Analysis of learning media based electronic for developing of physics e-book with earthquake theme

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Abstract. Education always tries to take advantage of technology in the learning process according to the needs of students and teachers. Teachers and students need learning media based electronic to minimize the limitations of space and time, and prepare students mentally in the face of natural disasters. This study aims to analyze learning media based electronic as a preliminary study for the developing of physics e-books with earthquake theme used in physics learning. This research uses a quantitative descriptive methods with the population being all students of class X at SMAN 2 Ranah Pesisir and the sample selected using a purposive sampling technique. The instrument used was a questionnaire about learning media the distributed to students that included thirty five statement. The results showed that the quality of technical, content and purpose were in good category with values of 73.09%, the quality of learning were in good category with values of 74.30% and learning media based electronic were in simply category with values of 68.97%. These results indicate that the learning media based electronic need to be further improved. So, further research needs is the developing of physics e-book with earthquake theme for students.

1. Introduction
Education always tries to take advantage of technology in the learning process according to the needs of students and teachers. Technological developments are marked by the emergence of various technology-based activities so that teachers and students can access information anytime and anywhere [1]. This provides a big change for copying the real world into the virtual world. In addition, teachers are required to convey material appropriately so that learning purpose is maximally achieved. Therefore, needed is an effective and efficient learning media so that the material provided is easily accepted and understood by students [2].

Learning media can be interpreted as an intermediary or a bridge between teachers and students. Learning media are used to convey messages from teachers to students so that they can stimulate thoughts, feelings, and attention students in order to achieve learning purpose [3]. Learning media can also represent information that is not able to be pronounced through certain words or sentences, even the abstractness of the material can be concrete in the presence of the media. Students it will be easier to understand the material with learning media. In addition, learning media can increase student motivation to learn, vague learning materials will be easily understood and mastered by students well,
varied learning methods so that students do not feel bored to learn [4]. So, learning media has many benefits in learning processes.

Learning media consists of print and electronic media. Print media is prepared in paper form to convey learning purpose such as books, modules, brochures, student worksheets, and others. Print media will be easily damaged, torn and the use of print media is boring and makes students rarely study it because of its unattractive appearance. Meanwhile, electronic media is media that uses technology to access information virtually [5]. The complexity of the learning material that the teacher will convey to students can be simplified with the help of the learning media based electronic.

The fact that occur in schools in the teacher learning process have not fully utilized learning media based electronic. The teaching materials used are still in print and have not been integrated with the disasters. In addition, learning media are often neglected for various reasons including: limited space and time, difficulty finding the right media, and unavailability of funds to make learning media. This causes the achievement of student competencies to be less than optimal. To overcome this, many learning media based electronic are needed developing.

Learning media based electronic is very practical compared to print media. Students can view and access learning materials using android and computers. Currently, electronic media is very much developed as the main medium to achieve learning purpose and improve the quality of learning experienced by students [6]. One of the subjects suitable for using learning media based electronic is physics learning. Physics is a branch of natural science that studies natural phenomena [7]. Physics is born from phenomena that occur in nature through experimental activities in order to obtain formulas to prove this truth. This requires a large amount of time and space. Electronic media can overcome these limitations of space and time by presenting videos, images and animations of natural phenomena via a computer or android. In addition, electronic media is a way to save paper usage. Therefore, teachers take advantage of technology to develop electronic books, better known as e-books.

Research about the analysis of learning media based electronic is the most important part in the development of physics e-books because electronic media can minimize the limitations of space and time. E-books are presented in an electronic format that is able to display interactive simulations by combining animation, text, video, images, audio, and navigation which makes students more interactive so that learning can take place more fun and attract students' attention [8]. E-books are used as interactive learning resources, have a small physical size, easy to carry, not weathered, easy to process, easy to duplicate, easy to distribute, support greening, reduce paper waste and reduce tree cutting [9]. E-books also make it easier for students to find information and environmentally friendly. E-books are electronic books that contain information in digital form and have many benefits. Through e-books, learning materials can be accessed from anywhere and anytime by students with integrating materials [10]. To make physics e-books more effective and efficient, e-books can be designed by integrating earthquake disasters.

Earthquake is a natural event that cannot be predicted when and where it occurred [11]. Indonesia has experienced since 1900 three major earthquake events, namely earthquakes Banda in 1983 with an intensity of 8.5 on the Richter scale. Sumatra earthquake in 2004 with an intensity of 9.0 the Richter scale and earthquakes Nias in 2005 with an intensity of 8.7 on the Richter scale. Pesisir Selatan is one of the districts in West Sumatra which is prone to earthquakes. Earthquake is a type of disaster that is destructive and can occur at any time and last a short time. Earthquakes can destroy buildings, roads, bridges, and so on in an instant [12]. Even though earthquakes are prone to occur in the circle of fire, where and when they occur cannot be determined with certainty. Therefore, school institutions are needed to reduce the effects of earthquakes through learning media based electronic.

The teacher can pour physics learning material in the form of a physics e-book that is integrated with earthquake material. Physics e-book with earthquake theme can prepare students mentally in facing earthquake disasters that often occur in Indonesia so that students are not anxious and can take the right steps before, during and after an earthquake [13]. The media needs analysis aims to describe the basic problems regarding the need for media development in the form of e-books in learning
physics. This study aims to analyze learning media based electronic as a preliminary study for the developing of physics e-books with earthquake theme used in physics learning.

2. Research Method
This research uses a quantitative descriptive methods. Descriptive method is designed to obtain information about the status of a symptom when the research is conducted [14]. Based on the analysis of regional potential, the determined population is all students of class X at SMAN 2 Ranah Pesisir which consisted of four classes. The class used as a sample is class X MIPA 2 with 24 students. Samples were taken using purposive sampling technique. This research procedure consists of three stages, namely: collecting, analyzing and interpreting data.

The instrument used was a questionnaire about learning media the distributed to students. The questionnaire contains 35 statements in the form of positive sentences. This questionnaire consists of three components, namely: technical quality, content and learning purpose consisting of three indicators, learning quality consisting of three indicators and learning media based electronic consisting of four indicators. The research questionnaire used is closed, meaning that the answer has been provided and students cannot give answers freely. Each statement will be responded to through the answer column with a liker scale covering 4 alternative answers. Score 4 if "very agree", score 3 if "agree", score 2 if "disagree" and score 1 if "not agree" on each statement [15]. After the qualitative responses of respondents were converted into ordinal scale form, the scores were added upper each indicator and then expressed in percentage form with the following calculations.

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Value = \frac{\text{total score}}{\text{highest score}} \times 100\%
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After obtaining the percentage value from data processing, an analysis is carried out using categories such as table 1 below.

| No | Category   | Value (%) |
|----|------------|-----------|
| 1  | Less       | <60       |
| 2  | Simple     | 60-69     |
| 3  | Good       | 70-79     |
| 4  | Very good  | 80-100    |

3. Result and Discussion
The result obtained were based on a questionnaire consisted of three components, namely: technical quality, content and learning purpose, learning quality, and learning media based electronic which could be used as a reference in developing of physics e-books with earthquake theme. The results of the analysis quality of technical, content and purpose learning can be shown such as figure 1 below.
Figure 1. Quality analysis of technical, content and learning purpose

Based on Figure 1, it can be explained that the value on each indicator ranges from 68.75% to 78.64%. Analysis quality of technical, content and purpose for class X MIPA 2 at SMAN 2 Ranah Pesisir divided into four category namely very good category with ranges 80-100%, good category with ranges 70-79%, simple category with ranges 60-69%, and less category with ranges 0-60%. Quality of technical, content and learning purpose consisting of three indicators. The first indicator has a value 71.87% (good category). The second indicator is 78.64% (good category). The third indicator is 68.75% (simple category). Of the three indicators, the lowest scores is the third indicator with values of 68.75%. The average score for quality of technical, content and purpose learning is 73.09% (good category).

Based on the analysis quality of technical, content and learning purpose that the all indicators need to be improved. The first indicator about the learning media relevant to the learning purpose. The second indicator about the learning media relevant to the learning material. The third about the learning media is authentic, simple, clear and easy to understand (quality of technical). The third indicator is quite a concern to be improved again. In the third indicator, there is a statement regarding learning media in the form of pictures, photos, graphs and diagrams that are clear, easy to understand and describe the actual situation getting the lowest score. This means that the use of learning media at SMAN 2 Ranah Pesisir is still minimal. To overcome this, necessary to learning media that discusses about content of physics material with clear, dense and concise so it is easily implemented by students and student competence increases. Therefore, teachers take to development of a physics e-book. Next, the result obtained from analysis quality of physics learning can be shown such as Figure 2 below.
Figure 2 shows that results analysis of the quality of physics learning ranges from 67.71% to 79.16%. Analysis of the quality of learning physics for class X MIPA 2 at SMAN 2 Ranah Pesisir divided into four category namely very good category with ranges 80-100%, good category with ranges 70-79%, simple category with ranges 60-69%, and less category with ranges 0-60%. The quality of learning physics consists of three indicators. The first indicator, the advantage of learning media with a value of 79.16% (good category). The second indicator, learning media attracts students' attention to learn with a value of 67.71% (simple category). In the second indicator, there are statements about pictures, photos, graphs and diagrams in learning media that attract students' attention to learn physics to get the lowest score. Most students think that physics material is difficult material. The third indicator, the function of learning media with a value of 76.04% (good category). Of the three indicators, two indicators are in good category (first indicator and third indicator) and one indicator is in the simple category (second indicator). Of the three indicators, the lowest scores is the second indicator with values of 67.71%. The average score for quality of physics learning is 74.3%

The results of the analysis show that all indicators on the components of the quality of physics learning need to be improved. The second indicator is a concern to be improved again. In the second indicator, there are statements about pictures, photos, graphs and diagrams in learning media that attract students' attention to learn physics to get the lowest score. Most students think that physics material is difficult material. Students consider physics material to be something they haunt because they have many formulas and are abstract. This assumption should be eliminated by making learning media that is attractive and interactive so that it can foster student attention to learning physics. Interactive learning media makes students active students so that the learning process is centered on students and the teacher is only a facilitator. The teacher provides opportunities for students to accommodate students' creative ideas. If students find it difficult to understand physics learning material, the teacher will provide solutions or justify the physics concept so that the quality of physics learning increases. This will add to the experience and insight of students to know more about physics material. Should the media used in learning physics adds to the experience and insight of students in learning and the media used in learning helps students understand physics material. Next, the result obtained from analysis of learning media based electronic can be shown such as Figure 3 below.
Based on Figure 3, it can be explained that the value on each indicator ranges from 55.20% to 82.08%. Analysis of learning media based electronic for class X MIPA 2 at SMAN 2 Ranah Pesisir divided into four category namely very good category with ranges 80-100%, good category with ranges 70-79%, simple category with ranges 60-69%, and less category with ranges 0-60%. The analysis of learning media based electronic consists of fourth indicators. The first indicator, the supporting device with a value of 82.08% (very good criteria). The supporting devices studied consist of hardware (computers, laptops and LCD projectors) and software (google classroom and edmodo). The hardware used in schools scores higher than the use of software. The second indicator, the benefits of electronic media with a value of 73.75% (good category). The third indicator is the type of electronic media commonly used in schools with a value of 64.84% (simple category). The fourth indicator is electronic media content with a value of 55.20% (less category). Of the fourth indicators, the lowest scores is the fourth indicator with values of 55.20%. The average score for learning media based electronic is 68.97%.

The types of electronic media studied were audio, audio visual, learning animation, e-learning (online learning), phet simulation (virtual laboratory), e-books (digital books) [5]. This questionnaire was given to students of SMAN 2 Ranah Pesisir because this area is one of the areas prone to earthquakes. Analysis of learning media based electronic in the form of an e-book has not been applied in SMAN 2 Ranah Pesisir so that is strongly supports the development of physics e-books with earthquake theme. This means that students do not have sufficient quality learning media, especially electronic media. Therefore, students need to given an e-book in learning physics

Based on the analysis questionnaire, information was obtained that the technical quality, content and learning purpose, learning quality, and learning media based electronic especially in SMAN 2 Ranah Pesisir are still not optimal and need to be improved in all indicators. It is better if schools have adequate learning media to deal with today's technological sophistication. Space and time are no longer a barrier for students to learn physics so that students can access information anywhere and anytime. The questionnaire analysis also showed that students preferred and liked electronic physics learning more than printed media. Therefore, students need to given an e-book in learning physics

Physics materials can be translated into instructional materials in the form of e-book. E-books are learning media based electronic that utilize digital technology. E-books have become popular learning media for several years because the government fully supports the use of e-books in learning physics. E-books are a form of teaching material that is appropriate for use in a pandemic like today, where face-to-face learning cannot be done as usual. The ease of delivery of the material contained in this
ebook is one of the many advantages of the ebook compared to printed teaching materials. E-books help teachers streamline and streamline learning time. Teachers are very bothered if they have to carry a lot of reading books in their physical form.

The e-book developed not only contains high school physics material, but is integrated with local wisdom or regional potential, including potential disaster-prone areas. Physics e-book with earthquake theme can prepare students mentally in facing earthquake disasters that often occur in Indonesia so that students are not anxious and can take the right steps before, during and after an earthquake. SMAN 2 Ranah Pesisir is located in the Pesisir Selatan area. Considering that the Pesisir Selatan area is prone to earthquakes, it is necessary to integrate earthquake disasters in physics learning. The results analysis of the learning media based electronic very useful in the development of the ebook because the information provided is used to modify the teaching materials that are currently in use, and how to improve the quality of the teaching materials to be better and more effectively.

4. Conclusions
The conclusion in this research is that learning media based electronic in physics learning at SMAN 2 Ranah Pesisir are still not optimal and need to be improved. Based on the results of the questionnaire analysis, can be seen that the quality of technical, content and purpose were in good category with values of 73.09%, the quality of learning were in good category with values of 74.30%, and learning media based electronic were in simply category with values of 68.97%. Learning media based electronic were in lowest percentage value, so necessary to developing physics e-book with earthquake theme for high school students. By taking the results of the learning media based electronic, it is hoped that the physics e-book with earthquake theme that will be developed become a valid, practical, and effective product.

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