The Development of Instructional Video to Illustrate Teaching in a Real Learning Environment

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Abstract— The State University of Surabaya yield the teacher candidates who are having four standards of competencies namely pedagogy, personality, social, and professional competence. Teacher competencies are taught through courses to complete teaching plan and be able to teach with innovative learning model. The aims of this study were to (1) develop learning video about how teachers teach with innovative learning model, (2) determine how the students' responses after watching the video, and (3) determine achievement of standards of professional and pedagogy students competence. The samples of this study were 30 students. The data is collected by using video validation sheets, observation sheets of teacher competence in the field of pedagogy and professional, and student responses questionnaire to the video; and it were analyzed descriptively. The result indicated that (1) there were three instructional videos, which are direct learning model (DLM), cooperative learning model (CLM), and problem based learning model (PBLM). These videos have been validated by the two experts, and it was feasible in learning; (2) the DLM, CLM, and PBLM are good; (3) about 53% students' achievement are very good. There were many opportunities for future studies to seek greater insight into the benefits of lecturer-created course videos, who could help students to illustrate how teaching in a real learning environment

Keywords— instructional video; direct learning model; cooperative learning model; problem based learning model.

I. INTRODUCTION

Teaching is not only delivering of course material, but also a changing process of the students' behavior in accordance with the expected goals. Therefore, a teacher needs to teach, to guide, to educate, and to develop their potential students. Teachers should be able to design and to implement a variety of instructional models, media, and learning resources to enhance the learning effectiveness.

Using videos in teaching is not new. There are four areas: (a) the variety of video formats, (b) the ease with which the technology can facilitate their application in the classroom, (c) the number of video techniques an instructor can use, and (d) the research on multimedia learning that provides the theoretical and empirical support for their use as an effective teaching tool

A major assumption of the cognitive learning model is that a learner's attention is limited and therefore selective. With more interactive and richer media available, a learner who prefers an interactive learning style has more flexibility to meet individual needs [1]. Based on this, we assume that an instructional method that provides a video instructional should be more effective. According to [2], the teacher as a professional job needs a variety of conditions, such as: (1) professional work is supported by a particular science in depth and only obtained from educational institutions as appropriate, (2) a profession stressed to a certain expertise in specific areas according to the type of profession, (3) the level of skills and expertise of a profession based on educational background they experienced and recognized communities, and (4) a profession other than required by the public also has an impact on the social work profession resulting from it.

Several aspects of instructional video in class have not yet been well investigated. A problem with the use of instructional video has been lack of interactivity. The teacher need multimedia such as instructional video, who can help students to illustrate how teaching in a real learning environment. The learning video that has been made before is not only for electrical materials but also for other subjects Students also get an understanding of the syntax of Learning Model. Therefore, it is necessary to develop learning videos according to electrical materials by using innovative learning model. This learning video is also required in teacher training program. How is the feasibility of pictures, audio, and video contents? How to achieve pedagogical and professional competence students as professional teachers? How are student responses to the instructional video?

This study aims to determine: (1) feasibility electro material, the syntax and technology of video learning, (2) students achievement of pedagogy and professional competence as a teacher modeling, and (3) student responses on the instructional videos? The purpose of this study is specifically to develop instructional videos of DLM, CLM, and PBLM for Circuit Digital Electronics, and lessons plan.

II. INSTRUCTIONAL VIDEO

Learning resource is a necessary material of teachers and students in the learning process. Learning resources can be text books, printed media, electronic media, informants, the surrounding natural environment, which can increase the levels of activity in the learning process [3]. Instructional media is a source of learning for the transformation process information [4]. Instructional media is a means to motivate students learning. Electronic media such as computers, TV, radio, and video player is the result of engineering technology [5].

A video can be integrated with other media, such as graphics and text. Some of the advantages of video media is a a moving pictures, a drama which can show a process in sequence, can record images phenomenal as earthquakes, accidents and so on, including learning skills that can be observed repeatedly, affective learning, problem solving, cultural understanding [6]. Thus instructional video can be linked electronically with the curriculum, students in laboratory practice, or with teachers who are teaching in the classroom, video Allows one to enter the world of the classroom without having to be in the position of teaching in-the-moment and to manipulate that world in ways not possible without the video record [7]. A video can have a strong effect on your mind and senses. The beneficial aspects of videos also include attention-grabbing moving images, easy and repeated access to content, and the capability of modeling different ways to explain the same content [8].

The development of technology has an important role in learning, which can help teachers teach, the material presented to be interesting, and easy to understand, as shown in the following figure.

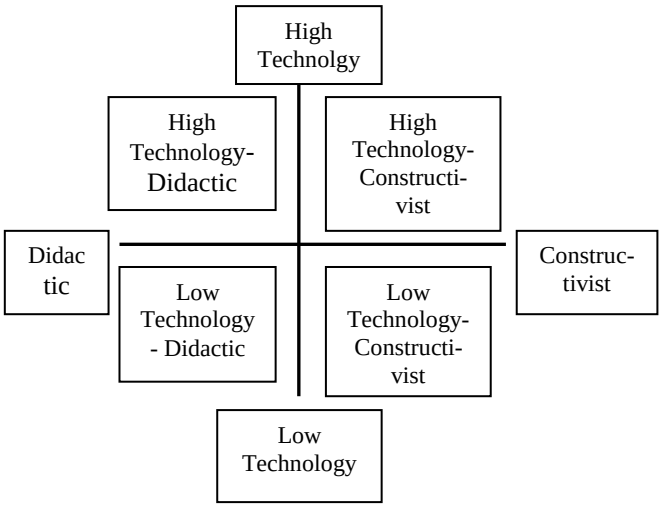

Fig. 1. Pedagogy-Technology Framework [9]

Some students have benefit from video are: (1) provides time and location flexibility; (2) results in cost and time savings for educational institutions; (3) fosters self-directed and self-paced learning by enabling learner-centered activities; (4) creates a collaborative learning environment by linking each learner with physically dispersed experts and peers; (5) allows unlimited access to electronic learning material; and (6) allows knowledge to be updated and maintained in a more timely and efficient manner.

There is a benefit program that students can see the video over and over again, can be stopped and observed carefully, can be brought forward and pushed back to repeat the necessary information. Other than that, the video can be collected, edited, and reorganized again. Video allows students to view actual objects and realistic scenes, to see sequences in motion, and to listen to narration. What is the learning value of video in the classroom? There are potential outcomes: a) grab students' attention; b) focus students' concentration; c) foster deeper learning; d) create a sense of anticipation; e) draw on students' imagination; f) stimulate the flow of ideas; g) build a connection with other students and instructor; and h) Make learning fun. Videos are believed to capture a student's attention more effectively than other media.

Lectures who conducted using lectures, discussions, and giving the task called DLM (direct instructional models). DLM based on the principles of behavioral psychology and social learning theory, especially on modeling (modeling). DLM is designed to help students to obtain procedural knowledge, ie knowledge that is structured and can be taught step by step [10]. DLM, describe the interaction of teachers and students is quite intensive, both in the classroom and in the laboratory.

CLM is a teaching technique that is used to help students learn the basic skills to problem solving [11]. Characteristic of cooperative learning is students working in small groups of heterogeneous and students are expected to help each other learn among friends. The classes are not quiet, but more student-centered activities, consists of several techniques, including STAD, Jigsaw, NHT, and CIRC.

PBLM grow and develop high-level thinking skills in problem-oriented situations, including learning how to learn [12]. Mohamad Nur describes some characteristics of problem-based learning is emphasized in the submission of the question or problem, focusing on interdisciplinary, authentic inquiry, produce and showcase the real work, and collaboration. Schaap [13] states that the development of professional competences is the main objective of a competence-based vocational education. Learning is viewed as giving meaning to experiences in a process of continuous progressive re-contextualisation.

The results of Heinich, Michael & James [14] surveys states that 90% of teachers have access to the video in the classroom, and the survey stated that 29% of teachers are using video more often than others, while 50% of teachers use video once in a while . Another study describes the level of student satisfaction with the learning model of synchronous hybrid e-learning is 72% very satisfied, while others are satisfied and all state satisfied. Learning with face-to-face 53.8% said very satisfied, but only 2.3% are not satisfied [15].

III. METHODOLOGY

This type of research is the development of research refers to the 4D models are defined, design, develop, and disseminate phase [16]. Development of instructional video, consisting of

direct learning model, cooperative learning, model, and problem based learning model, for subjects that AC Circuits, Digital Electronics, and lesson plan in the Department of Electrical Engineering Education.

The sample was students in the second semester of 2012/2013, Communication Electronic students of year 2011 who took the course of lesson plan.

1. Define stage is the stage of determining the format and substance of the product (essential topics of a course). In this study is done through five sub-phases, such as front end analysis, leaner analysis, task analysis, concept analysis, and specifying instructional objectives. The problems found in the course of lesson plan was required instructional video to explain how to implement a learning model. Students need to see an example or illustration of how the modeling of teachers in applying electrical engineering lesson in the classroom or laboratory. The material consists of competency standards, and basic competence of AC Electric Circuits, Digital Electronics, and lesson plan subjects. Essential concept compiled based vocational curriculum, and they needs of the workforce, and the development of science and technology. Lesson plan material are consists of the direct instructional model (DLM), Cooperative Learning Model (CLM), and Problem Based Learning Model (PBLM).
2. Design stage consists of the preparation of the tests (Construction of criterion-referenced tests), the selection of media (media selection), selecting the format (format selection), and the initial draft. The instruments of data collection are a video validation sheet, observation sheets for student competence as a teacher model, and questionnaire to measure the students' response in viewing the video lesson. The development of instructional video begins with selecting the essential topics of the course, and making a synopsis and treatment as a pre-production stage, and then preparing a draft master to facilitate the cameramen to take pictures.

Develop stage is the stage of production, consisting of expert judgment and field trials. At this stage, all the learning materials and synopsis should be validated and reviewed by experts in the field of media, and electrical fields to determine (a) the concept of truth, (b) learning objectives, (c) the quality of the sound, (d) the quality of pictures and other illustrations, (e) the relevance of the task with the goal of learning, and (f) the quality of the layout. Furthermore, synopsis and scenario, as well as learning the revised based on feedback and results of the validation. Students are trained casting in order to know his role by learning scenario. The final stage is develop instructional video editing picture and sound. Then the results will be seen and observed validators and researchers. Trial stage is playing the video to find out the students response of product feasibility.

IV. FINDINGS

This research has produced three instructional videos, such as videos Direct Learning Model (DLM), Cooperative Learning Model (CLM), and Problem Based Learning Model (PBLM).

TABLE I. RESULT OF VALIDATION LEARNING VIDEOS

No.	Aspect	Validator 1	Validator 2
A.	**Video**		
	1. Interest in video	4	5
	2. Suitability size picture	4	4
	3. Art of shooting	4	4
	4. Animations or text	3	3
	5. Type of text (font)	3	4
	6. Illustration is presented in a clear, interesting and easy to understand	4	3
	7. Sharpness picture	5	4
	8. Contrasting colors in the picture	5	4
	9. Understanding Electrical engineering materials	4	3
	10. Understanding the material Education	4	3
B.	**Audio**		
	1. Clarity of speech player	4	4
	2. Vocal player	4	3
	3. Conformity musical illustrations	4	4
	4. The Indonesian Spelling	4	3
	5. The sound of music	4	3
C	**Content**		
	1. The Electrical content	4	5
	2. The content illustrates a particular learning model	3	4
	3. The role of major players	4	4
	4. The role of supporting player	4	4
	5. Conformity content with duration	4	4
Total		79	75
Average		3,95	3,75

The validation video done by two experts with the average of video aspect of the picture, sound, and video content of the story, and the obtained value of 3,85 with interesting criteria. The lowest value 66 for pretest and 50 for posttest, score. Four students got highest in pretest and five in posttest.

TABLE II. THE STUDENTS' ACHIEVEMENT OF VIDEO LEARNING

Students	Score	
	Pretest	Posttest
1	80	75
2	70	80
3	70	50
4	65	70
5	80	65
6	80	50
7	50	80
8	75	70
9	70	70
10	70	60
11	60	60
12	75	65
13	65	75
14	55	80
15	50	80
16	50	55
17	70	70
18	65	80
19	60	75
20	75	80
Total	1335	1390
Average	66	70

Furthermore, the results showed that the observation of students to instructional videos on the DLM gained an average of 25.3 instructional videos of CLM is 30.1, while the average of PBLM videos is 29.6. Student's achievement of pedagogy and professional competence as a teacher modeling earned very good 53%, and the remaining are good

TABLE III. THE RESULT OF VIDEO OBSERVATION

Students	Skor		
	DLM	CLM	PBLM
1	26	31,5	28
2	30	28	31,5
3	22,5	31,5	28
4	22,5	35	28
5	26	28	31,5
6	26	35	28
7	26	28	28
8	26	31,5	31,5
9	26	28	35
10	26	24,5	28
11	22,5	31,5	31,5
12	26	28	28
13	30	31,5	31,5
14	22,5	35	28
15	26	28	28
16	26	35	31,5
17	26	28	28
18	22,5	31,5	28
19	26	28	31,5
20	22,5	24,5	35
Total	507	602	598,5
Average	25,35	30,1	29,9

V. CONCLUSIONS

Video incorporates multimedia resources, including text, images, sound, and speech, that when integrated effectively, form a powerful teaching and learning tool. Learners become active in the video learning environment, able to pause, stop, skip, and/or rewind sections to review problematic content until understanding is achieved. In another word, video delivery of content allows students to choose what to watch, when to watch, and where to watch. Video is also believed to have a nurturing value for instruction and to serve as an effective way to motivate learners, maintain their attention, and provide learning satisfaction.

Survey feedback indicated that students valued and used the videos and were hopeful that other lecturer would begin to adopt them as well. To conclude, all learning videos are feasible to use in learning. Pedagogy and professional competence showed 53% of students have scored very good. The average of response of students to instructional videos of DLM about 25.3 and 30.1 for video of CLM, while 29,6 for video of PBLM.

The development of a video that takes a long time and tiring. Therefore, it needs to control the time, and students who are involved need to exercise. Experts needed for shooting and editing the video so that it matches synopsis and treatment that have been prepared.

Clearly, there are many opportunities for future studies to seek greater insight into the benefits of lecturer-created course videos. Understanding how shared online video might be effectively used in conjunction with such technologies should prove highly valuable in years to come as technologies converge and lecturers continue to make better use of them.

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