Content development of flipped classroom-based for microteaching course

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Abstract. This research was proposed to develop and generate a flipped learning based instructional media for the Microteaching course, to improve students' concept mastery and teaching skills. ADDIE was used as the research method to achieve the goal of this research, which consists of 1) analysis, 2) design, 3) development, 4) implementation, 5) evaluation. In the first step, the analysis of the system needs and the analysis of TIU/TK on the microteaching course based on the syllabus. In the second step, the design of flipped classroom-based microteaching content systematics and the design of system, database, and interface were carried out. In the third step, the development step was the following step of all that had been designed. The arrangement of microteaching content followed the syllabus and the integration into the learning management system by using Moodle. The implementation step was to insert the microteaching content into Moodle as the platform. In the evaluation step, several tests were carried out on the expert, including design expert, content expert, and media expert.

1. Introduction.

Teacher competence is a skill that must be mastered by a teacher, which involves knowledge, skill, and personality as a professional teacher. The competencies that must be possessed by a teacher in primary, secondary, and early childhood education level are pedagogical competence, character, professional, and social. A teacher is called an experienced teacher should possess teaching competencies such as opening and closing skills, questioning skills, reinforcing skills, teaching variation skill, etc. In the learning process, the teacher takes a role as a director and an actor. Those two roles are the main factor in determining the teaching and learning process in the classroom [1]. Teaching is an essential part of learning, and it is a necessary duty of a teacher. A teacher should master teaching competencies to be able to teach effectively.

Based on ministerial regulation number 55 the year 2017 about the teacher's standard education, microteaching courses should be given for diploma or undergraduate students with a minimum study load of 2 credits. Teaching and learning is the main activity in education. Therefore, the quality of education depends on teaching quality and student's capacity. The main task of the teacher is teaching, guiding, training, directing, assessing, and evaluating (Constitutional or the Republic of Indonesia number 14 the year 2005 on teacher and lecturer, article 2 verse 1). [2] For the prospective teacher, students who have sufficient teaching skills need to be prepared with the knowledge, skill, and positive personality. In reality, teaching skill is all of the teacher's activities in the classroom. Teaching skill is an activity to facilitate the student's learning process directly and indirectly to achieve the...
learning goal [3]. Microteaching is a course that is proposed for students to have teaching skills. This course is a requirement for students to get practical field experience conducted in a particular school. This course discusses the microteaching theoretical concept, basic teaching skill, how to create a lesson plan, and the implementation in training basic teaching exercises. There are eight basic teaching skill in the microteaching course, such as 1) questioning skill, 2) reinforcing skill, 3) variation skill, 4) explaining skill, 5) opening and closing skill, 6) small group discussion skill, 7) small group and individual teaching skill, and 8) classroom management skill.

The common microteaching learning nowadays is that the students come into the classroom and watch a teaching practice video and do discussions; in the next meeting, the students do a teaching simulation based on the teaching skill that has been discussed in the previous session. In the big class, the simulation will not be effective because the video and the teaching skill material can be learned at home. Also, the meeting can be used for more discussion and teaching practice. Through this research, the content development of flipped classroom-based for the microteaching course can be accessed online. Students can learn anywhere and anytime without any limit to maximize the teaching practice in the classroom. Flipped Classroom learning is a reverse learning process, which means the students can read and understand the material at home. Then the students can consolidate the teaching practice or do an in-depth discussion with the lecturer at the meeting. The flipped classroom is a reverse learning model in the 21st century. The flipped classroom is a learning innovation where the students learn the material outside the classroom individually, then do a discussion or active learning. The flipped classroom supports being used in this millennial era because of the rapid development of the internet and technology [4], in the implementation of Flipped Classroom learning content that uses a learning management system named Moodle. Moodle is the best LMS application in terms of features compared to the other LMS types. In this development research, Moodle is used to be a placing container for any course that will be packed through a friendly user interface depending on the teacher and student needs. Through any features and advantages of Moodle, e-learning that will be developed does not only show the text and picture of the material but also accompanied by the assistance of CIA media in a video tutorial, simulation, or drill and practice in every meeting. Various features of Moodle will be used, such as forum facility, assignment, quiz, chatting, and several Moodle’s facilities that can assist the learning process. The learning design interface in Moodle is developed by the researcher and for further learning in e-learning based on project-based learning.

Based on the explanation above, the researcher tries to develop a flipped classroom-based content microteaching course that can be accessed online so that the lecturer and students get more learning sources.

2. Method

This research was research and development (R&D). Research and development are a type of research that is used to create a particular product and test the effectiveness of the product [5]. This research produced a learning content for the microteaching course using ADDIE (analysis, design, development, implementation, evaluation) model. ADDIE model was used because this model was commonly used to visualize the systematic approach for instructional development [6]. The procedures of the ADDIE model can be seen in picture 1.
According to [7] stated that "there are five steps in the ADDIE model such as:

1. Analyze Step
In detail, the analysis of need or content and the analysis of software need was conducted.
   a. Analysis of Content Needs
      In this step, the analysis of course characteristics was carried out by analyzing the syllabus of the microteaching course.
   b. Analysis of Software Needs
      The need analysis in this step was proposed to analyze the functional and nonfunctional need, the analysis of system requirement, and the advantage of Moodle software

2. Design Step
In this step, the content design process and the development design of the software occurred.

3. Development Step
The development process in this step involves designing content, evaluating, Moodle developing, and other supportive microteaching media that have been measured based on the competence equipped with various teaching practice videos and its implementation with flipped classroom learning.

4. Implementation Step
During the implementation, there were several minimum requirements of software and hardware that required as follows
   a. Software Requirements
      1. Operating System: Windows XP Service Pack 3
      2. Internet Browser: Firefox, Google Chrome
      3. Adobe Flash Player
      4. Adobe Reader
   b. Hardware Requirements
      1. Monitor with 1024 x 728-pixel resolution
      2. 512 MB RAM
      3. Processor Pentium IV 3.0 GHz
      4. VGA Minimum VGA 128MB
      5. 1 GB Free Hardisk Space
      6. Sound card and speakers/headset

5. Evaluation Step
This step only used to occur the formative evaluation to gather the data of the media effectiveness and efficiency to achieve the goal. The data is supposed to improve and accomplish the media to be effective and efficient. The formative evaluation consisted of a content expert review, learning design expert, and expert media review. After the formative review, a field test was conducted to find out the students' responses.
2.1. Data Collection and Analysis Techniques
According to ADDIE steps, the next step after implementation was a formative evaluation that aimed to occur the effectiveness test toward the draft of learning software done through one-to-one assessment on the content expert, learning design expert, and media expert. The required instrument during the formative evaluation process. The instrument needed during the formative evaluation process can be seen in Table 1.

| Data Type               | Data Source      | Method     | Instrument                          | Time              |
|------------------------|------------------|------------|-------------------------------------|-------------------|
| Data for Formative     | Judges/expert    | One to one | Content & Language Questionnaire,    | After Draft       |
| Evaluation             | judges/expert    |            | Design Questionnaire, Media          | Development Finish|
|                        | Evaluation       |            | Questionnaire                        |                   |

| Data Response          | Students        | Field Test | Questionnaire                      | After Expert Judgement |
|------------------------|-----------------|------------|------------------------------------|-------------------------|

2.2. Setting
This research was conducted in Informatics Engineering Education, Faculty of Engineering and Vocational, Ganesha University of Education. The system development was conducted in LCI (Lab of Culture Informatics) of Informatics Engineering Education.

3. Finding and Discussion
The development of flipped classroom-based content for microteaching courses was proposed to prove online learning for students to learn individually, wherever and whenever, without any limitation, and to maximize the teaching practice in the classroom. Flipped classroom learning is a reverse learning process, which means the students could read and understand the course material at home, and when they meet with the lecturer, the students only need to strengthen their teaching practice. The flipped classroom is the best reverse learning model in this 21st century. The flipped classroom was a learning innovation where the students learned outside the classroom or learned individually at home, then did an active discussion in the classroom. The flipped classroom was supportive of being used in this digital era where the technology and internet were rapidly developed. According to [8] stated that problem-based learning in a flipped classroom is a problem-solving learning model in a flipped class that provides a learning video as a guide to solve the problem that might be appeared in the classroom. In the implementation of the flipped classroom on the learning process, several steps should be considered such as 1) Before class, at first students needed to access Moodle before the course was started, wherein this step, students should download the application and learn the material given in Moodle. 2) During class, in this step, students were guided to do a simulation depend on the topic of the meeting that had been learned before. In this step, the lecturer keeps guiding the students who did the teaching practice. 3) After class, in this step, the students were guided to access Moodle again to do the evaluation sheet, which contained several questions based on the meeting.

Flipped classroom learning used more learning videos, which gave a chance for students to learn wherever and whenever [9]. The video could be repeated until the student understood the material. The flipped classroom provides what was generally done in the classroom and what was typically done as the homework, then it is reversed. Previously, students came to the class and listened to the lecturer's explanation, and then they went back home to finish their homework. Now, students read the
material, watched the learning video before they came into the classroom and they started a discussion, sharing, solving the problem with other students or the lecturer, trained the student to develop their fluency, inspire and help them with the challenging project through giving more learning control [10]. Content development for the flipped classroom-based microteaching course using Moodle, Moodle is an abbreviation of Modular Object-Oriented Dynamic Environment, which meant a dynamic learning environment using an object-oriented module or web-based learning environment and developed with an object-oriented concept. Moodle has various useful facilities to support the learning process, such as a) Assignment used to provide the assignment to online learning participants. The participant could access the assignment and submit it by sending their files. b) Chat used by both lecturers and participants to interact with each other through dialog chat. c) Forum was used to do online discussion between the lecturer and learning participant, which discussed the topics related to the learning material. D) Quiz was used by the lecturer to conduct the online test. E) Survey was used to conduct polls.

The e-module in this research would be developed using Moodle software. Moodle is the best LMS application from the features compared to other LMS. In this development research, Moodle functioned as a container for placing various learning materials, which would be packed with a friendly user interface depending on teacher and students' needs. By various Moodle features and advantages, e-module that would be developed not only show the text and pictures material, but also accompanied by the assistance of CIA media in the form of video tutorial, simulation, drill, and practice in every meeting. Various Moodle features would be used, such as a forum, assignment, quiz, chatting, and other facilities that support the learning process. The researcher developed the interface of learning design in Moodle and for the learning steps in the e-module based on project-based learning.

The content development for the flipped classroom-based microteaching course using the development steps of ADDIE. 1) Analyze, in this step, the analysis of content needs and software need to have occurred. The course characteristic analysis was conducted in the content need analysis by analyzing the syllabus of the microteaching course. The software need analysis was proposed to analyze the system requirement and the advantages of Moodle software. 2) Design, in this step, content design and software development design were carried out. 3) Development, in this step, the arrangement of content, evaluation, Moodle development, and other learning support features needed by the lecturer and students were carried out. The result of the development step was a media for a microteaching course that had been arranged based on the applicable competence equipped by various teaching skill videos and its implementation with a flipped classroom learning model. 4) Implementation, during the implementation, there were several minimum requirement specifications for software and hardware such as a. software requirement: 1. Operating system: Windows XP service pack 3, 2. Internet Browser: Firefox, Google, Chrome, 3. Adobe Flash Player, 4. Adobe Reader. For the hardware requirement, such as 1. Monitor with 1024x728 pixel resolution, 2. 512 MB RAM, 3. Pentium IV 3.0 GHz processor, 4. Minimum VGA 128 MB, 5. 1 GB Free Hardisk Space, and 6. Sound Card and Speaker / Headset. Then in the last step, 5) Evaluation, where the formative evaluation occurred to gather the data of the effectiveness and efficiency of the media to achieve the goal. Those data were intended to improve and refine the media to be more effective and efficient. The formative evaluation consisted of a content expert review, learning design expert, and expert media review. After the formative test, then the field test occurred to determine the students' responses.

The data collection technique and data analysis in this research was following ADDIE steps. After the implementation, the next step was conducting the formative evaluation to occur the effectiveness test on the learning tool draft produced through one-to-one evaluation of the experts (content expert, learning design expert, and media expert). The instrument was needed during the formative evaluation. This research was conducted in the Informatics Engineering Education department, Faculty of Engineering and Vocational, Ganesha University of Education. The system development was conducted in LCI (Lab of Culture Informatic)
Table 2. The Result of Content Development.

| No | Content Name                     | Development Result |
|----|----------------------------------|--------------------|
| 1. | Home Page                        | ![Home Page Image]  |
| 2. | Introduction Page                | ![Introduction Page Image] |
| 3. | Problem Orientation Learning Activity Page | ![Problem Orientation Image] |
| 4. | Project Compilation Learning Activity Page | ![Project Compilation Image] |
| 5. | Investigation Learning Activity Page | ![Investigation Image] |
4. Conclusion

This research produced Micro Teaching Course content which was divided into 10 learning activities. (1) The first learning activity was Course Contract which aimed at giving an early picture of the course. (2) The second learning activity was Micro Teaching Characteristics. (3) Questioning Skill. (4) Giving Reinforcement Skill. (5) Conducting Variation Skill. (6) Explaining Skill. (7) Opening and Closing Course Meeting Skill. (8) Leading Small Group Discussion Skill. (9) Teaching Small Group and Individual Skill. (10) Class Management Skill. Thus, the following research phases were expert judgment and field tests to obtain users’ responses.

References
[1] Hasan S 2008 Kompetensi Minimal seorang Guru dalam Mengajar Tabularasa pp. 23-34
[2] Wahyuni D S, Agustini K, Sindu G P and Sugihartini N 2019 Analysis on Vocational high school teacher competency gaps: implication for VHS teacher training needs Journal of Physics: Conference Series 1516 1-11
[3] Safitri E 2016 Keterampilan mengajar guru dan motivasi belajar siswa sebagai determinan terhadap hasil belajar Pendidikan Manajemen Perkantoran pp. 144-153
[4] Zainuddin Z 2017 Flipped Classroom Literasi Digital pp. 1-2
[5] Sugiyono 2017 Metode penelitian pendidikan pendekatan kuantitatif, kualitatif dan r&d (Bandung: Alfabeta)
[6] Putrama M, Kesiman M W A, Sugihartini N and Damayanti L P E 2019 Developing Jobsheet for basic programming based on performance assessment Journal of Physics: Conference Series 1516 1-8

| No | Content Name | Development Result |
|----|--------------|--------------------|
| 6. | Planning Report Page | ![Planning Report Page](image) |
| 7. | Presentation Report Page | ![Presentation Report Page](image) |
| 8. | Learning Evaluation Page | ![Learning Evaluation Page](image) |
[7] Tegeh I M, Jampel I N and Pudjawan K 2014 Model Penelitian Pengembangan (Yogyakarta: Graha Ilmu)

[8] Utami S 2017 Pengaruh model pembelajaran flipped classroom tipe peer instruction flipped terhadap kemampuan pemecahan masalah matematika siswa (Jakarta: Fakultas Ilmu Tarbiyah dan Keguruan)

[9] Agustini K, Sugihartini N, Sudirtha G, Gading K, Widiana W and Laraswati S 2017 The relationship of time management and smartphone using for learning source on students achievement Journal of Engineering and Applied Science 12 7409-7415

[10] Damayanti H N and Sutama 2016 Efektivitas Flipped Classroom terhadap sikap dan Keterampilan Belajar Matematika di SMK Manajemen Pendidikan 11 15-22