The Development of e-tutorial on Implementation National Curriculum 2013 for Mathematics Teacher

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Abstract. Curriculum 2013 is the new national Curriculum in Indonesia that is targeted to be used in all Indonesian schools in 2019. At this time the teacher training continues but the number and locations of teachers very diffuse and time constraints to be an obstacle for the government to be able to conduct training for teachers. This research resulted in the e-tutorial which is designed for mathematics teachers in studying the process of Curriculum implementation. This product will assist the government in accelerating the preparation of teachers in implementation of Curriculum 2013. This e-tutorial contains the dynamics of Curriculum development, learning model, learning assessment, lesson plan, curriculum stages of implementation and government regulation that is relevant to the implementation of Curriculum 2013. The product development started with a needs analysis through discussions with mathematics teachers about their difficulties in the implementation of the Curriculum 2013. This e-tutorial was developed using Application of Adobe Director 11. This paper discusses the results of need analysis, process development and results of product revisions made based on input from teachers during the FGD. From the discussion, it can be concluded that this e-tutorial easily understood by teachers and help them to understand the implementation of Curriculum 2013

Keywords: Curriculum 2013; e-tutorial; mathematics teacher

1. Introduction
The Curriculum is a set of plans and arrangements regarding the objectives, content and learning materials as well as the tools used to guide the implementation of learning activities to achieve specific educational objectives (UU no 20 tahun 2003). The Curriculum is designed in accordance with the times in which the Curriculum is used. In line with the shifting paradigms of learning government of Indonesia through Department of Education announced the change of National Curriculum in 2013. This new curriculum were built based-on understanding of the competence to be achieved in the learning process and realizing the importance of being trained for high-level thinking skills. The government published the new Curriculum named Curriculum 2013 that officially used on July 2013. In the beginning, the Curriculum only implemented at schools designated by the government which began with the first semester at grade 1 and grade 4 of elementary school, grade 7 junior of high school and grade 10 of senior high school. One of changes that occurred in Curriculum 2013 were the demands to the learning process that should lead to creativity. This demand is facilitated by scientific approach containing step of...
observing, questioning, experimenting, reasoning and networking. This is a student center approach that required both student and teacher to be creative in learning environment. These changes requires shift of the mindset both teachers and students in implementing the learning process. Teacher need to facilitate student facing through those five steps. Another significant change to the Curriculum 2013 is the assessment of learning outcomes. In the previous Curriculum put more emphasis on knowledge assessment, but the Curriculum 2013 make teachers must assess the improvement of knowledge, skills and attitude, as each of these components require different evaluation techniques. Many teacher faced difficulties to do those types of assessment.

In 2014 the government issued a policy that Curriculum 2013 applied across the school for grades 2,3,4 and 5th of Elementary Schools, 7th and 8th grade of junior high and and grades 10th and 11th of senior high school. Curriculum 2013 is applied in 6,221 schools since the year 2013/2014. In the year 2014/2015, this Curriculum is implemented in schools at 295 districts and cities across Indonesia. Applying new curriculum at the same time for all level schools definitely a big work to do for all people involve in education.

In order to prepare the implementation of the Curriculum 2013, the government has been planning and carrying out massive training of the teachers who will implement this Curriculum. Training strategy used is a leveling training. There are three levels of training for National Trainer, National Instructor and Teachers as the end-user. In the initial phase the government prepare and conduct a short training (3 days) for the National Trainer. National Trainer recruited from lecturer of Educational faculty, senior trainer from government office of Education, and selected teachers. National Trainers responsible to train the National Instructors that of representatives designated teacher from each district. Selected candidates for National Instructors are trained for 72 hours in the provincial level and then given the responsibility to train teachers who will implement Curriculum 2013 directly. End-user teachers given exercises for 52 hours in their respective districts. By taking training teachers are assumed ready to implement the Curriculum 2013 with all the demands of change from the previous Curriculum.

From researcher direct observations as the National Trainer, training that is provided for teachers limited to introduction level. Limited activities at training for teachers and time constraints did not make them ready for implementation. The training conducted so far only reached the stage of knowing yet not preparing teachers to implement curriculum. From the facts of various observation, the main problem in implementation the Curriculum 2013 are the lack of teacher capability. Teachers need more drill and practice on designing and implementing lesson plan. Another problem is the delays on supplying teacher books and the books for students. For that reason, at the beginning of 2015, the Ministry of Education and Culture decided to temporarily suspend the use of the Curriculum 2013 at some schools.

Government Regulation No 160, published December 11th, 2014 stated that the units of primary and secondary education that have implemented the Curriculum 2013 for three semesters can continue to use the them, the school that implemented curriculum 2013 just for one semester should re-implement the Curriculum 2006 until there is a provision of the Ministry to implement the Curriculum 2013 (Permendikbud 160, 2014). However, government also declared that if the school already implementing for three semesters, but was not ready they can request in writing for not using the Curriculum 2013. At this regulation also stated that schools could use the Curriculum 2006 up to 2019/2020. The Schools that have not implemented the Curriculum 2013 will be giving a training and assistance for school principals, teachers, an academic staff and educators supervisor.

Referring to the regulation above, the researchers saw the need to design a better and flexible way in preparing future teachers for implementation new curriculum for avoiding same failure. Preparation strategy for teachers should be able to accommodate the facts and circumstances that teachers’ ability in Indonesia is varied as teachers location spread from big cities to rural areas, including disadvantaged and outer regions. The existence of a teacher location also seriously affected the ability of teachers to obtain information. The teacher who was in town is closer to the sources of information are typically more agile of information and more adaptive to change. The use of technology as training media is one of the good choice at the moment.
According to Kopp (2012) The e-tutor plays a major role in supporting virtual collaborative learning, as he/she supervises learners in collaboratively solving tasks, acquiring new skills, and applying new knowledge. As mention by Feng (2016) Students very much appreciated e-learning that focused on the existing curriculum, but extended it so that they could do things in virtual reality that safety or cost factors prevent them from doing in real life at that stage in their studies.

Training is the giving of information and knowledge usually through speech, the written word or other methods of demonstration. In essence, through training, we are not looking to reshape the behaviour of an individual rather to teach the employee or learner how things are done so that they can then carry out a process on their own. This allows instructors/trainers to provide their learners with the tools to tackle current issues, develop life-long skills, improve on their problem-solving skills and utilize resources to the best of their ability (Epignosis, 2014).

According to researcher one of the alternatives that can be provided suitably in preparing teachers for implement the Curriculum 2013 is the e-tutorial material. As stated by Paay (2000) Online learning is defined as learning that takes place partially or entirely over the Internet. It was found that no difference in effects between the treatment and the control, between online learning and face-to-face learning. This e-tutorial material is used based on technology, currently technologies have been available widespread in Indonesia, so it is not expected to be a drag, but it is obvious that the availability of electricity is essential to be able to use this materials that are electronic-tutorial. Hay (2008) found that teaching material presented trough e-learning get more appreciation from students.

Material e-tutorial is designed to be used user-friendly, it can be used as a supplement for teachers who have had a training or use independently for teachers who have not had the opportunity to attend the training. By studying the e-tutorial teachers are expected to understand the concepts of the Curriculum 2013, the changed from the previous Curriculum, preparing lesson plans and learning assessment. The examples video of classroom activities that are designed based on the Curriculum 2013 and presented directly by the teacher with a real classroom setting. By watching this video teacher is expected can design their own class and practice to implement them. In this study, in accordance with the limitations of researchers academic background, product was developed only for mathematic subjects of middle and high school.

Another advantage of this tutorial material is training control in the hands of teachers as the user. Different from regular training, with this material teachers can use it in accordance with the availability of their time and situation. Teachers can also repeat the lesson in accordance with their needs and speed in understanding the material. Availability of e-tutorial will also help save transportation costs required from remote areas for attending many training.

There are several possibilities to use this e-tutorial for implementation Curriculum 2013. This e-tutorial can be used as a starting material, all mathematics’s teachers at junior high and senior high levels are given material to be studied. After using this material government can send instructors to the region to conduct short training and discuss the problems faced by teachers. This material can also be used by the trainer or instructor as a presentation to provide training to teachers and distributed it to the a teacher as guidance material when they face an obstacle in implementing Curriculum 2013.

2. Process of Development

The E-tutorial is developed through design research that done in several phases as follows:

a. Define Phase

At this stage of need analysis has been determined that the user of this program is mathematics teachers from junior and senior high schools who will implement the Curriculum 2013. Through Concept analysis has been selected the material to be presented, the order of presentation and presentation technique based on the information of the user characteristic. Task analysis is done to determine the forms of
activity given that the user can achieve the desired objectives through e-tutorial. Define phase ended by determining the specific purpose of training that will be generated through the e-tutorial.

b. Design Phase
Design stage is the stage of designing the product, the design is made for the contents and the flow of the program. Design activities are divided into several sub-activities, namely the selection of media, selection of media format, and a preliminary draft. Media format that will be used is a multimedia tutorial that will use text, audio and video. In accordance with the format to be used then it is determined that the media will be used is the application Adobe Director 11 for creating applications, Adobe Photoshop CS4 for image editing, Adobe Audition 1.5 for processing and sound editing, Adobe Premiere 1.5 for video processing and program Adobe Flash Professional CS6 for supporting applications. At the initial design stage we arranged sequence and story-board material from the program. This is the initial design phase to begin development.

c. Development Phase
The next stage is the stage of development, where materials and preliminary design of a product made, at this stage all of the program are assembled, all content that has been prepared in accordance with the program put together into the design of the story board. In the process carried out at least 2 times of focus group discussion (FGD) with prospective users for discussing parts of the product that has been made. The first FGD conducted for Curriculum Content and Mathematics subjects, second FGD done for Materials of Learning Design. At this stage program tray out also done to get input for improving the program.

d. Dissemination Phase
Stages of dissemination done after the product was revised based on the try-out results. Dissemination conducted on two different parts, namely the prospective user for introducing the product and to funders as a form of accountability. Dissemination done to the prospective user that facilitated by Department of Education Pekanbaru City as a research partner, to University or Riau and Department Higher Education as a funder.

3. Main Result
The development of research conducted to produce the user-friendly e-tutorial materials for Implementation of Curriculum 2013 for mathematics subjects. This product can be used by middle and high school mathematics’ teacher who uses the Curriculum 2013. Products produced in the form of teacher training material contained IT-based Curriculum 2013, steps on analysis core and basic competency, steps to prepare a lesson plan and develop the evaluation instruments that includes the attitudes, knowledge and skills. This material will gradually be equipped with video links that provide examples of learning uses a scientific approach in the model of Problem Based Learning, Discovery learning and Project Based Learning as suggested in the implementation of the Curriculum 2013. Video will be taken in the actual classroom setting once teachers have been trained to use the device that made by the research team. In the e-tutorial is also provided all the relevant government regulation relate to the implementation of the Curriculum 2013, and a summary of each regulation to help user in understanding the regulation easier.

This product will simplify and accelerate the Ministry of Education and Culture program in preparing teachers, especially mathematics teachers to implement the Curriculum 2013. This product is targeted to be use in two ways as trainer presentation on teacher training or can be
used as learning material for teachers independently and learn the relevant and quality examples. This effort will help government to achieve their target that all schools in the year 2019 is already using the Curriculum 2013. The products made have been validated and tested by the mathematics teacher for its practicalities.

The main result of this research is digital application in form of an e-tutorial for implementation, Curriculum 2013 on mathematics. Parts of the products discussed in this section. Some appearance on these products can be seen in the following figure:

![Figure 1. Product Cover and Menu](image)

The picture above show the main page of e-Tutorial that had two choices Materi and Video. The second figure showed main menu that has 7 parts namely Foreword, Dinamics of curriculum changes, Learning Model, Learning Assessment, Lesson Plan, Implementation Curriculum 2013 and Relevant government regulation. This attractive main cover expect to gain user interest for using the program. The user can choose any one of the main menu to begin they learning, but recommended to start from the first choice.

![Figure 2. Product Sub Menu Dynamic Change of Curriculum](image)

The Figure 2 give the sub-menu of Dinamics of Curriculum Change, it has five parts, they are the Background of changes, Mainframe of change, List of revision, and Implementation of change. This topics give the user the main idea or reason why they need the new curriculum. Understanding this background will help user to understand the change of curriculum. The 3rd menu Learning model has 5 parts names Scientific approach, Discovery Model, Problem Based Model, Project Based Model and Inquiry Model. Those are model and approach that recommended to be used in implementing curriculum 2013. User will also see the video of those relevant model for their reference in developing their own program.
Figure 3. Menu Learning Assessment
The 4th Menu Learning Assessment shown in the above figure. There are three sub-menu in this part, they are Models of Assessment, Analysis and Usage of Assessment’s data and Classroom Assessment Strategic. This Classroom Assessment Strategic presented in four parts as Assessment Guideline for Junior Highschool, Assessment guideline for Senior High School, Assessment Guideline for Teachers and Strategies in doing assessment.

Figure 4. Menu Lesson Instrument
At the Lesson Instrument Menu given 6 parts, they are Main Competency, Basic Competency, Students’ activities sheets, Learning Media, Lesson Plan, Syllabus and Standard for Learning Process. Sub-Menu of students’ activities sheets is divided into 4 parts, Activities sheets based on Discovery model for grade 7 Junior High schools, Activities sheets based on Problem model for grade 7 Junior High schools. The other two are activities sheets for grade 10 of Senior High Schools student using Discovery and problem-based model.

Figure 5. Menu Syllabus and Standard of Process
There are five part at Syllabus menu, Main Syllabus for Senior High School, Specific Syllabus for Senior High School, Syllabus for Junior High Schools, Syllabus for year 7 of Junior High and year
10 of Senior High Schools. The Standard of Learning Proses giving a guideline for both learning process at Junior High School and Senior High Schools teachers.

On the menu of Curriculum Implementation are given 3 submenus, textbooks, teaching material for curriculum implementation training as well as activity sheets for teacher in curriculum implementation training. On the sub-menu of textbook is provided the books for teacher and student at both level Junior and Senior High Schools. These books are standard textbook provided by government. The teacher and student can find supplement book at their own.

Figure 6. Menu Learning Assessment

Figure 7. Menu Curriculum Implementation

Figure 7 show the menu for Curriculum Implementation, there are 6 different Activities sheet for teacher training. Those activities sheets will be used for drill and practice of Lesson Plan, Analysis of learning assessment, Analysis of Learning Outcome, Main Competency, Basic Competency, analysis of learning design, students and teacher textbooks. These activities are design by government for all training provided for teacher in preparing them to implement curriculum 2013.

Figure 8. Menu Curriculum Implementation Process

On the above figure presented the menu on Curriculum Implementation process. The material is divided into two sub-menu, each for Junior and Senior High School. This content taken from the
program teacher training that design by government in preparing teacher to use the Curriculum 2013.

![Figure 9. Menu Relevant Government Regulation](image)

On this menu presented several government regulation that is relevant or use as basis on implementation of Curriculum 2013. Those regulation related to Learning Outcome, Standard of Learning Process, Standard for Learning Assessment. Each of them available for both Junior and Senior High School.

![Figure 10. Menu program guideline and exit page](image)

Figure 10 show the pages of program guideline and the exit page. The guideline page give the user the way to use the program as the whole. In this submenu been explained all the buttons being used. User get the reminder if they really want to close the program when the end of program reached.

4. Conclusion

From the development, the researcher tried to present the conclusions of the process and product research:

a. The product development process is determined by the availability of data and materials from the training that has been developed by the government. Therefore, change of the Curriculum of training materials at the last minute of research activity has affected the products development.

b. The e-tutorial product is an alternative and supplement material that will be used by teachers in preparing for the implementation of the Curriculum 2013, the materials used in this product at least equal to the material provided by the government training program.

c. In this product also added some material designed and developed by researchers as a support for teachers in understanding the various model of learning design.
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