Lecturer Competency Development Model in Designing a Line Learning Resources in University of Muhammadiyah Sumatera Utara

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Abstract

This study aims to produce a model for developing lecturer abilities (training model) in designing online learning. With the existence of this lecturer capability development model, later the UMSU and the lecturers can easily design and implement an online integrated learning system (SPTD) effectively. The results of this study indicate that the development of lecturer competence in designing online learning resources can improve the quality of human resources that support SPTD at UMSU. The result of this research is a prototype of an open online training program that gives lecturers the ability to design SPTD through the following materials: online learning design, introduction to OER, steps to carry out instructional analysis to obtain competency maps and an outline of an online learning program (GBPP) containing ready-to-use teaching objects. uploaded to the appropriate platform, as well as teaching materials in the form of modules. Teaching objects are in the form of learning programs in various forms such as text, presentations, learning modules, videos, animation, part or all of the subjects/ courses / training subjects, which are ready to be uploaded/ uploaded to various SPTD platforms.

I. Introduction

Information technology cannot be denied that it has made a big contribution in improving the quality of education in academics, administration and management (Akrim, Zainal, & Munawir, 2016). At the beginning of the development of computers, educators have used it to help provide learning materials in the form of CAI (computer assisted instruction) or to help manage education in the form of CMI. Advances in Internet technology provide great benefits for the world of education. The use of the Internet in education, among others, is to deliver web-based learning materials or often referred to as e-learning or online systems (Sulasmi, 2020). The e-learning system has been developed by various educational institutions, among which are active universities, and is now the backbone for the implementation of distance education. As UNESCO has introduced the concept of Open Educational Resources / OER since 2002, and defines it as learning materials or research reports that are openly licensed, meaning that they can be used, adapted and distributed freely. (UNESCO, 2011).

Open Educational Resources / Open Educational Program / Open Courseware are educational resources that contain open licensed content in various mediums such as videos, textbooks, computer-based multimedia that are openly available to teachers / lecturers and students and are designed for support learning activities. Kanwar & Uvalic-Trumbic (2016) in the process of integrating OER in learning by teachers and lecturers and the use of OER by students from these teachers and lecturers, users do not need to pay license fees. With the

many OERs available on the internet, a teacher or lecturer can take advantage of it by integrating it into the applicable curriculum. There will be no point in abundant OER if teachers and lecturers do not design their integration into the applicable curriculum efficiently and effectively. A teacher or lecturer can take advantage of quality OER as a measure of their learning program. But once again it is necessary to design the integration of OER in learning activities. A teacher or lecturer is expected to be able to integrate OER selectively, easily accessible, and be used by students to develop the knowledge and skills that have been determined in the curriculum they use. A survey conducted by Daryono and Belawati (2013) regarding the use of OER or Open Learning Resources (SPT) at universities in Indonesia that actively utilizes information and communication technology in the learning process shows interesting results. The survey results show that free access to the best SPT available on the internet has indeed been well received and utilized as a learning resource that can improve the quality of learning at the respondents' higher education institutions. However, the respondent's institution admitted that they prefer to use an existing SPT rather than making an SPT that can be accessed by other parties. The use of SPT in respondent institutions is still not well established due to the absence of policies and limited infrastructure in that institution. With this online training, it is hoped that lecturers at higher education institutions in Indonesia will start trying to design and make SPTD that can enrich SPTD in Indonesian for the curriculum in Indonesia.

In line with advances in information and communication technology in education today, now the learning approach has changed towards learning the knowledge age (Nasrudin, Agustina, Akrim, Ahmar, & Rahim, 2018). People can study anywhere, anytime, with anyone (M. Akrim & Harfiani, 2019). That is the characteristic of learning the knowledge age known as computer-based (Mr Akrim, 2018). One of the skills in the world of learning that is currently developing, because it is facilitated by the development of information and communication technology (ICT), is the skill of developing and implementing online learning or online learning. In line with that, since the Indonesian Open and Integrated Online Learning (SPADA Indonesia) was carried out by the government through the Directorate General of Higher Education, the online learning system has been used as a learning model that must be developed in Higher Education. SPADA Indonesia is intended to increase student access to learning throughout Indonesia to quality courses from high quality universities or lecturers.

In connection with the description above, it encourages Muhammadiyah University of North Sumataera (UMSU) to carry out online learning innovations which are expected to be an advantage for UMSU compared to other universities in terms of the quality of learning and ultimately have an impact on the quality of graduates. Of the 38 Study Programs at UMSU, currently the realization of online learning has been carried out in the UMSU Higher Education Management Masters Study Program. Prasasti (2019) stated that the development of technology, communication and information, especially the internet has become a demand for teachers in Indonesia to be able to use it as a source of positive learning media in supporting teaching and learning processes. The use of technology media provides benefits for teachers and students to access learning materials and interact directly in learning in the classroom, and also outside the classroom through online media.

In essence the process of learning interaction is a process of communication between teachers and students. Through the communication process the teacher can convey his knowledge or experience for students to learn. But not infrequently this communication process does not take place or run well, sometimes even confusing because of the misunderstanding and misconception (Rangkuti, 2019).

The development of online programs to improve lecturer abilities has been widely offered. Some of them The Institute for the Advancement of Research in Education at AEL (2004) succeeded in concluding 9 principles that should be fulfilled by such a program, so as to guarantee the program's effectiveness. The nine basic principles are: (1) Must be based on the results of the analysis of the learning needs of students, (2) Involve the use of technology by training participants, (3) It is closely related to the work of lecturers and teachers, (3) Can be applied specifically to the curriculum that applies, (4) Covers knowledge, skills and attitudes, (5) Takes place at sufficient time, (6) Takes place with colleagues and training participants, (7) Provides technical and other support for participants, and (8) Involves evaluation of training processes and results.

Furthermore, The Foundation Coalition (http://www.foundationcoalition.org) suggests steps to design a program to increase the ability of lecturers and teachers as follows: (1) Developed based on existing models, (2) Involving training participants (lecturers and teachers in planning), (3) Establishing training objectives to determine the optimal learning experience, (4) Involving students in a variety of training methodologies, (5) Sharing authority between designers and training participants in determining objectives, resources and discussions, (6) Integrating programs into work and performance appraisal of teachers and lecturers, (7) Providing support, (8) Carrying out an ongoing assessment of the training process and results. Walker, et al (2012) compared the design of a lecturer / teacher training program for the integration of ICT in learning. In the first program, lecturers / teachers are trained to improve their abilities and skills to obtain, select and design classroom activities, by utilizing online learning resources. The second program, like the first program but coupled with training, designed problem-based learning for students from teachers who participated in the training. The result is that students from teachers who took part in the second program experienced improvements in behavior, knowledge, and attitudes. The students of the teachers who participated in the first program experienced an increase in improvement only in attitudes.

II. Research Methods

This research is a development research (R & D) aimed at validating and developing a "model for developing the competence of lecturers in the UMSU environment in designing online learning". Development research according to Sugiyono (2015) is a process or method used to validate and develop products. This research uses a mixed method approach (mixed quantitative-qualitative type embedded), namely qualitative methods as the primary method that guides quantitative data as a secondary method which is carried out in one research stage (qualitative-quantitative stages together). Creswell (2014) states that the embedded strategy is very attractive, the analysis of two types of data simultaneously can be carried out by means of a side-by-side comparison or description as two different images that present a combined assessment of a problem. Data analysis procedures for the validity of research data using a statistical approach for quantitative data and data transformation for qualitative. Refer to Creswell that the embedded capability approach can carry out surveys and at the same time conduct interviews, observations and detailed documentation studies. Quantitative data analysis using statistical techniques. Meanwhile, quantitative data analysis uses the technique of interpretation (code) from the results of interviews in a broad and in-depth manner. This stage or development research steps adopt the stages developed by Sugiyono (2015) as follows:

1. Preliminary study, this study is conducted through literature and field research. The literature study is carried out by examining various theories, concepts, and relevant research results. Field studies, the authors conducted by observation, interview, and documentation study using a field approach.
2. Initial model development planning, this development is taxable based on the results of preliminary studies that took place in the field and literature review. This technique is based on the condition of the subject's needs so that the model design process will involve lecturers in groups and individually.
3. Conduct testing designs, first validate the designed model, then validate. Model design validation is very important at this stage, in order to improve and refine the model design.
4. Conduct limited field trials. The whole of this limited trial process is then evaluated to obtain a definite formula regarding the results of this limited trial. Then make revisions and improvements to the designed model.
5. Conducting main field trials, namely conducting trials on groups of lecturers (6-10 people). Testing at this stage is more experimental (quasi experimental design).
6. Conducting operational field trials, namely conducting trials on all lecturers through a comprehensive training process. The initial action that is carried out in this stage is to provide training and workshops related to the developed model which then conducts operational field trials, collects data and compiles research reports.

The research data that the authors collect comes from predetermined respondents, namely the permanent lecturers of UMSU. Data collection in this study used techniques (1) Observations were made by observing and tracing the activities and activities of all respondents as a whole in order to collect initial data. The observation tool uses a list / observation sheet that has been prepared in advance, (2) Interviews are conducted to collect in-depth information from informants, using a list of interviews that have been prepared in advance, (3) Documentation is carried out to collect data taken and available the results of field work.

III. Results and Discussion

3.1 Research Result

This research is a development research that aims to produce a model for developing lecturer competence in designing online learning. This research was carried out at the Master of Management Study Program of Postgraduate Higher Education Muhammadiyah University of North Sumatra Jalan Denai Number 217 Medan. The implementation of the development of the training model in this study is the application of the ADDIE model with the following stages.

a. Analysis

The analysis stage is a process of defining what learners will learn, namely conducting a needs assessment (needs analysis), identifying problems (needs), and carrying out a task analysis. At this stage, the phase divides into three segments, namely: analysis of learning participants, analysis of learning (including learning aims and objectives), and media analysis. Activities at the analysis stage to determine the components needed for the next development stage, namely: (1) determining the characteristics of learning participants; (2) analyzing the needs of participants in learning; (3) create a concept map based on initial research. Followed by designing a flow chart providing clear directions for product production; (4) determine the type of media to be developed; (5) analyzing the constraints found; (6) designing an assessment to test the competence of learning participants. Accuracy

in completing assignments, worksheets, quizzes, and others; (7) analyze the difference between web and regular classes; and (8) consider online pedagogy. Verbal, visual, tactical, auditory, etc.

b. Design

This stage is also known as making a design (blue print). The stages that need to be carried out in the design process are: first to formulate SMAR learning objectives (specific, measurable, applicable, and realistic). Then determine what appropriate learning strategies should be like to achieve these goals. In this case, there are many choices of combination of methods and media that we can choose and determine the most relevant. Besides that, also consider other supporting sources, such as relevant learning resources, what kind of learning environment should be, and so on. All of this is contained in a document called a clear and detailed blueprint.

c. Development

Development is the process of making a blueprint or design a reality. The first thing that is done in product development is to analyze system users and what things users can do and what things users can do on the system. At this stage, e-learning content is actually being produced. The content can vary greatly depending on the resources available.For example, e-learning content consists of only simple material (i.e. material with little or no interactivity or multimedia, such as a structured PDF document) that can be combined with other material (e.g. audio files or videos), assignments and tests. In that situation, media development and development storyboards and electronic interactions will not be carried out. The development of interactive multimedia content consists of three main steps: (1) Content development: writing or gathering all the required knowledge and information. (2) Development of storyboards: integrating instructional methods (all pedagogical elements needed to support the learning process) and media elements. This is done by developing storyboards, documents that describe all the components of the final interactive product, including images, text, interactions, assessment tests. (3) Courseware development: developing interactive media and components, producing courses in different formats for CD-Rom and Web delivery and integrating content elements into learning platforms that learners can access.

d. Implementation

Implementation is a concrete step to implement the developed learning system. This means that at this stage everything that has been developed is installed or set in such a way as to its role or function so that it can be implemented. The implementation stage in this study was carried out by directly trying out the media. Media testing was carried out in two stages, namely: the first stage of validity testing by subject content experts, learning media experts, learning design experts. The second stage of practicality testing by individual groups, small groups, large groups, and teachers of information and communication technology subjects. The results of this trial are used as a basis for carrying out the evaluation phase.

e. Evaluation

E-learning projects can be evaluated for specific evaluation purposes. You may want to do an evaluation of student reactions, achievement of learning goals, transfer of work related knowledge and skills, and the impact of the project on the organization.
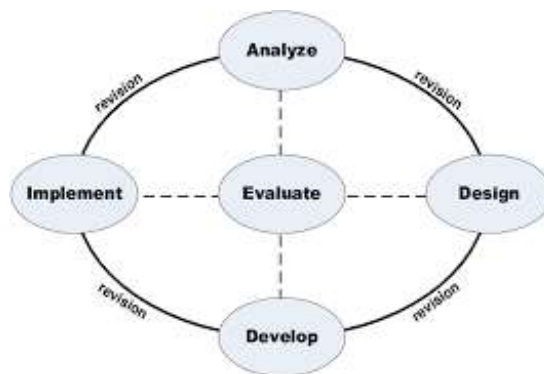
Figure 1. *HR Training Model*

The development of lecturers' abilities in designing online learning is carried out by means of training which aims to provide knowledge and technology on how to make e-learning and develop e-learning content. The software used as a manufacturing medium was MOODLE's LMS (Learning Management System) software which was open source based. While the training participants are UMSU higher education management master lecturers. The resulting online training program makes use of the MOODLE platform. The stages of training for lecturers in designing learning in e-learning can be seen in Figure 2, starting from defining the content or defining the product, the second stage is making instructional designs, the third arranges all material into all formats (documents, pictures, and so on), the 4th combines all content formats into an application (eg eXe, hot potatoes), and finally uploads the content into an e-learning platform such as Moodle.
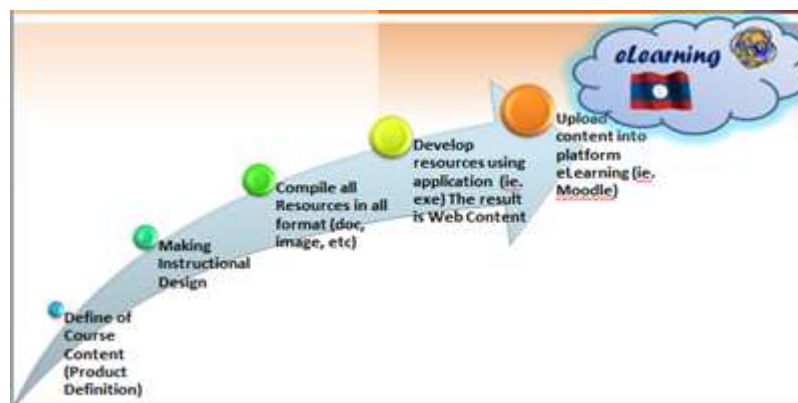

Figure 2. *Stages of Content Creation*

In the first and second stages, it will determine the success of the learning process as it progresses.

The MOODLE display design is modified as attractive as possible so that users feel comfortable using the e-learning portal. On the home page, menus and blocks are created that make it easier for users to access the e learning portal. Figure 4 shows the home page view of the UMSU e-learning portal and the content of the e-learning option categories of each faculty. UMSU's e learning content consists of various categories of e learning options in each faculty. Based on the faculty category content, students can choose various categories.

Figure 3. *Display of e Learning Content*

Every user who will access the contents of the e-Learning portal must first log into the system in order to access the menus that have been provided. User login is useful for managing user access rights in accordance with the authority set by the Administrator. To log in, you can go to the login menu on the main page (frontpage). Users can select the desired language, namely Indonesian and English. Adding users can only be done manually by the Administrator with the aim that the user can be controlled by the Administrator. The user access rights in the system are explained as in the following table:

Table 1. User Access Rights Section

User	Deskription
Gues	Guest users have read access rights and may be considered as observers
Students	Student users are participants in lectures and can access all lecture materials according to the courses being followed.
Teacher	This user is a teaching staff and is an admin in the subject being taught.
Administrator	Users with the highest rights and authority in the system.

The arrangement of lecture content packages is arranged in accordance with the rules for preparing the Content Aggregation Package. So that it is easily accessible and followed by students.

3.2 Learning Module

This stage is designing and making modules. This learning module is divided into two content aggregation packages, namely a summary of the computer system architecture and the computer organization module. In the summary computer system architecture is divided into 10 materials, while in the computer organization module it is divided into 7 chapters. All assets in this content aggregation package are in the form of text files in PDF format, so that students can directly follow them online and can be saved as independent study materials.

In general, e-learning content is developed according to learning outcomes which are summarized in several chapters, activities and media elements such as text, slides, documents, graphics, animation, audio, and video. Some forms of activities that can be carried out by students through e-learning are:

a. Read Teaching Materials (Slides and Tutorials) Online

This activity is expected to help students to more easily understand teaching materials. Students can easily read and access available reading sources.

b. Conduct Discussions and Do Assignments in Groups.

Based on Chickering (1987) in a paper that discusses "Seven Principles for Good Practice in Undergraduate Education", activities in the form of group discussions can improve student understanding of teaching materials. Discussions through online forums available in CMS are also believed to increase interaction between students.

c. Watch Videos Related to the Topics Provided By the Lecturers in the CMS.

The activity of watching videos can be done indefinitely and repeatedly. In e-learning, video is a teaching material that can be used to encourage and increase student motivation to be more independent and understand something new independently (movivation for self-study). Videos are usually packaged in an attractive and easy to understand manner.

d. Take Online Quizzes

One way to find out whether students understand the topics being taught is to ask them to answer online quizzes related to certain topics. Question forms can be multiple choice, matching, and true-false.

e. Tasks

Doing assignments for 2-3 weeks duration is an important activity in e-learning based learning methods. The distribution of assignments is given online and collection can also be done online through the e-learning system. Lecturers can assess and provide feedback online too.

f. Write a Short Reflection (Minimum 500 Words or Maximum 2 Single Spaced A4 Pages)

Reflection writing activity is part of e-learning to get feedback from students directly on the learning process and topic. Feedback is an important part of effective learning, especially online learning. Input from reflection can help lecturers understand the level of understanding of students and provide clear guidelines on how to make adjustments so that the level of student understanding increases.

g. Discussion and Communication via Forums, Chat, and Email

Discussion activities and interactions between students and students and between lecturers and students will be carried out through discussion forums, chat, or email. Chat is used to get answers quickly directly to the lecturer, while discussion forums and e-mail are used to solve an issue in the form of a joint discussion. The e-learning system for the UMSU higher education management master lecturers can be accessed through the UMSU website or directly at www.elearning.umsu.ac.id. Since it was first activated until now, Moodle is the e-learning platform used at UMSU. The UMSU e-learning system also uses responsive templates so that it can be easily accessed via PCs, laptops, tabs and cellphones. Figure 5 shows the front page of the e-learning system developed based on the results of training by the latest version of the UMSU Master of Education Management lecturers. The following shows the e-learning design of the e-learning development design for the UMSU Master of Higher Education Management lecturers.
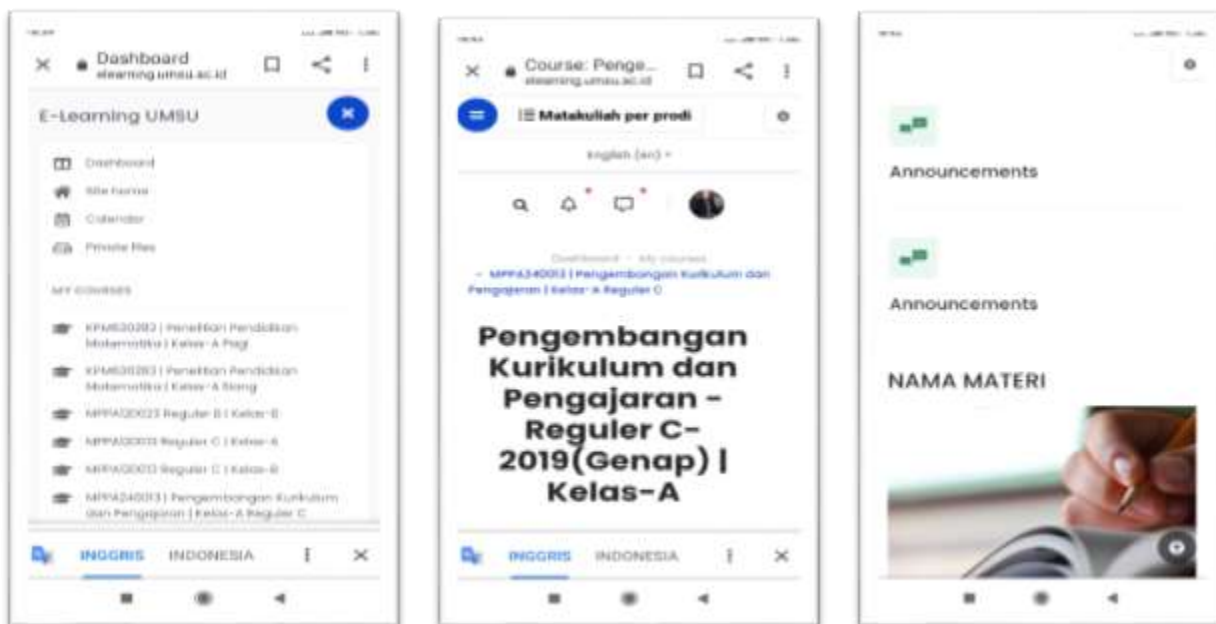
Figure 4. *Lecturer Creativity Content from Training Results*

In developing this online learning product, it involves experts consisting of content experts, namely experts related to the scientific field of the curriculum, and technical experts, namely experts who develop online learning programs. The two teams collaborate to produce programs that are considered good and effective in order to increase student motivation and learning outcomes. The final activity in developing the competence of lecturers in designing an e-learning portal is preparing teaching materials and evaluation materials as part of the e-learning material package that students will learn and understand. In compiling the package or material content, several stages are carried out, namely: 1) making Instructional Analysis, 2) developing teaching materials or modules, 3) collecting materials in accordance with the syllabus, and 4) writing learning material scripts.

There are three aspects that were tested in relation to the newly created e-learning portal, including: web design, learning materials, each aspect will be asked for responses to web design experts, material experts and evaluation experts. The trial product revision received several inputs, the navigation menu should be in bold, and the table should be given an attractive background color, the choice of language should be Indonesian, the teaching materials are easy to understand but the appearance is less attractive. The fonts in the teaching materials are too small. The initial appearance of the color is less attractive, more explained, the learning material can be received well. The picture teaching material is reproduced. After several subsequent inputs, field tests of various components both from the layout, system and teaching materials were improved as much as possible so that the e-learning portal approached the direction of perfection. Product development results after several revisions are made, the next step is to try out the students to find out the weaknesses or weaknesses of the results of the development of lecturers in designing the developed e learning learning.

3.3 Discussion

The model for developing lecturer competence in designing online learning resources is generally very effective in training lecturers' abilities and does not require too much money. Furthermore, this program is developed only to the ability to make competency maps for lecturers, e-learning designs and learning tools. Furthermore, to update the lecturer competency development model, continuous improvements need to be made, it will be suggested to lecturers outside the UMSU Higher Education Management Master Program to refer to the provisions of the LMS platform that have been set by each study program. This program also needs to be designed more effectively to make it more attractive by using the right illustrations. The results of the evaluation by IT experts who reviewed the online training program indicated that the program needed to revise the web interface, present material in the form of words, pdf, and powerpoint presentations to make it more coherent, easy to follow and interesting. The results of this study have not been able to identify the factors that support and hinder lecturers in producing SPTD because this program has not been implemented in all Study Programs at UMSU. Thus, the benefits of SPTD made by the lecturers cannot be identified in the training.
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IV. Conclusion

This research has produced a prototype open online training for lecturers specifically at the UMSU Master of Higher Education Management in developing open online learning resources (SPTD). This research was conducted by the author with the assistance of experts from the UMSU Computer Center who assisted in making online training program templates on the MOODLE platform. This prototype still needs to be revised so that it can function as a learning management system that can record all the actions of participants registering, accessing, and uploading assignments and discussions.

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