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Development of E-Learning Models in Database System Courses

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Abstract

Abstract—**This study aims to develop products in the form of teaching materials database system subjects with the application of e-learning. The research method used is the Rn D method. The results of the formative one-to-one learner evaluation were carried out between the developer and three individual students. Tech reading in learning materials in information and communication technology courses is very clear and can be read by students well. The quality of the images displayed in the learning material and e-learning is very good and in accordance with the material content of. Clarity of basic competencies to be achieved and indicators of material presentation on learning materials and e-learning programs in the Database Systems course have been very good and easily understood by students.**

Keywords— *product, teaching materials, e-learrning, RnD method*.

I. INTRODUCTION

The use of databases or databases is needed in various fields in a company / organization, like a database is a warehouse in data storage because databases are one of the important components in information systems that provide information for users in using data in accordance with their duties and functions. The underexed database or those that are not well prepared will certainly result in a number of problems, because interacting with the database is not only dealing with the problem of designing, accessing and inputting data but also with issues of redundancies and data inconsistencies, difficulties in accessing data, data isolation for standardization, multiple users, data security, data integration and data independence. Therefore learning is needed which can understand database concepts correctly, which currently does not have a structured learning design. Learning is defined as a deliberate effort by educators to support student learning activities (Kusumandari & Istyarini, 2015). **L**earning design focuses on the t*eaching-learning process* that happens in a lesson, a unit of learning or a course (Devilee, 2018). Whereas Crross & Conole says that learning design refers to a range of activities associated with better describing, understanding, supporting and guiding pedagogic design practices and processes (2009:1). Learning design is a complex spesification, and requires a substantial supporting frramework of components and services if it is to trans from the experience of learning technology (Koper & Tattersall, 2005:41).

Technological development makes it possible to create a fun learning process. One of them is by utilizing telecommunications technology. The use of telecommunications technology for learning activities in universities in Indonesia is increasingly conducive to the development of increasingly rapid and easily accessible technology so that more and more human resources can take advantage of this technology in encouraging conventional universities to organize distance education. Georgsen & Lovstad argue that .. for flexibility in education, information and communication technology (ICT) is increasingly used to support the learning designs in work place-learning (2014). Learning content becomes more dynamic, effective and enjoyable (Irwansyah, et all. 2017).

Pletteaux & Hoein says .. the ICT use mainly supported hybrid courses, alternating between face-to-face and online, and "enhanced classrooms," that is, classrooms equipped and networked with educational technologies (2015). Furthermore, Georgsen & Lovstad argue that .. for flexibility in education, information and communication technology (ICT) is increasingly used to support the learning designs in work place-learning (2014). Development of e-learning model database system subjects designed by adopting one of the learning models supported by system facilities that can learn anytime and anywhere without being limited by distance, space and time and varied learning materials so as to improve the quality and learning outcomes students efficiently and effectively. It is expected to be able to distribute teaching materials, update teaching materials appropriately and quickly and be accessible to more than one student so that research on the development of e-learning models of database system subjects is important.

II. METHOD

This research is a form of research and development which generally aims to produce products in the form of teaching materials database system with the application of e-learning that can be used by students to study face-to-face or independently, e-learning, and technical instructions for using e -learning. Developmental research seeks to create knowledge grounded in data

systematically derived from practice (Richey & Klein, 2005:24). Educational Research and Development is a process used to develop and validate educational product (Borg & Gall).

The research and development of this model produces products in the form of database system teaching materials that will be applied in the development of models in e-learning for FIK students in the Department of Information Management or Informatics in odd or even semester, this teaching material is used for one semester. The approach is determined by observing the phenomena observed by the subject of the conceptual world through actions and thoughts to understand the meanings compiled by the subject around everyday events (Kusumandari & Sukirman, 2017).

III. RESULT AND DISCUSSION

The results of the analysis of the development needs of the e-learning model in the database system course are based on the findings of questionnaires and interviews with students, colleagues (lecturers) and product users. After the researchers analyzed the results of several questionnaires and made direct observations with students that students really wanted the e-learning process specifically to use the internet as a means of providing networks in the learning process, because informatics engineering study programs, information systems in computer science had no complete facilities such as having a computer laboratory, multimedia laboratory and providing wifi networks.

Instructional approaches set a general direction of trajectory for the instruction and are comprised of more precise or detailed components (Reigeluth & Chellman, 2009:31). Instructional design is this linking science-a body of konwledge that prescribes instructional actions to optimize desired instructional outcomes, such as achievement and affect (Reigeluth, 1983:5). Instructional Models are guidelines or sets of strategies on which the approaches to teaching by instructors are based. Effective instructional models are based on learning theories. Learning Theories describe the ways that theorists believe people learn new ideas and concepts (Schneider, 2014:155).

From the results of interviewing researchers with colleagues or lecturers, the learning used is still conventional, namely using lecture methods and using various kinds of media as a supporting tool to explain lecture material. The internet used by lecturers is only a tool for collecting assignments via e-mail, and using social media, blogs to post lecture support material.

Then the results of interviews of researchers with product users, namely informatics engineering study programs, information systems of the Faculty of Computer Science, University of Banten Jaya. Unbaja has had infrastructure to be used as an e-learning learning tool, but it does not yet exist among lecturers who use these facilities. Departing from the above problems, the researcher needs to develop an e-learning model on the subject of the Infra-Engineering Engineering database program, the information system of the Faculty of Computer Science at the University of Banten Jaya.

From the results of expert design evaluations of learning materials and online or e-learning sources the Database System exists, so here are some suggestions from design experts, namely:

First, the type of paper size of teaching materials used is recommended using a B5 paper size that is almost the same as the size of the paper book used by some book publishers. Second, every material presented from each chapter is equipped and supported with photos and designs as explanatory material for learning materials. Photos can be downloaded via the internet by creating a source with a web site address or URL. Third, learning material for database systems presented through e-learning is no longer included in book-based learning material. Fourth, elearning learning materials should be presented with material that needs explanation using multimedia support such as video, animation and audio supporting lecture material.

From the results of media expert evaluations of learning materials and online or e-learning sources, the Database System exists, so here are some suggestions from design experts, namely:

First, the use of making photographic images in learning materials is presented proportionally in accordance with the original image not widening to the side. Second, typing learning material for database systems should use a special application program for book printing, namely adobe design. third, printing college learning materials is expected to use full color and copy tutors. So that the display of learning materials can be satisfying.

From the results of the contest (content) expert evaluation. Learning materials and online sources or e-learning database systems are available, so here are some suggestions from design experts, namely:

First, the evaluation of expert content suggests that the use of language in subject learning materials is expected to be more communicative so students are easy to understand the learning material. Second, to fill out teaching materials to add several components such as competency maps, general instructional objectives, specific instructional objectives, formative evaluations along with key answers, exercises from each chapter of learning material, descriptions of teaching materials and author's history. All expert advice has been corrected according to expert advice. Third, content experts propose to improve the language in the exercises from each chapter. The language used is not in the form of test questions but is presented in the preses understanding of learning material. The researcher has made improvements, practice questions from each chapter of the learning material. Thus, formative evaluation (one-to-one expert in the field of design, media and content has been refined according to expert advice.

Formative evaluation of one-to-one learner (individual student test) is carried out between the developer and three individual students. Students who are enrolled are having characteristics such as goals, here the researchers took 3 students who had low, medium and high abilities. In this small group trial students were

introduced to e-learning materials and book learning materials for the Database Systems course.

The purpose of this trial is to identify and reduce error errors significantly in elearning learning materials and learning materials from database system books. From the results of individual trials, it aims to find out some errors in the product development of e-learning and learning material such as typo. Words are missed, words that are missing illustrated images that do not match the bibliography settings, coloring the display on elearning media, material entered into elearning media.

The results of the formative evaluation conducted by the three students in holding individual tests based on the results of the questionnaire obtained answers that were from the display quality of the product, the quality of product presentation and user interaction of the program. While from the results of interviews with the three students in individual tests, the following information was obtained.

Tech reading in learning materials in information and communication technology courses is very clear and can be read by students well. Clarity of learning material presented in learning materials and e-learning programs has been very good in detail from understanding to the concept of learning material.

The quality of the images displayed in the learning material and e-learning is very good and in accordance with the material content of. Each chapter of learning. While the color composition in the e-learnimg program is very good. But there is still a need for additional animation, music and instructions for using the e-learning application program.

Clarity of basic competencies to be achieved and indicators of material presentation on learning materials and e-learning programs in the Database Systems course have been very good and easily understood by students. The ease of understanding the material and the accuracy of the order of presentation, the adequacy of the training and the adequacy of the training in the learning material and the e-learning program have been very good and easily understood by students. But there are still many students who ask about the systematic learning materials that are different from the learning material they have read from various references. Whereas: their e-learning program was very impressed with the program because so far they had never studied like this. During this time they only knew the blog, edmodo e-mail as a tool in learning.

Student interaction with the material in learning materials and e-learnning programs strongly supports the interactive occurrence between students and learning materials. This includes the practice questions in each chapter of learning materials and formative evaluation at the end of the learning material.

Whereas in the e-learning program students can work quizzes, exams and exercises directly on the program without having to be in a classroom at a different place and time. While the material contained in the program can be stored by students, so students can learn on their own repeatedly. But students suggest to include all the material as a whole put into the elearning program.

Formative evaluation activities for small groups or small groups are carried out with 9 high, middle and low ability students. The purpose of this small group trial was to identify shortcomings in institutional activities after being revised based on individual evaluations. The expected input is not only about learning materials and e-learning programs but also instructional processes. This small group test data was collected using a questionnaire. Formative evaluations were carried out in the computer laboratory and lecture room.

In this small group trial students were given learning materials and opened an e-learning application program in a computer laboratory. The researcher explains the learning material to the students what the content is and how to apply it in the learning process. After students learn and understand the overall learning material. Students are given a questionnaire to be filled in about Learning material sourced from books and e-learning. In the end the researchers conducted interviews one by one from the nine students about their responses to learning materials that they had learned both from books and online through e-learning. From the results of the formative evaluation for the small group, the research received input from the nine students on learning materials and e-learning database system subjects, namely:

First, students are still confused about using learning materials and e-learning. From the student input, the researcher explained to students that learning materials were used in book and online forms. Second, students propose in the compilation of bibliography in the learning material that each chapter of the chapter should be arranged alphabetically from the name of the author of the source of learning material. Third, in the formative evaluation of small groups students propose for e-learning to complete learning material by adding animation so that lecture material becomes interesting. Fourth, students advise researchers to use the learning process directly because the learning material is very interesting and no lecturer has used it.

Based on input, suggestions, criticism and validation of one-to-one experts (design experts, media and content), one leaner and small group. The next stage is stabilizing the final product by conducting 20 field trials or field trials. Data collected in the trials of students using books and e-learning using questionnaires as attached. Emphasis on testing at this stage still focuses on the design of learning materials databases, the results of improvements from the small group.

The process of implementing student fields is introduced to learning materials and e-learning programs. Then they observe all the overall learning material. After studying the two learning materials the researchers asked for their feasibility of the products that the researchers had developed in both forms of books and e-learning programs.

Include: Relevance and scope of learning from book learning materials and e-learning materials in the subject of competency of the subject of Database Systems. The material of understanding and understanding of the material and the material presented in accordance with the Intellectual Objectives to be achieved. Then whether the e-learning program is a learning tool for learning

planning, subjects can be used to learn when learning, where students can want to study

IV.CONCLUSION

Learning with the E-learning Model in Database Systems is to combine e-learning with conventional models or face to face (face to face). Learning in this course is carried out with several direct face-to-face sessions using learning materials from the stale data system and several other meetings with e-learning, namely students can use the method online with the web. Learning material has been provided on the student web where it can be accessed at any time.

Conceptual model of learning in database system subjects with technology-based learning and information with e-learning based learning. The combined aspects can take the form of methods, media, sources, environment or learning strategies not only combining face-to-face and online.

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