Development of online learning design

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Abstract. Development research aims to produce online learning designs to enhance the active role of students in utilizing e-learning to support the learning process in project management courses. The research method used in the development of online learning design is the ADDIE Research model starting with conducting analysis and design to define the needs of students in online learning based on learning outcomes in courses, then developing with LMS Moodle, and implemented in IT Project Management courses. Learning design that has been developed in e-learning to support the learning process of IT project management is then validated by several experts, namely software development experts, and learning experts so as to produce a blended learning model. The results showed that online learning design needs were very high to support student activity in using e-learning and received positive responses from students in the use of e-learning to support face-to-face learning in the classroom.

1. Introduction
Changes in the learning paradigm occur from the paradigm focusing on the teacher/lecturer to learning focusing on students or students. In higher education, Student-Centered Learning is known as student-focused learning. The integration of educational institutions in producing quality learning conducted by lecturers and students is a complete form in this approach [1]. The online learning system has now begun to be widely used by various sectors of the institution so that learning can be done anytime and anywhere without being limited by space and time. The Directorate General of Higher Education in Indonesia is quick to respond to the flow of this development by running the Indonesia Open and Integrated Online Learning (PDITT) program. In the initial stage, PDITT was run by six well-known universities in Indonesia and is expected to involve other tertiary institutions in the next stage.

One of them is in the Information Technology Education department of IPI Garut, since the first generation has been introduced to the learning model with online learning, with the hope that educators want to achieve is that the existence of e-learning can add new spaces to students in implementing learning processes such as utilizing teaching materials that have been provided by lecturers, attend online evaluations with results that are immediately known and stored in their respective profiles, sending assignments with special services that have been made by the complete lecturer with the time limit for their work so that students are more disciplined [2].

Based on the preliminary data obtained from the blended learning process in the introductory information technology course for the first semester of the 2018-2019 academic year at the Indonesian Education Institute. Active users in online classes for one semester are 94% with various kinds of activities in it, starting from the role of students using teaching materials provided by lecturers, utilizing
discussion forums to work on the questions understanding or just discussion between lecturers and students, or students with other students. The activeness of students in utilizing the content is 87%, the discipline of students towards the execution of tasks that have been mutually agreed upon 92%, the average value of the student gets assignments designed by 86% of lecturers.

E-learning will bring the influence of the process of transforming conventional education into digital form, both in terms of contents and systems. According to Hadjerrouit, web-based learning (web-based e-learning) has three main factors, namely pedagogy, content, and technology [3]. Content is one of the supporting elements in achieving web-based learning, therefore the development of e-learning with a learning design that is in accordance with student characteristics is very important considering the Indonesian Institute of Education already has an e-learning portal, e-learning utilization, especially in Information technology education department starting from the 2015-2016 school year. Nurchali also states that the use of computers in learning can provide many and varied learning experiences, increase motivation to learn and develop ICT skills (Information and Computer Technology) [4].

Learning design should associate new material with existing material and material presented in different models to facilitate individual differences in processing and transfer to memory is one of the implications of cognitive learning theory on the design of online learning strategies [5]. Moodle provides five types of features for interaction activities between students and students and students and teachers. These features are: chat, forums, glossary, wikis, and workshops [6].

The lesson design starts with material that is easily increased to complex material, giving students the opportunity to carry out tests after completing their learning activities, without waiting for the other friends to finish all. So that students can control the learning process is one of the implementations of the principles of behaviorism in e-learning [7].

Based on the background above, the researcher intends to develop a learning design to complete the online learning course page, especially in the Information and Communication Technology department with the aim that students can play a more active role in utilizing existing content to support the learning process. Lecturers can track students’ understanding through discussion forums, a good and clear content flow that will support the achievement of learning objectives with the help of e-learning media.

2. Method

This research is a type of research and development or research and development (R&D). Research and Development is a research method used to produce certain products, and test the effectiveness of these products (Sugiyono, 2013) [8]. This study aims to develop the design of online learning to enhance the active role of students in IT project management courses. The development model used in this study is the ADDIE model. The stages of ADDIE model development research are (1) analysis, (2) design, (3) development, (4) implementation, and (5) evaluation.

The analysis carried out included: giving a questionnaire for initial data collection regarding student involvement in the use of e-learning to support the learning process in the classroom, especially in IT project management courses. The design includes the determination of learning objectives in the course based on RPS (Semester Learning Plan) and RTM (Semester Task Plan) that have been designed before the lecture begins, resulting in an overview of activities that will be created in e-learning to increase the active role of students. Development is carried out by making activities based on the results of previous designs to create a content that can be used by students such as making labels to make descriptions of courses, inserting material, discussion forums for understanding that lecturers can assign, to all types of good assignments done offline and online. The implementation was carried out by expert validation and trials in the project management lecture for the 2018-2019 school year. Evaluation is done by looking at the activeness of students in accessing e-learning, reading the material, conducting discussions on understanding questions, working on assignments based on the time made.

The research instrument used was in the form of observations and student response questionnaires. Observation by directly observing and recording student behaviors when accessing e-learning. The population in this study were all students of the Information Technology and Communication Education Study Program 2018-2019.
3. Results and discussion

The results of the analysis based on observations found that the characteristics of students majoring in information technology education are students who are already familiar with e-learning. This can be seen from the results of the questionnaire which stated that in their study program an online learning system was introduced using e-learning as much as 99% and active users in online classes for one semester were 94%.

The online learning design to enhance the active role of students in the learning process consists of several activities. The homepage course is the starting page when students open an IT project management course at e-learning IPI. In this activity, there is a design plan for online learning based on the results of the analysis phase, which is carried out in this stage is the preparation of RPS and RTM to support the design of content in e-learning. The design of the lesson starts from the opening words for the project management course which consists of the achievements of the course along with the opening words of the lecturer equipped with the identity of the lecturer.

![Figure 1. Display of the homepage course for IT project management.](image)

Some activities that will be made in one opening meeting are in the form of course descriptions, learning resources with activities of files, links, and wikis, about understanding with discussion forums, assignment activities to facilitate students in sending assignments done offline, so students become more disciplined in shipping assignment, the opportunity given once with the time stated clearly.
The results of the formative evaluation of online design designs in the form of learning activities made by lecturers to facilitate the learning process in IT project management courses have been able to be declared successful in increasing the active role of students seen from the activity report in the system 94% of students use online learning. A product feasibility test is carried out by providing assessment instruments in the form of a questionnaire to validators consisting of software development experts and learning experts. Data from validation test results from software experts and learning experts table 1 and table 2.
Based on the Likert scale interpretation, the results of the percentage of achievement of the overall aspects of the software development validation test of 93.3% showed that the products developed were considered good in developing the software. The results of the percentage of achievement of the overall aspects of the learning expert validation test amounted to 93.7% showed that the products developed were considered very good.

### Table 1. Software development expert validation test results.

| No | Aspect             | Number of Testers | Score Gain | Score Criterium | %   |
|----|--------------------|-------------------|------------|-----------------|-----|
| 1  | Feature            | 2                 | 20         | 10              | 100 |
| 2  | Interface          | 2                 | 30         | 15              | 100 |
| 3  | User Characteristics| 2                 | 18         | 10              | 90  |
| 4  | Interaction        | 2                 | 36         | 20              | 90  |
|    | **Average**        |                   |            |                 | 93.3|

### Table 2. Learning expert validation test results.

| No | Aspect    | Number of Testers | Score Gain | Score Criterium | %   |
|----|-----------|-------------------|------------|-----------------|-----|
| 1  | Relevance | 2                 | 43         | 25              | 86  |
| 2  | Efficiency| 2                 | 19         | 10              | 95  |
| 3  | Flexibility| 2              | 20         | 10              | 100 |
|    | **Average** |                   |            |                 | 93.7|

### 4. Conclusion

Based on the results of formative evaluations by software development experts and learning experts, as well as the results of trials during direct implementation in learning IT project management courses it can be concluded that the design of online learning which consists of several learning activities can enhance students' active roles with and can be used as a reference for other lecturers in designing online learning, what content needs to be prepared so as to increase the active role of students even though learning is done remotely.

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