Interactive Multimedia to Improve the Students' Ability of Teacher Training and Education Faculty in Learning Strategy Course

Heni Rita Susila, Suyitno Muslim and Zulfiati Syahrial

Abstract--- Learning strategy is a crucial subject matter for students of teacher and education faculty, they need this course in the order they can choose the right strategy in designing an instructional class. Moreover, they have to pass this course before getting microteaching and practical teaching at school. This study was a research and development (R&D) of interactive multimedia for learning strategy course. The method study refers to the steps of Alessi & Trollip which are conducted through three phases, planning, design, and development. In this learning, students learn the material from the book collaborated by watching interactive multimedia before discussion in the classroom. In the classroom students discuss, solving some problems and doing simulation by lecturer guidance. This learning model was built and validated by professionals and students. Five experts were engaged to assess this model. Experts stated that this model was valid and set to put into practice. To see the effectiveness, pre-test and post-test were performed for students, and the result showed that it can increase learning outcomes. The conclusion is this model was effective in improving students' achievements in the learning strategy course.

Keywords--- Interactive Multimedia, Instructional Model, Learning Strategy, Multimedia Learning, Research and Development.

I. INTRODUCTION

Students' engagement in technology has become stronger nowadays. The fast-developed information and telecommunication technology and easier access to the internet worldwide have enriched the teaching and learning method (Tian, 2018). Technological applications can be applied effectively to help improve students learning (Schunk, 2012). Numerous studies of multimedia or learning based on the computer have been conducted, to prove that the application of technology contributes effectively to improve student learning outcomes. A study in Malaysia stated that the learning process using multimedia improving student individual responsibility and interpersonal communication (Neo, 2012) and research conducted in Yogyakarta State University showed the students got higher achievement scores compares to students with non-multimedia learning (Surjono, 2015). Multimedia coaching is useful in imparting reasoning skills, psychomotor skills and it unites the retaining of learning substance (Rajendra & Sudana, 2018).

Education and teaching Faculty in Baturaja University is a faculty for a prospective teacher. Every student will apply their teaching skill at school. Learning strategy course is a very important subject matter for provision in raising students' skill in teaching. learning strategy course allows students to understand the concept of learning and

Heni Rita Susila, Program Pascasarjana Teknologi Pendidikan, Universitas Negeri Jakarta, Jakarta, Indonesia.
E-mail: henirietta99@gmail.com
Suyitno Muslim, Program Pascasarjana Teknologi Pendidikan, Universitas Negeri Jakarta, Jakarta, Indonesia.
Zulfiati Syahrial, Program Pascasarjana Teknologi Pendidikan, Universitas Negeri Jakarta, Jakarta, Indonesia.

strategy and use various learning strategies in teaching. Students skill as a teacher perspective especially in choosing the appropriate strategy, in communicating and interpersonal skills. Some problem faced by a lecturer in instructional strategy is limited time to explain the material while students need to simulate their understanding of this knowledge in a group. The simulation needed more than 6 meetings, where for one semester only have 14 meetings. The learning process using technology needs to be designed to solve the problem of limited teaching time. Interactive multimedia was chosen because of the university located which can't access the internet properly. The objective of doing this research is to evaluate the interactive multimedia instructional model for learning strategy courses. The next objective is to analyze the model validity based on the results of the evaluation. The last objective is to understand the efficacy of an interactive multimedia instructional model for learning strategy module.

II. LITERATURE REVIEW

Interactive Multimedia

Multimedia is a woven mix of carefully controlled content, photos, realistic craftsmanship, sound, movement, and video components. When you permit an end client otherwise called the watcher of a sight and sound task to control what and when the components are conveyed, it is called intelligent mixed media (Vaughan, 2008). According to Vaughan's opinion above, point interactivity of multimedia is there is an interaction between users and multimedia, it marked by the controller so that the users are free to select the menu according to what is desired for the next process.

The advantage of multimedia is to attract the senses and attract interest because it is a combination of views, sounds, and movement (Deliyannis, 2012). The combination of various elements in multimedia is expected can provide a concrete learning experience. Multimedia according to art or educational system is the utilization of various media utilized for articulation or correspondence and the presence of a dynamic client state or substance adjusting ability (Schwier, 1993). The terms expressions and communication explicitly indicate the existence of an interactive process, communication here is assumed as a process of interaction between the two parties who exchange information, mutually evolving and changing.

Learning Strategy Course for Students of Education and Teacher Faculty

Smaldino explained that strategy as a teaching procedure was chosen to help students reach their goals or internalize content (Smaldino, 2014). The strategy is a general teaching approach that applies in various fields of material and it is used to reach various learning objectives. The teaching strategy plays an important part in the effectiveness of teaching (Liu & He, 2014). In planning a strategy many components are involved, such as content, learning outcomes, teaching experience, technology and media, learning environment and people. teaching strategies chosen by a teacher greatly influence student learning outcomes (Smaldino, 2014). So the ability of a teacher to understand and apply a learning strategy has a significant influence on students. The Learning Strategy course is a compulsory subject at the education and teaching faculty of Baturaja University. This course was born to strive to realize the profile of graduates of professional educators. The competency of graduates or PLO (Program Learning Outcome) is expected to be able to design, manage and implement learning. The Course Learning Outcome (CLO) expected from this course is that students are able to describe the basic concepts of learning strategies, describe

approaches in learning, describe methods in learning, describe types of learning strategies and apply these learning strategies by doing a simulation in the group.

III. METHODOLOGY

This study used the R&D study method from Alessi & Trollip found in the book entitled Multimedia For Learning: Methods and Development (Alessi & Trollip, 2001). Innovative work (R&D) is a procedure that reviews the requirement for customer pursued by the improvement of an item that will address the issue. The reason for the innovative work in training isn't to test the legitimacy of a hypothesis, yet to create items (showing materials, instructional media, the executives frameworks, and so forth.) that would be powerful in the field of instruction (Wibawa, 2014). Collection data gained from document analysis, interviews, questionnaires, and tests. In this study, the validity of the instrument was done by getting experts' evaluation. There are two experts, first is a person believed to have expertise in the field of research method, measurement and education technology and expert in the field of instructional especially about learning strategy. The reliability of the instrument was done by test-retest reliability. the test was done twice with two-week intervals. In alpha testing, the product validated by six experts, namely instructional design expert, multimedia expert, printed media expert, content expert, language expert. They suggest some feedback and revision. In the beta test, one to one evaluation and a small group evaluation was done. After that, a group of 23 students then used the learning model for eight meetings. The pre-test and post-test did analyze and find the effectiveness of the model. The score of the pre-test and post-test were analyzed using the t-test to compare the average score of pre-test and post-test.

IV. RESULT AND FINDING

Alpha Testing

In alpha testing, we did a one-to-one evaluation with experts. This evaluation gave a lot of inputs in improving the instructional material. Some revisions were done to make sure that all the products in this instructional material are valid to be used. The revisions did in the syllabus, book, guidebook and interactive multimedia. All these revisions were done to ensure that the material is valid to be used. We have two content experts in this study and they recommended some revision to improve the developed material. Such as; (1) adding the number of exercises for every chapter; (2) making a group of discussion so the students would be able to work together and have discussion; (3) adding glossary not only in the printed book but also in multimedia; (4) expanding material in chapter 9 about cooperative learning and adding a video in this chapter. Instructional design experts gave some recommendation such as; (1) doing some revision in objectives using ABCD Formula (Audience, Behaviour, Condition, and Degree) and put the competency map in every chapter in the book by giving sign in the column being discussion; (2) repairing the flow of the competency map, use horizontal line for the equivalent ability; (3) the color of the book must be consistent between the cover and outline in the content; (4) adding the text for some part when narrator speak to make the material clearly; (5) providing more picture will make the book more interesting but must be copyright picture. Language expert has some recommendation to improve the developed instruction material, generally, there is grammar error, for example, the use of di must be distinguished as a preposition or as an affix. The writing text must refer to PUEBI. Multimedia Expert gave some recommendation, such as; (1) laying animation

should not interfere with the material, when it only functions to beautify the display not to explain the material; (2) all multimedia elements should be balanced, adding a video will complete the multimedia; (3) the sound of the video need to be more louder or it can be added text to make the message more clearly; (4) there must be a choice button to use or stop the music; (5) some links don't work properly, they must be repaired. Printed media expert evaluated the printed product like book and guidebook. He gave some recommendation such as; (1) the book and guidebook should not be too textual, providing more pictures or diagrams will make them more attractive; (2) font size for title, subtitle, and contents must be proportional and font type is better using san serif style like Arial, Calibri, Tahoma, Verdana not times new roman.

Beta Testing

In beta testing, we did one to one evaluation by students and a small group. Students are selected based on high, medium and low ability criteria, the selection of this capability category is based on lecturer recommendation. From one to one evaluation we have some inputs, such as; (1) the instructions for the exercises in the multimedia product are still not clear; (2) the multimedia product and student guidebook need to be more colorful. In general, students like to learn using this model because they can learn independently, besides that the material is easily understood. In small group evaluation, we choose 6 students and distributed the questionnaire and conducted an interview. From the questionnaire we got an average score of 3, 93 indicating they like this learning model. The results of interviews with the six students started learning with interactive multimedia is fun and easy to be understood. The display on the screen, video, and animation in interactive multimedia are interesting but it needs to reduce foreign language terms. Generally, they like to use interactive multimedia in learning instructional strategy courses and this learning model needs to be continued by lecturers.

Students	*Score*	*Average Score*
High	4,18	
Medium	4,00	3,93
Low	3,62	

Field Trial

A field trial was conducted on 23 students who took courses in learning strategies. The effectiveness of this learning model would be measured by comparing the results of the pre-test and the post-test. Pre-tests were given before the class to measure students' prior knowledge. Then the learning process takes place using an interactive multimedia learning model. Post-tests were given to measure students' abilities after studying use this learning model. Questionnaires were distributed to get information about students' improvement in learning. From the paired t-test, we got the value of t = 10.186 which is bigger than the value of t table $(\alpha, n-1) = 2,07$ based on the significant degree of 5% which means that the average scores of the post-tests are higher than the average scores of the pre-test.

V. DISCUSSION

In this learning model, students learn using interactive multimedia, book, and guidebook as media. Lecturer used Edmodo learning and WhatsApp group to coordinate students. The lecturer prepares the material at Edmodo and gives instructions to the students to download the material. The material is available in the form of a PDf book, interactive multimedia, and Edmodo. But geographical conditions in Baturaja make not every student could access

the internet easily. Paying attention to students' problem about limited conditions in accessing the internet, Lecturers provide material in the form of printed books and interactive multimedia which are available transferred through the flash disk, it gave when at classroom meeting. Students prepare themselves by studying the material outside class, so they have a chance to repeat the material freely according to their capability level.

This method helped them to understand the material easily. In the classroom, students discuss and explain the material by doing presentations and simulations. By using this model, it helped in shorting lecturer time in delivering material in the classroom so that students can use most of their meeting class time to do the simulation. Multimedia is also helpful to a lecturer as it provides many benefits for example, fulfilling instructive targets, expanding understudies understanding, exhibiting occasions, appearing, leading trials in most possible ways (Thamarana S, 2016).

According to Mayer in Interactivity effect, people learn better when they have control over the pace of the presentation (Mayer, 2009). After studying using this learning model students stated that they feel more excited about learning because of feedback in multimedia and they can do something like repeating the material, repeat the test until they get a score that they expect. It proved that multimedia and technology help the lecturer in a better learning process. As explained by Bull that the use of teacher-made interactive digital learning materials could revolutionize educational presentation (Bull, 2013). However, Media based technology used in the learning process does not have to be created or developed by lecturers.

By utilizing intelligent interactive media learning materials, understudies can be persuaded to learn, in light of the fact that they can tune in to sound, watch the video or view the content, movement, and illustrations at the same time (Ampa, 2015). From the questionnaire, the result showed that on average students feel excited learning to use interactive multimedia because they can see some video or animation to simulate the content. The field trial result also proves that there was an improvement in students' learning achievement before and after learning using this model.

This improvement happened because students have much time to do preparation before class, and the lecturer always controlled to see the deep of students' knowledge by asking them in class. lecturers also keep guiding and monitoring so that students can simulate the content properly.

VI. CONCLUSION

Learning Strategy Course is an important course for a teacher candidate, especially for students of teacher and education faculty. The instructional model of Interactive multimedia was developed and a formative evaluation was done to see the validity of the model. In this study formative evaluation using a terms alpha testing and beta testing. Product of this model were books, interactive multimedia, video and students' guidebook. Students made preparation by themselves first before studying in the classroom by watching and doing some interaction with multimedia and video. In the classroom, students explained their knowledge by doing a presentation in a discussion group and simulation. Lecturer's role in the classroom only as a facilitator and guide the learning process. The effectiveness of this model was measured by doing pre-test and post-test. The result showed that this learning model help students in reaching the instructional goal.

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