

## Development of Scientific Learning E-Book Using 3D Pageflip Professional Program

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### Abstract

Curriculum 2013 prioritizes scientific-based learning. The scientific approach to familiarize students think high order thinking patterns. Based on preliminary analysis known that teachers have difficulties in designing a lesson plan scientifically based and requires a reading source procurement efforts. The development of technology can be used to develop educational products, such as e-books using the *3D Pageflip Professional* program. Based on the literature study, this program has the advantage of digital interactive book design, flexible, efficient and effective as it integrates text, images, audio, and video. The study was conducted with the aim to provide problem-solving efforts related to adherence to the curriculum in 2013 through the development of scientific learning e-book. Researchers used the ADDIE model of research and development with the flow: analysis, design, development, implementation, and evaluation. The results of research in the form of an e-book product of scientific study that has been declared feasible by a team of experts (97.33% of material and media expert 98.7%), practitioners (supervisory 97.33%), and 90.6% with teachers' perceptions category very good. Practically, this research can be useful for teachers, governments, and researchers for services procurement expertise in the form of innovation in educational products.

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## INTRODUCTION

The development of technology has brought a great influence in the field of education. The influence of these developments is evident in efforts to reform the education system and learning (Kuswanto & Walusfa, 2017). According to Rahmani, et al. (2017), current advances in technology can be utilized to improve the quality of education. Implementation of education or curriculum implementation requires the support infrastructure especially learning resources as well as an adequate cost (Sukmadinata, 2010).

Source learning or teaching materials is a set of systematically arranged material to create an atmosphere that allows readers to learn. According to Lestri (2013), suggests that efforts to improve the competency to do with teaching materials tailored to the requirements applicable curriculum. Teaching materials as a tool in education can generate new desires and interests, as well as the motivation and stimulation of psychological influences in learning (Hamalik, 2010).

*The e-book* is an innovation of teaching materials in the form of non-print with a shape resembling a printed book but was able to overcome the limitations of the printed book because it produces products in the form of soft files so efficient and economical distribution. While the quality test, demonstrate products developed attractive, flexible, and useful (Hidayat, et al. 2017) disclosed the effectiveness of the product produced has the effect of being in the study of students The results Mawarni and Muhtadi (2017) revealed that the advantage of the *3D Pageflip Professional* program is: the video is displayed in the form of three-dimensional (3D).

The role of teachers as professionals emphasis on mastering science or management capabilities along with implementation strategies (Ahmadi, 2010). According to Haryono, et al. (2017), teachers remain the beacon of hope by many parties in an effort to improve the quality of education.

Permendiknas number 41 in 2007 on the Standard Process, set about planning the learning

process that requires the educator in the educational unit to develop a lesson plan (Efendi & Susilowibowo, 2014). Lesson plan was conceived and developed by teachers is a strategy in managing the learning process. Lesson plan quality greatly affects the success of the curriculum in 2013 that have the characteristics of scientific-based learning.

According to Hosnan (2016), the scientific approach is believed to be the golden bridge and the development of attitudes, skills, and knowledge of students through scientific measures, namely: observe, ask, gather information, associate or analyze, and communicate. The application of the scientific approach as a fundamental approach to the curriculum in 2013, stated in Permendikbud No. 65 of 2013 on Standards Process.

Referring to the findings of the literature on adherence to the curriculum in 2013, it is known that teachers face several obstacles, including (1) training or socialization related to the implementation of the curriculum in 2013 is still not evenly distributed; (2) teachers find it difficult to design and develop a lesson plan (lesson plan) according to the curriculum in 2013 which uses a scientific approach; (3) Lack of resources or associated learning resource teacher understanding in designing lesson plan (Ningrum & Sobri, 2015; Retnawati, 2015; Pranawati & Tuasikal, 2014; Kustijono & Wiwin, 2014).

The teacher has a group of Congress Subject Teacher (MGMP) as a forum to meet, discuss and implement a program of activities which refers to efforts to increase the competence and professionalism of teachers. The results of field analysis known that through MGMP, we can know the constraints faced by teachers in implementing the tasks profession. Permasalahn their socialization uneven curriculum in 2013, resulting in gaps in understanding or competence of teachers. Leveler range limitations of government in the socialization of the teacher become the biggest obstacle in the successful implementation of the curriculum in 2013.

Although the implementation of the curriculum since the beginning of 2013, the

government has provided a source of reading an e-book for teachers or teacher known book, 2013. Book curricula of teachers curriculum 2013 issued by the government in \*pdf format, so it has its limitations in terms of the content used for only the image and text. Limitations of the underlying charge are exactly what the content of the e-book provided by the government only focuses on applied learning is ready to use as a standard reference minimal learning device for the implementation of the curriculum in 2013, so it still needs to be developed.

Has a lot of development of e-book using a *3D Professional Pageflip* program viable used as a learning resource. However, there has been no development of e-book that includes material scientific study and is intended as a learning resource for teachers.

Based on the problems and needs of teachers to the source of reading material that includes socialization curriculum in 2013, especially scientific learning, it is important to carry out development refers to efforts to facilitate teachers in developing an understanding or competence related scientific learning curriculum 2013.

The purpose of this research is to develop an e-book product of scientific learning using *3D Pageflip Professional* programs are to be stated feasible by a team of experts and practitioners as interactive learning resources, which provide sufficient understanding for teachers.

## METHODS

Research e-book scientific learning in the Research and Development (R & D) model of ADDIE grooves: (1) analysis of the performance, needs and characteristics as a preliminary study; (2) design of products made reference to the results of a preliminary study analysis, the design steps, including: preparation of the outline of the content of the media, the basic pattern of media activities, the draft media, and the storyboard (Asyhar, 2012); (3) development which includes: media production, media validation by a team of experts (media and materials) and the revision of the product to be eligible; (4) implementation of

the product was conducted to determine the feasibility of the quality of products based on objective response (users). Implementation is done in the small group trial (10 teachers) and tests a large group (30 teachers) with the same characteristics,

The research activities carried out from April to May 2018. The implementation of product testing conducted on a small group and large group trial.

## RESULTS AND DISCUSSION

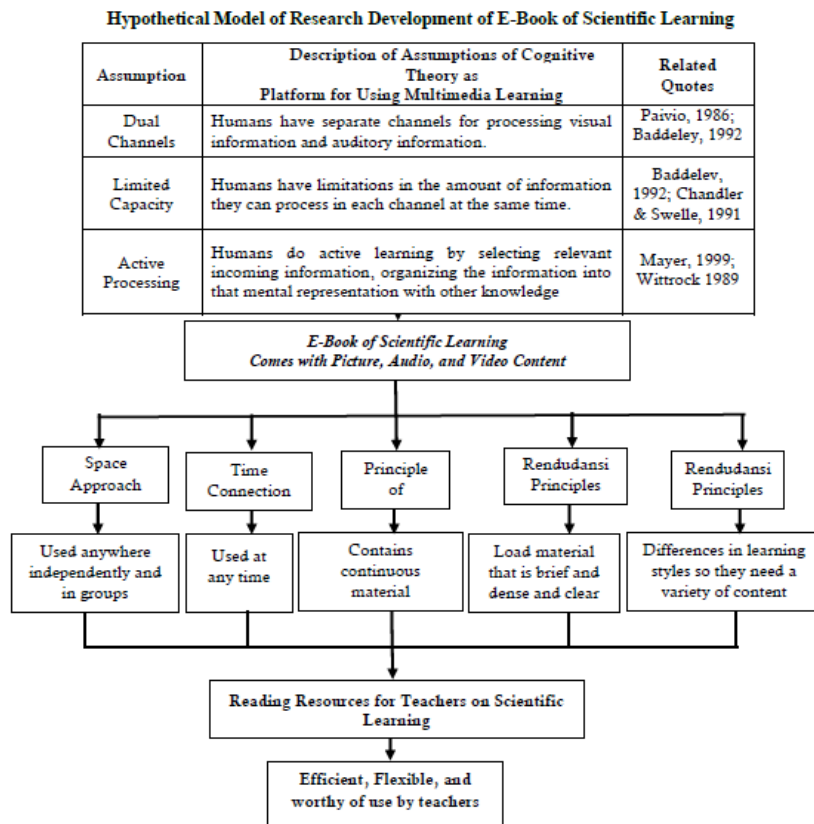
Research development of scientific learning e-book refers to the attempt to produce with measures of research using ADDIE models. The hypothetical model development research done can be seen in Figure 1.

Research development of scientific learning e-book based on three assumptions cognitive theory which is then formulated in a hypothetical model of the study (Figure 1). Of a hypothetical model in developing a research note that the e-book product of scientific study, researchers need to consider the principles of multimedia so that the product appropriate.

The questionnaire contains the analysis of teacher performance issues, the needs of teachers and teacher characteristics and reading sources. The results of performance analysis showed that 100% of the teachers had imposed curriculum of 2013, but there are still 27.3% of teachers who have not completed the curriculum of socialization, 2013, and 100% of teachers said that socialization is not enough given them an adequate understanding.

This resulted in as many as 93.9% of teachers feel difficulty in designing the lesson plan scientific learning. The results of the needs analysis revealed that 100% of teachers in need of reading materials in an effort to increase the competence of teachers to design lesson plans based on the scientific approach. Source readings mean that the digital book or e-book (100%) that contain text, pictures, and video. As for the charge content materials needed understanding teacher, include: (1) the introduction of curriculum 2013 (72.7%); (2) criteria for

scientific-based science learning (100%); (3) the four main models of learning curriculum in 2013 (100%), and (4) guide the preparation of lesson plan based scientific approach (100%).



**Figure 1.** Model hypothetical Development Research Scientific Learning E-Book

The results of the characteristic analysis showed that all teachers have had the support facilities adequate ICT in schools (100%) and personal support facilities such as computers (45.5%), laptops (100%), and Android (100%). Teachers tend to understand or learn something in the style of learning to read (90.9%), observed (100%) and hearing (93.9%). The product design scientific learning e-books produced by several steps: (1) formulation of the product of interest generated based on data analysis; (2) outline of the media content topical material products; (3) The basic pattern learning activities include the proposed pattern required to give the impulse users to learn by providing media contents required ie, image, audio, and video; (4) draft scientific learning e-book containing picture sort order for the charge material products; and (5) iStory board e-book of scientific learning is

used as a guide to see the design in the production process.

**Generated Product Display**

E-book product development (figure 2) is based on a scientific study design produced in the previous stage. The e-book that has generated needs to be validated by a team of experts and practitioners to find out the quality of its feasibility before it is implemented. Results matter expert validation phase 1: 82.67% by eligibility category good but needs to be revised, so that obtained results of the validation phase 2: 97.33% with a very good category without revision, and media expert validation results of phase 1: 84% by eligibility category good but there are revisions in some aspects, in order to obtain the results of media validation phase 2: 98.7% with very good categories, as well as school superintendent response results as the

practitioner obtained a score of 97.33% with an excellent feasibility category.



Figure 2. Product Scientific Learning E-Book

Implementation of the product is done by testing a small group and large group trial. The results of the implementation of the small group trial which was held on May 5, 2018, obtained an average percentage of 76.1% response of teachers with good feasibility category, but there are suggestions and comments regarding the product.

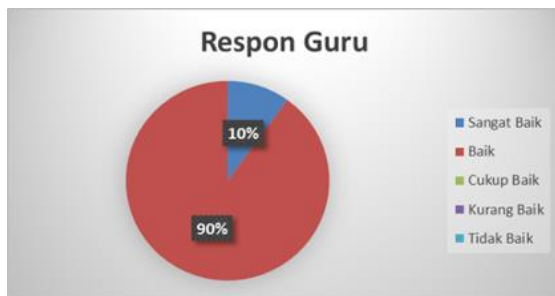


Figure 3. Test Results Small Group

Diagram of the test results of small groups (Figure 3) describes the response of teachers' acquisition score of 90% for both categories of eligibility and 10% for feasibility excellent category. Once the product is revised, the next product is implemented back in the large group trying held on May 19, 2018, through the activities of scientific learning workshop with researchers act as a resource. In this activity, participants using e-book product as training material and guidance in understanding the scientific learning. The result of a large group earned an average score of 90.6% response of teachers with an excellent feasibility category.

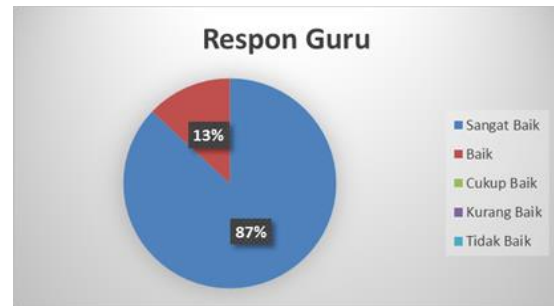


Figure 4. Diagram Large Group Trial Results

Diagram of a large group of test results (Figure 4) provides teacher response acquisition scores of 13% for both categories of eligibility and 87% for feasibility excellent category.

Evaluation of scientific learning products has basically been done on any development process or formative evaluation. The results of this evaluation refer to the quality of the feasibility of the product with the end result is very good to gain eligibility category based on results of the validation team of experts, practitioners and teacher response. In another study of similar also shows that research model development ADDIE with the flow analysis, design, development, implementation and evaluation, is a model that is suitable for use in the research development of teaching materials for structured sequences of activities that systematically to solving related with learning resources according to the needs and characteristics of learners (Tegeh & Kirna, 2013; Sukariasa, et al. 2014; Firdaus & Muchlas, 2015).

ADDIE is one model that is systematic. Romiszowski (1996) suggested that the rate of learning materials design and development, systematic model of ADDIE as procedural aspects of the systems approach has been implemented in many practices methodology for the design and development of the text, audiovisual materials, and computer-based learning resources. The e-book is a computer-based learning resource, which can provide interactive and dynamic appearance. Availability of content displayed three-dimensional (3D), can be used for distance learning, can be directly used without having to have the app if publish in form of \*HTML or in the form of digital books \*3dp (Sari, et al. 2017).

Feasibility aspects in product development results using ADDIE models required according to the Sugiyono Riechey (2015), that advisability testing was conducted to determine the quality and usefulness of products. There are several ways of testing the validity or advisability a product, namely through internal and external testing. Internal testing conducted by experts, while the external testing performed by practitioners. From the results of the feasibility test these products, known causes products to be eligible, such as: an interactive view of the teaching materials e-book that presents the material and its implications in our daily lives in the form of video that can be observed users as the information in understanding (Munawwarah, et al. 2017; Puspitasari & Rakhmawati, 2013; Munwarah & Buditjahtanto, 2016; Humairoh & Wasis, 2015; Rodríguez, et al. 2018; Vassiliou & Rowley, 2008; Mark, et al. 2016).

ADDIE model selection as a development of e-book model of scientific learning based on the consideration that this model developed systematically and rests on a theoretical basis of design development and learning. Sequence of research steps development using models ADDIE more structured and are suitable to carry out research and development, especially the development of learning resources proven by the results of e-book learning scientific use *3D Pageflip Professional* program is generated through the process of research model development ADDIE

quality feasibility as a learning resource for teachers with excellent category based on an assessment by a team of experts (subject matter experts and media expert), practitioners and users (teachers).

## CONCLUSION

This results in a product development research eBook scientific study that has been declared feasible by a team of experts and practitioners as well as the teacher's response. E-book destined scientific learning for teachers and prospective teachers who want to understand the scientific learning materials, models, and the preparation of its lesson plan. E-book of this scientific study is an electronic book that is developed in the form of multimedia using the 3D Pageflip Professional program, contain materials that are adopted from the training curriculum materials in 2013 and e-book teachers curriculum 2013 issued by Kemendikbud. Products e-book very worthy of scientific study as background reading for teachers in particular fields of study the feasibility of IPA with the very good category.

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