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Development of Android-based Interactive Learning Media in Science Learning on Space Exploration Material

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Abstract

This study aims to develop The purpose of this study is to develop interactive learning media based on android in science learning on space exploration material. This study uses the Research and Development method with the ADDIE method which includes the stages of Analysis, Design, Development, Implementation, and Evaluation. The subject of this study is the feasibility of interactive learning media and the object of this study is students. The feasibility test was carried out by means of individual tests (One to One) on 3 experts, namely material experts, learning experts, and media experts, as well as 3 students. In addition, small group tests were also conducted on 9 students selected based on good, moderate, and poor abilities in science subjects. The data collection technique was carried out using a questionnaire using a Likert scale. Data analysis was carried out using quantitative descriptive. The results of the study showed that: interactive learning media is able to facilitate science learning with the results of the assessment of material experts worth 90.91%, learning experts worth 92.50%, media experts worth 78.75%, 3 students got a score of 86.81%, and Small groups worth 87.38%, and this interactive learning media is feasible to use based on the results of media trials by experts and students.

Keywords: Development, Interactive Learning Media, Media Feasibility, Natural Sciences

Introduction

Education is a very important issue in life. Not only is it very important, even the issue of education cannot be separated from life at all [1]. Education is a media that has an influence in determining the direction of a country's success. Education is a pillar in efforts to develop human resources [2]. Quality education is needed in the process of maturing the quality of students which is developed by freeing students from ignorance, inability, helplessness,

untruth, dishonesty, and from bad morals and faith [3]

The rapid development of this technology is certainly a challenge for teachers to be able to play a role and facilitate students in building knowledge in the global era. The use of technology is unavoidable because it is the era, a teacher is required to be able to follow these changes and developments with the aim of preparing students to face change [4].

One of the consequences of the rapid development of science and

technology requires the formation of quality human resources, namely human resources who have mastery of scientific competence in knowledge and technology and are able to keep up and utilize it well. To face the era of globalization, mastery of technology is very important for students to have so that they are able to face globalization and be left behind [5].

Technology in the world of education has been applied massively such as in the use of learning media. Learning media can function as learning materials or sources for students as well as tools for teachers in the classroom. This is in line with Asyhar who stated that learning media not only functions as a tool used by teachers in learning, but can also function as a learning resource for students [6].

Learning media is divided into several types, namely sound media, variation media and visual media. Media presented in audio form and can only be appreciated by hearing is known as sound media. Audiovisual media is media that can not only be enjoyed with the sense of sight but can also be enjoyed with the sense of hearing simultaneously. While visual media is media that can only be enjoyed with observation or the sense of sight [7].

Media is one of the educational subsystems, media is one part that supports the achievement of predetermined learning objectives. The use of media can make it easier for an educator to convey the material to be delivered to students. In this case, it can be said that one of the main functions of learning media is as a teaching aid that influences motivation, conditions, and the learning environment.

Learning media is one of the components that must be included in the Learning Implementation Plan (RPP) which is prepared based on Basic

Competencies (KD) or sub-themes that are carried out at meetings or more, in accordance with the Regulation of the Minister of National Education and Culture number 22 of 2016.

Educational media as a learning resource helps teachers enrich students' insights. Various forms and types of educational media used by teachers are sources of knowledge for students. Media as a learning resource is known as audio, visual and audiovisual aids. The use of these three types of learning resources must be adjusted to the formulation of learning objectives and of course to the competence of the teacher himself and so on. So teachers who are good at using media are teachers who can manipulate media as a learning resource and as a channel of information from the material delivered to students in the learning process [8].

The use of learning media in the learning process can generate new interests and desires, generate motivation and stimulation of learning activities, and bring psychological influences to students. At the learning orientation stage, learning media helps the effectiveness of the learning process and the delivery of messages and lesson content at that time

Natural Science or IPA is a part of science related to living things and the universe where an experiment is needed in conceptual reinforcement. IPA in English is known as natural science which is used to refer to a group of sciences where the objects are natural objects with definite and general laws. IPA discusses natural phenomena that are arranged systematically based on the results of experiments and observations carried out by humans.

IPA learning is carried out with simple investigations, not memorizing concepts. This learning can foster students' attitudes in formulating

problems and drawing conclusions, so that students are able to think critically through science learning [9]

Based on the explanation above, it can be concluded that science learning emphasizes critical thinking skills that provide direct experience so that students can remember, identify, and apply their knowledge scientifically. Therefore, teachers must be guided by the curriculum to plan learning.

Teachers are a profession that demands creativity, expertise, and role models for students. As a teacher, there is a need to be able to develop and use media so that learning becomes more effective. In learning, the use of media will make it easier for students to master the material optimally as expected.

Various learning media have been created along with the development of the era and the advancement of information technology today. Computerization of education has also made learning at every level of education experience significant changes from writing classes on paper to digital classes using laptops or desktop computers (PCs). There is an opportunity to create interactive learning media using technological devices that can be accessed on computers, tablets, and smartphones. Interactive learning media has benefits including (1) more interesting, (2) more interactive, (3) the amount of learning time can be reduced, (4) the quality of learning can be improved, and (5) learning can be done anywhere and anytime [10]. The aim of this research is to develop interactive learning media based on Android in science learning on space exploration material.

Method

The interactive media that will be developed is a media that can be used independently by students with the

availability of instructions for use. This interactive media can be used with the help of computers and smartphones with iOS OS. This media is used by users to press buttons to interact with the media. This learning media is created using the Articulate Storyline 360 application with an output format in the form of HTML5, Microsoft Word-based documents, Web Online, LMS, Articulate Online, DC, DVD, and kiosks. The use of this media does not require internet access and does not require additional special applications to operate it if used on a personal computer device.

The operation of this learning media can be done on a cellphone, previously it is necessary to download the "Articulate Mobile Player" application to get better results. This application can be downloaded from the Google Play Store or Apple Store. If you can't install it, just use the HTML5 output format. As a support, researchers use CorelDRAW X7 to create and edit visual content in the form of backgrounds, images and animations. Some of these software were chosen based on several considerations, including not requiring too high computer specifications to operate and not being difficult to operate.

This research is a Research and Development, which aims to produce products and test the feasibility of these products for learning activities. The approach to this method uses the ADDIE development model (Analysis, Design, Development, Implementation, and Evaluation).

Results

1, Model Development

a. Needs Analysis

The initial activity carried out in this interactive learning media development research is to conduct preliminary research in the form of a needs analysis of class VI

of Ciakar Elementary School, Tangerang Regency. This preliminary research aims to obtain data from schools on what is needed in developing interactive learning media for science subjects. The needs analysis was carried out by conducting a direct review and analyzing data obtained from Ciakar Elementary School, Tangerang Regency. The data analyzed includes data on the number of students, facilities and infrastructure, and data on learning outcomes obtained by students.

b. Analysis of Student Characteristics

The rapid development of technology is not in line with ongoing learning activities. In addition, students are already familiar with technology such as mobile phones or smartphones. From the characteristics of students who are familiar with the world of technology, learning media are needed that are in accordance with these characteristics in order to attract interest in learning. By utilizing technology such as mobile phones or smartphones, it can attract students' interest and motivation. The use of learning media that uses mobile phones or smartphones can facilitate independent learning activities.

c. Competency and Instructional Analysis

Learning activities for the subject of science for grade VI solar system with the theme of Exploring Outer Space with Basic Competencies (KD) are 1) Explaining the solar system and the characteristics of members of the solar system, 2) Making a model of the solar system. The Competency Achievement Indicators applied are

- 1) Getting to know the solar system with great curiosity, 2) Explaining the solar system in detail and 3) Being able to answer questions related to how members of the solar system work with great curiosity.

2. Final Model

The minimum specifications for running this interactive learning media application are as follows:

Table 1 Minimum Specifications for Interactive Media Hardware

| | |
|-------------------|---|
| CPU | 2.0 GHz processor or higher (32-bit or 64-bit) |
| Memory | 2 GB |
| Hard Disk | 500 MB available |
| Screen resolution | 1,024 x 768 px (1,280 x 800 px is the recommended resolution) |
| Multimedia | Sound card, microphone and web camera |

Table 2 Minimum Hardware Specifications for Interactive Media Software

| | |
|--------------------|-----------------------------|
| Operating system | Windows Vista SP2 or higher |
| .NET Runtime | .NET 4.0 or higher |
| Visual C++ | Microsoft Visual C++ 2013 |
| Adobe Flash Player | Adobe Flash Player 10.3 |

Table 3 Interactive Media Content Importer Specifications

| | |
|------------|---|
| Microsoft | PowerPoint 2007 or later (32-bit or 64-bit) |
| Articulasi | Presenter '09, Quizmaker '09, Engage '09 or later |

Table 4 Content Export Software

| | |
|--------------|---|
| Flash | Adobe Flash Player 10.3 or later` |
| Web Browsers | Windows: Internet Explorer 8 or later, Google Chrome (latest version), Mozilla Firefox (latest version) |
| HTML5 | Mac: Safari 7 or later, Google Chrome (latest version) |
| Apple iOS | Windows: Google Chrome (latest version) Mac: Safari 7 or later, Google Chrome (latest version) |
| Android OS | Mobile: Safari on Apple iOS 7, Google Chrome on Android OS 4.1 |
| CD/DVD | Articulate Mobile Player on Apple iOS 7 or later on iPad |
| Windows | Articulate Mobile Player on Android OS |

| | |
|-------|-----------------------------------|
| Flash | Adobe Flash Player 10.3 or later` |
| | 4.1 |

The software used as the main program to create and develop interactive learning media is using Articulate Storyline 360. The supporting program for creating interactive learning media is CorelDraw X7 with a 64-bit system for creating vector graphic images on learning media. The development stage is the stage to realize the design stage into a real and complete display using Articulate Storyline 360 software

- a. Implementation. At the implementation stage, it was carried out on three experts, namely material experts, learning experts, and media experts. In addition, individual tests were also conducted on three students. Then a small group trial of 9 students was carried out again. The trial was carried out by distributing questionnaires to test the feasibility of the interactive learning media that had been developed
- b. Evaluation. The evaluation stage was carried out simultaneously with the implementation stage. There were several notes given during the trial conducted by the media expert. These notes have been corrected by the researcher, so that they can be continued to the stage of describing the effectiveness of the model.

3. Individual Trial (One to One) against Experts Material Expert Test Results

Table 5: Subject Matter Expert Due Diligence Assessment

| No | Aspects assessed | Observation Result Score | Expected Score | Percentage of Eligibility Level |
|--------|------------------|--------------------------|----------------|---------------------------------|
| 1 | Theory | 25 | 27 | 85,71% |
| 2 | Learning | 15 | 17 | 100,00% |
| Amount | | 40 | 44 | 90,91% |

Learning Expert Test Results

Table 6 Teaching Expert Eligibility Test Assessment

| No | Aspects assessed | Observation Result Score | Expected Score | Percentage of Eligibility Level |
|--------|------------------|--------------------------|----------------|---------------------------------|
| 1 | Learning | 37 | 40 | 92,50% |
| Amount | | 37 | 40 | 92,50% |

Media Expert Test Results

Table 7 Media Expert Due Diligence Assessment

| No | Aspects assessed | Observation Result Score | Expected Score | Percentage of Eligibility Level |
|--------|------------------|--------------------------|----------------|---------------------------------|
| 1 | Communication | 16 | 20 | 75,00% |
| 2 | Technical Design | 20 | 23 | 87,50% |
| 3 | Display Format | 15 | 21 | 75,00% |
| 4 | Operation | 12 | 16 | 75,00% |
| Amount | | 63 | 80 | 78,75% |

2. Uji Coba Perorangan (One to One) terhadap 3 Siswa

Table 8 Individual Student Eligibility Test Assessment

| No. | Aspects assessed | Observation Result Score | Expected Score | Percentage of Eligibility Level |
|--------|------------------|--------------------------|----------------|---------------------------------|
| 1. | Content | 61 | 72 | 84,72% |
| 2. | Learning | 46 | 48 | 89,58% |
| 3. | Media | 143 | 168 | 86,90% |
| Amount | | 250 | 288 | 86,81% |

3. Uji Coba Kelompok Kecil

Table 9 Small Group Eligibility Assessment

| No | Aspects assessed | Observation Result Score | Expected Score | Percentage of Eligibility Level |
|--------|------------------|--------------------------|----------------|---------------------------------|
| 1 | Content | 189 | 216 | 87,50% |
| 2 | Learning | 125 | 144 | 86,81% |
| 3 | Media | 441 | 504 | 87,50% |
| Amount | | 755 | 864 | 87,38% |

Discussion

Material Expert

In the material expert test, assessments can be collected which are classified into two aspects, namely the material aspect obtaining a value of 85.71% and the learning aspect obtaining a value of 100.00% so that the results of the interactive learning media test on the science subject about space exploration obtained an overall value of 90.91%. So it can be interpreted that this learning media is suitable for use in learning activities. This is adjusted to the exposure of the data analysis techniques used. This is in accordance with Rohinah's statement which states that the ease of accessing the application makes students more interested in learning the material provided [11]. This is also in line with what was expressed by Novitasari who stated that the combination of interesting images, animations, and sounds will eliminate the boredom experienced by students because learning becomes less monotonous and makes students interested in learning the material presented [12]. This is also in accordance with the cognitive theory of learning by utilizing multimedia which has the potential to produce more meaningful and in-depth understanding and learning than presentations that are displayed in only one format, for example only in the form of images or words. For this suggestion, the media improvement that the researcher did was to decrease

Learning Expert

In the learning expert test, the assessment of learning aspects can be collected by obtaining a score of 92.50%. Thus, the results of the trial of interactive learning media for science subjects about space exploration obtained a score of 92.50%. So it can be interpreted that this learning media is suitable for use in learning activities. This is adjusted to the

exposure of the data analysis techniques used.

This is in line with what was conveyed by Widiastika who stated that the presence of android-based media can improve the quality of learning and attract students' attention which in the end can increase students' motivation in learning so that they are able to understand learning materials better and can achieve learning goals [13]. Students will tend to prefer interesting things such as image visualization, attractive colors, interesting animations so that they can improve understanding and learning outcomes.

Media Expert

In the media expert test, assessments can be collected which are classified into four aspects, namely (1) the communication aspect gets a score of 75.00%, (2) the technical design aspect gets a score of 87.50%, (3) the display format aspect is 75.00% and (4) the operational aspect is 75.00%, thus the results of the trial of interactive learning media for science subjects about space exploration get an overall score of 78.75%. So it can be interpreted that this learning media is suitable for use in learning activities. This is adjusted to the explanation of the data analysis techniques used. However, there are several notes given by media experts, including: adding a home button at the end of the material and clarifying the instructions for using the media in drag and drop.

This statement is in line with Sanjaya who stated that in compiling a learning media, it must be able to attract students' interest and be valid or authentic [14]. The creation of learning media must pay attention to the accuracy of learning objectives and support for the content of the subject matter which is factual, principled, and conceptual in nature so that it is easier for students to understand

[15]. This is in line with what was expressed by previous researchers who said that students need calm and concentration to think before doing something such as writing, speaking, or taking action [16]. Kuswanto in his research emphasized that the use of android-based learning media is suitable for use as a practical, economical learning media, and in accordance with the facilities owned by students [17].

Individual Trial 3 Students

The results of the interactive learning media trial evaluation on the science subject conducted by 3 students were reviewed in three aspects, including (1) the content aspect obtained a score of 84.72%, (2) the learning aspect obtained a score of 89.58%, and (3) the media aspect obtained a score of 86.90%. Overall, the results of the trial on these three students obtained a score of 86.81%. Based on the data analysis technique used, this value can be interpreted that this learning media can be categorized as suitable for use in science learning activities.

Small Group Trial

The results of the interactive learning media trial evaluation on the science subject conducted by 9 students were reviewed in three aspects, including (1) the content aspect obtained a score of 87.50%, (2) the learning aspect obtained a score of 86.81%, and (3) the media aspect obtained a score of 87.50%. Overall, the results of the trial on these nine students obtained a score of 87.38%. Based on the data analysis technique used, this value can be interpreted that this learning media can be categorized as suitable for use in science learning activities. The advantages and disadvantages of this interactive learning media are as follows:

The advantages of interactive media are 1) Making it easier for teachers to teach science to students in class, 2)

Saving teachers' time to explain the pictures of planets available in this interactive learning media, 3) This media is not bound by space and time, it can be used anywhere, 4) Can attract students' attention in the learning process.

The disadvantages of interactive media are 1) If electronic devices (PC, Laptop, and Smartphone) are not available, this learning media cannot be used, 2) In terms of content, this interactive learning media only contains one sub-theme so it cannot facilitate one space exploration theme, 3) The feasibility test was only carried out on small groups with 9 participants and has not been carried out on large groups, due to the limited time available to the researcher.

Conclusion

Interactive learning media on the science subject with the theme of space exploration for class VI which was developed based on the ADDIE model was able to facilitate teachers and students in learning activities at SD Ciakar, Tangerang Regency. This is based on the positive response obtained from the results of field trials conducted on students. Overall, interactive learning media can be said to be suitable for use in learning activities. This is based on the results of individual trials conducted by 3 experts, namely material experts who obtained an overall assessment result of 90.91%, learning experts who obtained an overall assessment result of 92.50%, and media experts who obtained an overall assessment result of 75%. In addition, individual tests were also conducted on 3 students with an overall score of 86.81% and small group tests for 10 students with an overall assessment of 87.38%.

References

1. Abu Ahmadi, Nur Uhbiyati (2015), Ilmu Pendidikan, Jakarta: Rineka Cipta
2. Ismail Suardi Wekke, Ridha Winda Astuti (2017), Kurikulum 2013 di Madrasah Ibtidaiyah: Implementasi di Wilayah Minoritas Muslim, Jurnal Tadris, Vol. 2 No. 1
3. Faizal Djabidi (2017), Manajemen Pengelolaan Kelas, Cilegon: Madani
4. Sari, R. R., Febrini, D., & Walid, A (2021). Tantangan Guru Pai Dalam Menghadapi Era Perubahan Globalisasi Teknologi Industri 4.0 di SMA Negeri 01 Bengkulu Tengah. GHAITSA: Islamic Education Journal, 2(1).
5. Fauzi, A. E. N. (2020). Pelatihan Guru dalam Menghadapi Era Globalisasi. Jurusan Teknologi Pendidikan, Fakultas Ilmu Pendidikan, Universitas Negeri Malang
6. Asyhar, R. (2012). Kreatif Mengembangkan Media Pembelajaran. Jambi: Gaung Persada
7. Juniati, L., Destrinelli, D., & Hayati, S. (2022). Pengembangan Media Video Animasi Menggunakan Aplikasi Animaker Pada Tema 7 Subtema I Kelas I Sekolah Dasar (Doctoral dissertation, Universitas Jambi).
8. Djamarah, Syaiful Bahri. (2006). *Strategi Belajar Mengajar*, Jakarta: PT Rineka Cipta.
9. Susanto, Ahmad. (2013). *Teori Belajar dan Pembelajaran Di Sekolah Dasar*. Jakarta: Kencana.
10. Daryanto. (2010). *Media Pembelajaran: Cetakan I*. Bandung: Satu Nusa.
11. Rohinah. 2016. "Pengembangan Aplikasi Bahan Ajar Pendidikan Agama Islam Berbasis Android Di Sekolah Menengah Atas." Al Athfal: Jurnal Pendidikan Anak.
12. Novitasari, D. 2016. *Pengaruh penggunaan multimedia interaktif terhadap kemampuan pemahaman konsep matematis siswa*. FIBONACCI: Jurnal Pendidikan Matematika Dan Matematika, 2(2).
13. Widiastika, Milda Asti. Nana Hendracipta.A. Syachruroji. 2021. *Pengembangan Media Pembelajaran Mobile Learning Berbasis Android pada Konsep Sistem Peredaran Darah di Sekolah Dasar*. Jurnal: Basic Edu, Volume 5 Nomor 1.
14. Sanjaya, Wina. 2012. *Media Komunikasi Pembelajaran*. Jakarta: PT Kharisma Putra Utama.
15. Sutikno, M. Sobry. 2009. *Belajar Dan Pembelajaran*. Jakarta: PT Elex Media Komputindo.
16. Akhmad, F., & Fahrudin, I. 2016. *Korelasi Antara Self Confidence Dan Personality Dengan Hasil Belajar Matematika*. Disampaikan pada Semnas UNY. Universitas Negeri Yogyakarta.
17. Kuswanto, J. 2018. *Media Pembelajaran Berbasis Android Pada Mata Pelajaran Sistem Operasi Jaringan Kelas XI*. Jurnal Media Infotama, 14(1).