Development of Video with Discovery Learning Models as a Reference for Teachers in Implementation Curriculum 2013

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Abstract: Discovery learning model is one of the recommended models to be used for Curriculum 2013 implementation, yet many teachers have difficulty in using this model because of no experience and need the model. The purpose of this research is to develop Video for a teacher as a reference in implementing discovery learning models. This development research uses the FOUR-D model with stages Define, Design, Develop and Dissemination. This video uses the teacher as a model with real class situations. Learning is done by the teacher using the discovery learning model. The video shows the stages of discovery learning model that the teacher must do. The video was displayed to 28 mathematics teachers and they were asked to fill out a questionnaire to provide an assessment of the video in terms of format, content, and language. The results of the questionnaire analysis showed an average score of 3.64 for the format aspect, 3.67 for the content and 3.59 for the language aspect. The teachers mentioned that this video helps them to learn the implementation of discovery learning. This video can be used by any teacher especially mathematics teachers as the model in using discovery learning.

Keywords: Video of learning model, Discovery Learning

1. Introduction

The main factor that can influence the success of learning is the teacher's ability to use the proper instructional model in teaching. Teachers who have high ability in teaching will be creative and innovative to apply new things to learning. An assumption that improving the quality of learning can be achieved through increasing human resources including teachers and education staff, although other components also have contribution in improving the quality of learning [1].

Improving the quality of learning is closely related to the curriculum that applies in the learning process at school. The curriculum is a set of plans and arrangements regarding the purpose, content and learning materials and the methods used as guidelines for implementing learning activities to achieve certain educational goals. Along with the development technology and social need, the curriculum also has undergone changes. Since July 2013 the government has issued a 2013 curriculum that replaces the 2006 curriculum. In the early stages of the 2013 curriculum it was piloted at several government-appointed schools which began with 1st semester 2 and 4 elementary schools, 1st semester 7th grade junior high school and 1st semester grade 10 Senior High School [2].

\textit{MAN 2 Pekanbaru} has implemented the 2013 curriculum since the first year of issued. Based on observations of teachers teaching in \textit{MAN 2 Pekanbaru}, teachers still use conventional learning...
models. This can be seen from the learning model used by the teacher in the class. In government regulation Permendikbud No. 22 of 2016 it was stated that there are three main learning models that are expected to shape scientific behavior, social behavior and develop curiosity. The learning model are a problem based learning model, Project based learning model and Discovery Learning model [3]. Discovery Learning is a way to convey ideas or ideas through discovery [4]. In this learning model the teacher does not provide formulas or material directly but students are required to organize their own knowledge with the help of stimuli given by the teacher [5]. According to Emily discovery learning is an active learning model where students actively participate in the learning process. In this learning model students are required to think, ask, hypothesize, and cooperate with their friends to develop self-confidence in answering problems using their own thoughts [6]. Akinbobola & Afolabi mentioned that the use of discovery approaches can involve students in problem solving activities, independent learning, critical thinking, and creative understanding and learning [7].

Based on the results of interviews with three mathematics teachers of MAN 2 Pekanbaru, identified problems, namely the teacher has not been able to use the preferred learning model in the 2013 curriculum, even though the teacher has known the term learning model from the teacher training that he has attended. The inability of teachers to implement this learning model is due to the limited reference of teachers in implementing learning models in class, especially in discovery learning models. One of the references that can help teachers in implementing this learning model is learning videos, so that this problem can be overcome by developing a discovery learning video model.

Video is the technology of capture, recording, processing, storing, transferring, and reconstructing a sequence of still images by presenting scenes in motion electronically so that the video looks like a moving image [8]. Learning videos tend to be easier to use to improve memory and understand subject matter. This is in line with Silberman's opinion that audio-visual (video) learning can increase memory from 14% to 38% [9]. With the video learning model, the teacher can use the video as a reference for implementing learning in the classroom. Based on the above problems, researchers developed a video discovery learning model. This video learning model is expected to be a guideline for teachers in implementing discovery learning models and become a reference for teachers to carry out the learning process in the classroom.

2. Research Method
This research was conducted in class X MIA 5 MAN 2 Pekanbaru in the second semester of the academic year 2017. The method used in this research is development research. Development research is a research method used to produce certain products and test the effectiveness of these products [10]. This development research refers to the Four-D development model or 4-D model, namely the Define, Design, Develop and Disseminate stages [11]. Stages of research activities are described in the following fishbone diagram.
Figure 1. Fishbone diagram of the research stage

At the define stage, there are four activities carried out. In the front-end analysis sub-stage, the syllabus is analyzed to choose core competencies and basic competencies. The syllabus analyzed is the class X mathematics lesson on basic competencies 3.9 which explains the rules of sines and cosines and basic competencies 4.9 which is solving problems related to the rules of sines and cosines. In the sub-stage learner analysis conducted is to analyze the teacher who will use the product of this study. At the sub-stage of the concept analysis carried out is analyzing the concept of the learning material that is recorded, the order of presentation of material and technical programs in presenting material based on user characteristics information that has been found. The last define phase is Specifying Instruction Objectives produced through the video learning model developed.

The design phase is the stage of designing the product, at this stage the design of lesson plan, student worksheet and video learning scenario scripts is designed. The media format used is a learning model video. This learning model video product uses Adobe Premiere 1.5 for video processing and Adobe Flash Professional CS6 Application for supporting applications. In the initial draft stage a draft of lesson plan was produced, the worksheet, draft questionnaire and draft video learning script. This design becomes the initial design to start the develop phase.

At the development stage, the things done are developing, Lesson plan, student worksheet, questionnaire sheets and video scenario scripts of the learning model that has been designed. After completing the development, the contents of the script scenarios are validated by the validator. The results of this validation are revised and video learning models are taken with reference to the revised video scenario. Then the videos that have been obtained are adjusted to the scenario scripts that have been designed. If there is a discrepancy between the video and the scenario, then the inappropriate video sin is repeated. The stages of dissemination are carried out after the product has been revised. Dissemination is done to mathematics teachers.

3. Result and Discussion
At the define stage, information on the problems faced by teachers in the implementation of the 2013 curriculum was obtained. Information was obtained through interviews with several teachers. Based on the interview results, information was obtained that the teacher had difficulty in applying the learning model that had been recommended by the government in the implementation of the 2013
curriculum. The teacher's difficulties were due to the limited learning model video as a reference for the teacher to carry out learning. In the sub-analysis of concept analysis, the concept of learning material in the triangle area has been analyzed if the length of the three sides is known. The last define stage is by Specifying Instruction Objectives, which is to produce a discovery learning video model.

At the design stage, the draft Lesson plan has been produced, the student worksheet design, scenario video script design, and the design of video usage instruments. The lesson plan is designed for only one meeting which includes three activities, namely introduction, core activities and closing. The learning model used in Lesson plan is a discovery learning model. student worksheet is designed to refer to the Lesson plan and is guided by the material that has been determined. The video scenario script is designed to refer to the learning activities in the lesson plan. In this script several sin has been designed based on the stages in the discovery learning model. Video use instruments are designed based on aspects of format, content and language.

The development stage has been developed lesson plan, student worksheet, video script discovery learning models and video questionnaire sheets. The lesson plan was developed based on Permendikbud No. 22 of 2016. The lesson plan was developed only for one meeting, namely the material for the area of a triangle if the length of the three sides is known. The learning model used is the discovery learning model.

**RENCANA PELAKSANAAN PEMBELAJARAN**

Sekolah : MAN 2 Model Pekanbaru
Mata Pelajaran : Matematika-Wajib
Kelas / Semester : X / Gempa
Materi Pokok : Aturan Sinus dan Aturan Kosinus
Alokasi Waktu : 2 x 45 menit

**Figure 2.** Identity in Lesson plan

Student worksheet is developed in accordance with the lesson plan. On the student worksheet cover page contains the title of the material, student identity and instructions for using the student worksheet. student worksheet is developed in accordance with the steps in the discovery learning model which includes 5 stages, namely the stages of stimulation, problem identification, data collection, data processing and generalization.
In above student worksheet, the researcher design the activities that stimulate the students to think in their own related to the topic. Research give more attention in this stage of the learning design because stimulation is a critical part of implementing the Discovery learning model.

The video scenario script is prepared based on the lesson plan that has been prepared and discussed with the teacher that will teach in video. In accordance with the stages in the lesson plan, the video scenario script is divided into three main activities, namely the preliminary activities, core activities and closing activities. Conversations on videos are arranged according to learning needs that use discovery learning models with a scientific approach. In the preliminary activities the teacher must carry out three main activities, namely motivation, apperception and conveying the learning objectives. At the core activities all activities adjust to the phases that exist in the discovery learning model. In the closing activity the teacher conducts conclusions, reflections, evaluations and information activities for the next lesson.

Scripts are written and validated and scripts are given to the teacher and students who will carry out the activity. Teachers and students are given the opportunity to practice so that they are not too stiff when taking video. Video taking is done in the lesson according to the actual class setting. At the time of shooting, some students already understood and were able to carry out the roles they had to follow, however some parts of the video had to be repeated many times. Videos that have been taken and edited by the video maker are evaluated by the researcher to see their suitability with the stages of the discovery learning model. After being evaluated, there were several things that had to be taken to take pictures because there were two phases left behind, namely the phase of gathering information and the generalization phase of the concept. In addition, there are also disturbances such as aircraft noise and the sound of the school announcement speaker.
K. Script

1. Introduction activity (10 minutes)

a) The teacher enters the classroom while saying salam.
   
   **Teacher**: “Assalamu aliakum warahmatullahi wa barakatuh”
   
   Most students don’t simultaneously respond to greetings from the teacher.
   
   **Student**: “Waalaikumussalam warahmatullahi wa barakatuh”
   
   b) The class leader gives a command to greet the teacher and pray.
   
   **Class leader**: “Ista’id”
   
   **Student**: “Rabbis rabii shadii wa vassidi amrri, wahlah ‘udzazan mulissanii, yahegham gaulii. Radhim billahe rabbu wa bil islasam dina wa bi muhammadin nabiyya wa rasula. Rabbi zidni ‘ilmaa, warzaunii fahmaa”
   
   c) The teacher asks about the news and checks the presence
   
   **Teacher**: “How are you today?”
   
   **Student**: “Alhamdulillah, amazing. Allahu Akbar. Bangkit, bangkit, bangkit”
   
   **Teacher**: “Who is not present today?”

   (Tentative)

   d) The teacher motivates students by providing contextual examples relating to the concept of triangle area such as calculating the area of a triangle-shape garden.

**Figure 4.** Script of video

The next step is giving the text to the video. This text is used to emphasize the audience, in this case the teacher, about the stages of learning that they have to go through to do a learning according to the discovery learning model. The text used is a pointer to three main activities, namely introduction, core and closing. Besides that, emphasis is also placed on the phase of the discovery learning model and the scientific approach element. As for some learning video footage as shown in the following figure 5

**Figure 5.** Footage of the learning video

In the preliminary activities the teacher prepares students to learn, in the picture above it can be seen that students are praying before starting learning. At the core activity, the teacher gives student worksheet and in the closing activity the teacher invites students to conclude the learning outcomes and gives a quiz.
The next step is to develop a learning video questionnaire. This questionnaire was developed based on three aspects, namely aspects of format, content and language. After the video questionnaire was developed, Focus Group Discussion (FGD) was conducted. This FGD was conducted at PPG teachers to assess the results of the videos that had been developed. The FGD was attended by 28 junior high school teachers. Based on the results of the FGD, the results of the questionnaire data were obtained as shown in the following diagram

![Figure 6. Result of questionnaire diagram](image)

Based on Figure 6, it can be seen that the average assessment of FGD participants is more than 3.5 (1-4 scale). This means that the video learning model is good in viewed from aspects of format, content and language. According to some FGD participants, at the stage of collecting data and processing data it was not too detailed, this was because at that stage the learning model video was fragmented, so the process of collecting and processing data was not clearly seen by the students. At the teacher generalization stage does not provide reinforcement of the conclusions expressed by students. At this stage of generalization, the teacher should provide reinforcement or affirmation of the conclusions conveyed by students.

4. Conclusion
The development of this video discovery learning model has produced a 13-minute video. This video learning model has been completed with the text stages of the discovery learning model and also accompanied by text steps in the scientific approach. Based on the results of the questionnaire on 28 teachers, it was obtained an average of 3.64 in the format aspect, 3.67 on the content aspect and 3.59 on the language aspect. Based on the results of this questionnaire, it can be said that the development of the discovery learning model has been good so that it can be used as a teacher’s reference for implementing discovery learning models.

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