basics and concepts on the website and practice web programming source code through MOOC.

2. Material and Method

Stephen Downes and Georges Siemens were building a course for University of Manitoba in 2008 namely Connectivist and Connective Knowledge [14], and the concept of that course spreadly known as Massive Open Online Course (MOOC). MOOC designed for the large numbers of geogrpahically dispersed students and is a free Web-based learning program. MOOC is not always offer academic credits but provide education that may enable certification or further studies [17].

MOOC have two main models that are cMOOC and xMOOC. In xMOOC, traditional teaching concepts are used, such as videos, tests, or quizzes. On other side, cMOOC collaborates on several social media so that teachers and students can share information about the learning experience. Basically, cMOOC based on the connectivist learning theory whether xMOOC based on the behaviourism learning theory. Web Programming course provides students learning experiences to create web applications. Lectures in Web Programming courses are in the form of lectures, discussions, assigments in the laboratory, and project papers including the presentations. The materials of this course are introduction to web programming HTML, Javascript, CSS, PHP, and Database operations with PHP.

This study intended to develop in learning innovation with the scope of research and development activities. Learning media was produced in the form of e-learning for Moodle-based Web Design programming courses. MOOC with ADDIE model was implemented systematically. ADDIE model was chosen due to the development procedure is detailed structured, suitable for developing instructional learning media, and has specific developed media objectives.

ADDIE model itself has various types of development models such as the Dick and Carey model, the ICARE model, the ASSURE model and other models. ADDIE consists of five phases that are analysis, design, development, implementation and evaluation in show Fig.1.
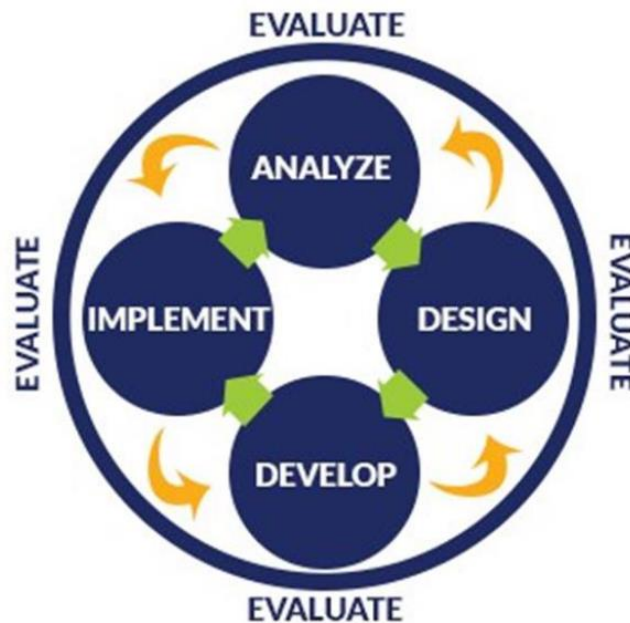

Fig.1. ADDIE Model

Analysis

Analysis process basically a process of determining and identifying problems that has to be resolved. The basis for developing learning media is the identified problems that appeared using various analyses. The ADDIE model analysis phase according to Lee and Owens, the learning design analysis phase separated into needs analysis and final result analysis. The analysis process includes the problems encountered, product requirements include product development objectives
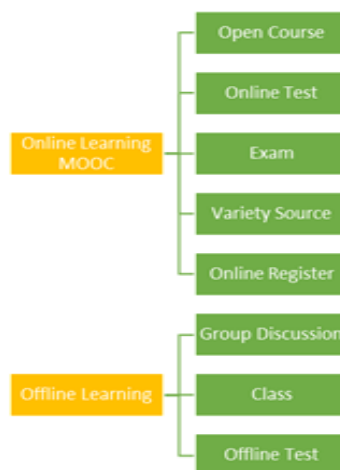

Fig.2. Kampus Merdeka Integrating MOOC

As shown in Fig.2 there are differences between online and offline learning systems. Online learning focuses on MOOC principles. Online MOOC focuses on implementing Kampus Merdeka that focuses on online courses, exams, online tests and online registers. Offline MOOC focused on group discussion, class, offline test. The technical features contained in online learning MOOC are that the open course is available during course selection and course registration, the online test is opened when the exam takes place on the application, the exam can display results directly on each selected course. For offline learning, the implementation is in the form of forums or discussion groups that can be accessed at any time.

MOOC being used as a learning medium as a substitue for face-to-face media during this pandemic. Participation of students are both in classrooms tutorials and lectures as well as learning in MOOC. Web Programming syllabus is shown in Table 1. Usign online quizzes, videos, or activitieas enabling the students to have self-gauged and self-paced learning.

Table 1. Pemrograman Web syllabus

Topic	Name
1	HTML
2	CSS
3	Javascript
4	Jquery
5	PHP
6	Database
7	Session and Cookies
8	Form

Fig.3.The concept of a MOOC was first introduced by Stephen Downes and George Siemens in 2008 as they were building a course offered by the University of Manitoba. The course's name was Connectivist and Connective Knowledge [4]
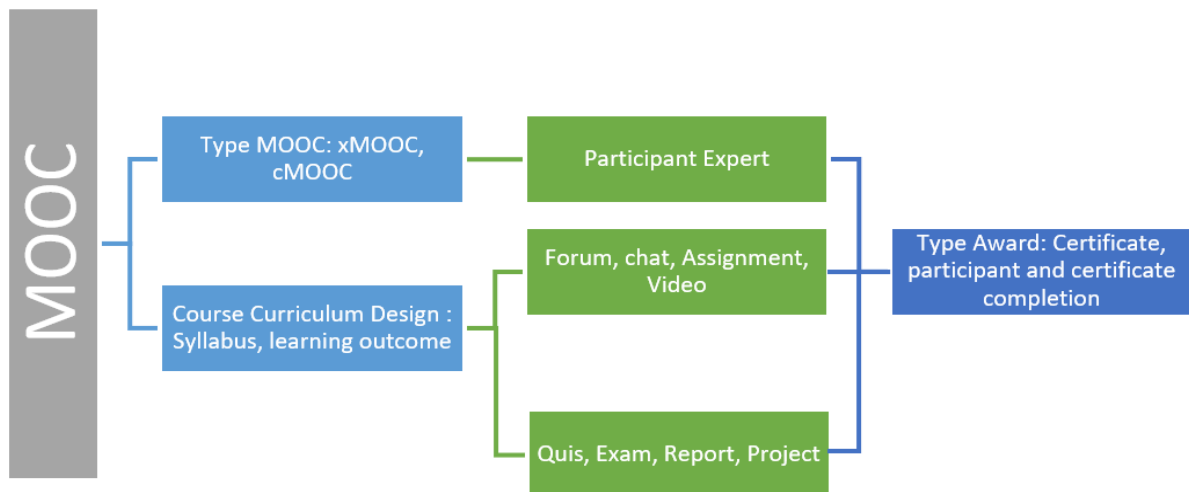

Fig.3. MOOC Design

Design Phase

This stage determines all goals, tools to be used to gauge performance, various tests, subject matter analysis, planning and resources. In the design phase, the focus is on learning objectives, content, subject matter analysis, exercise, lesson planning, assessment instruments used and media selection.

The design phase outlines the development plan and strategies used for MOOC and it has six activities. The activities involved are (1) design MOOC interface using moodle, (2) providing content of each topic, (3) designing and for each topic, (4) submitting (5) preparing activities for each topic for student self-assessmen.

Development Phase

At this stage of the process explain the overall picture of the design, structure, teaching approach, types of media and technology to be used, content and script/storyboard.The design stage is the planning stage of the learning media project that will be developed. The purpose of the design phase is to verify the desired results and the appropriate testing method. At this stage it is very important to plan strategies in developing teaching and outlining how to achieve teaching goals. Planning is the most important factor in the successful development of learning media.

Hisha muddin according to the output at the design stage will be input at the development stage and the multimedia device will adjust to the agreed specifications. Each development will be tested to the user to ensure that the system is consistent and effective.

Implementation

In the implementation phase, the uploaded learning videos are being tested on MOOC. Videos are viewed in terms of content validity, video smoothness and graphical appropriateness by field experts in order for any deficiencies to be resolved. Students were asked to do activities in each topic and assess their level of understanding and to see the effectiveness of MOOC in fulfilling their learning needs.
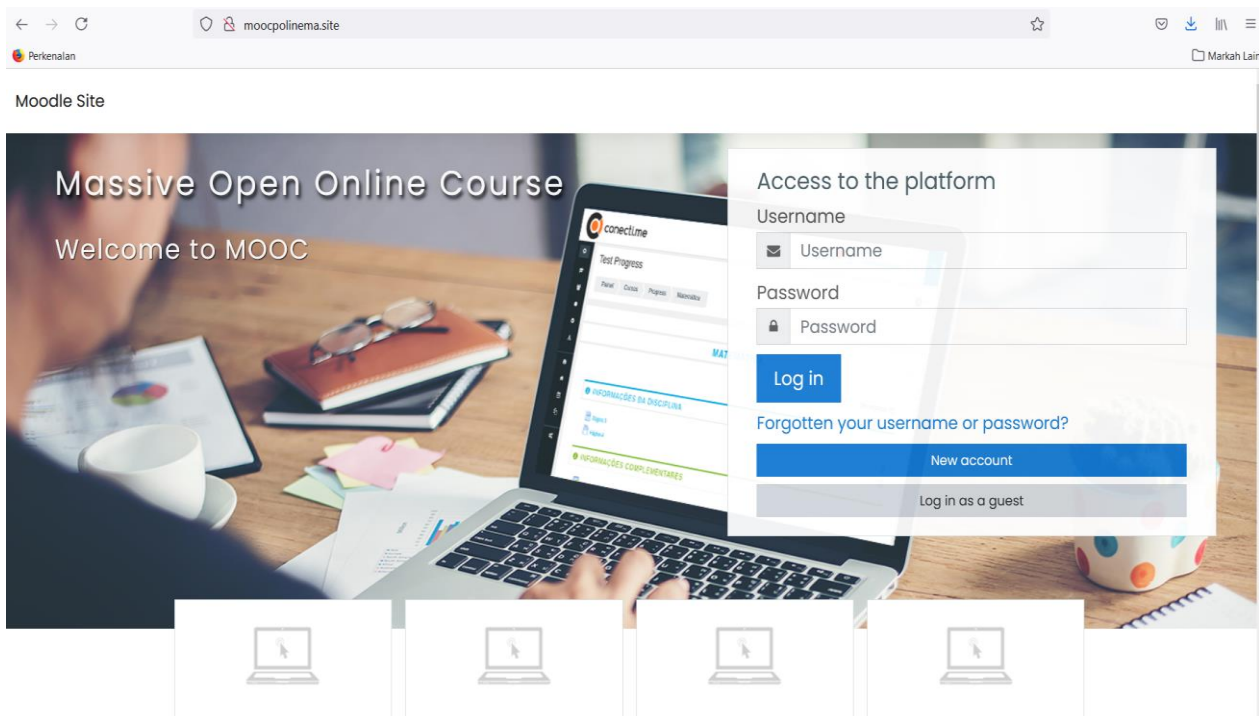

Fig.4 MOOC Pemrograman web frontend

Fig.4 shows the MOOC user interface of Pemrograman Web Frontend. The implementation of the ADDIE method lies in how to use the menu on the MOOC for students to view material and upload documents according to the agreed material. The goal is to know the improvement, feasibility, and evaluation of the application that has been made by the author. So that there is feedback given from experts, teachers, and students so that the application can continue to run and develop according the function.

"Merdeka Belajar" to learn is to give freedom and autonomy to educational institutions, and freedom from bureaucratization, lecturers are freed from complicated bureaucracy and students are given the freedom to choose the fields they like. (Nadiem Makarim Minister of Education and Culture). The above opinion is an independent learning concept that aims to give students the freedom to continue studying outside the campus.

The purpose of this activity is as an effort to get qualified future leaders. One of the policies of the Kampus Merdekais the right to study three semesters outside the study program which has the aim of increasing the competence of graduates, both soft skills and hard skills to be more prepared and relevant to the needs of the times, preparing graduates as leaders of the nation with superior and personality.

Fig.5. Credit acknowledge

New learning that can be an innovation in the implementation of independent learning which aims to develop knowledge and skills that can make students independent, take courses according to the desired topic for learning media innovation that offers an online and open course that can be offered by many organizers is called with MOOCs.

Present to provide solutions that can overcome these gaps, the presence of this model course is a positive reaction to the needs and problems of learning in the digital era, making it easier for learners to maximize their knowledge and learning experience. The main challenge of MOOC is the problem of scalability of feedback and support from MOOC users who easily decide to leave MOOC membership at any time.

The non-formal character of MOOC greatly influences and causes the result of uncommitted behavior from students. The factor of taking part in the institution or government in providing MOOC facilities is very important and greatly affects the success of the MOOC program in Indonesia

One implementation of the use of MOOC in an Kampus Merdeka where there is a MOOC model that can be managed by universities where students from universities can take certain courses with credit weights. After students take the MOOC online and are declared to have passed, the graduation will be entered into the assessment system without having to re-take the course at the original university / major. The Fig.5 above explains that in order to get credit score recognition, students have to get a graduation certificate from the course they are taking

Evaluation

At this stage, testing the web-based application to media experts and material experts to test the feasibility of the application by providing an instrument questionnaire. And tested on MOOC participants and lecturers to find out the response to the MOOC application by providing an instrument questionnaire that will get the conclusion of data analysis from the results of the questionnaire.

3. Result and Discussion

Thomas et al According to the population is the research target group where the results will be generalized. The population in this study was 30 students who took part in the Sampling program, which were respondents who were selected to represent a population. The sampling method used is purposive sampling consisting of second year students who have taken basic courses in each major.

The questionnaires were distributed online with a google form via social media. The questions in the questionnaire were designed with 8 questions using a Likert scale with a scale ranging from 0 = 'strongly disagree' to 4 = 'strongly agree'. There are as many as 30 respondents with different majors with students outside the IT study program as many as 10 people.
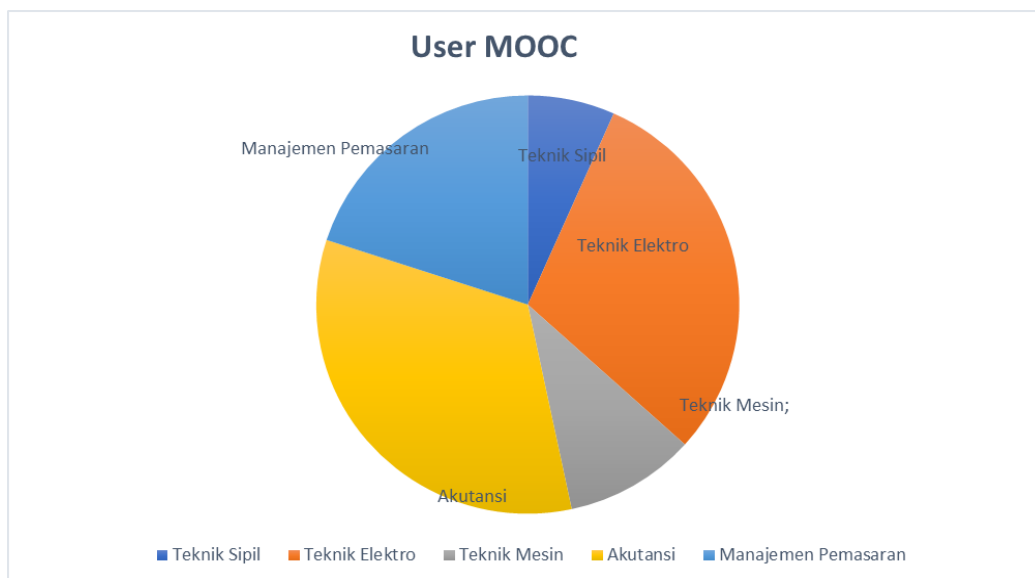

Fig.6. User MOOC

Data analysis is done by determining the average (mean) of each item, and determining the mean item in one category. Then the value is converted into percent (%) by dividing it by the maximum value of the range (4) multiplied by 100%.

To be able to give the meaning of the percentage results, an assessment classification adapted from [3] is used which is presented in Table 2

Table 2. Kriteria Validitas

Prosentase	Validitas
75.01 % - 100 %	Very Satisfied
50.01 % - 75.00 %	Satisfied
25.01 % - 50.00 %	Enough
00.00 % - 25.00 %	Not satisfied

Based on the participants' level of interest in using MOOC as follows

Table 3. Question Responden MOOC

No	Question	Average	Prosentase
1	What is the learning platform used appropriate?	3.05	76.3%
2	What do lectures use MOOC for learning?	3.17	79.4 %
3	What are the questions contained in MOOC as a learning platform?	3.17	79.4 %
4	What do you use a learning platform for all subjects?	3.16	79.1 %
5	What can MOOC be used at any time?	3.16	79.1 %
6	What do you always take advantages of learning opportunities using MOOC?	3.05	77.9 %
7	What do you often use MOOC to get material?	3.12	76.4 %
8	What can using MOOC stimulate learning?	3.13	78.1 %

The results showed that the average score was 78.2%. It means that the correspondents expressed satisfaction in using MOOC learning media. The use of the learning platform, namely Moodle, is believed to be able to provide input on one of the platforms used for MOOC with 79.4% support for respondents. Lecturers or teachers fully use MOOC for learning platform media containing videos, tutorials and quizzes on the platform as much as 79.1%. Respondents answered 79.1% for the use of MOOC which can be used for all media subjects, namely videos, files, etc. MOOC can be used at any time and take advantage of the opportunity to learn using MOOC with 77.9% of respondents. The results of this percentage show that students are interested in joining MOOC online classes because they can provide a self-development model, namely institutional (materials that are in accordance with the syllabus), pedagogical in the form of learning videos and technical (in the form of practicums).

MOOC can be used to share material and can stimulate online learning. It can be seen that the average respondent stated that their interest in the MOOC platform was that MOOC would later be implemented as a learning medium for "Merdeka Belajar". Suggestions from the results of student respondents are that the innovative use of MOOC as a learning media can allow for a new learning system that can include a self-development model

4. Conclusion

Using Massive Open Online Course (MOOC) as a learning innovation is a solution in learning activity during Covid-19 pandemic especially in Web Programming courses. Innovations and sevices provided by MOOC have several advantages on the learning process. MOOC provide a self development model that is institutional system and can be in the form of of material that is in accordance with the lecture syllabus, pedagogical in the form of learning videos, online tests, and exams as well as technical (in the form of practicum). The results of MOOC implementation can be observed from the success rate of understanding and practical implementation of students. The implementation of MOOC as a part of Kampus Merdeka in the future can be implemented using credit scores and students can attend online lectures according to their interests so that Kampus Merdeka can be implemented as designed. It is also important in the future research to consider the opennes of accesss about the information of course participants when taking the exams. I this study, researchers have not focused to these factors, so in the next research there should be control of the openess of access to information in question.

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