Development of Interactive Multimedia Based on Powerpoint in Science Learning in Elementary School

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ABSTRACT

This study discusses the development of interactive multimedia learning media based on PowerPoint software in science learning in elementary schools. This study aims to produce interactive multimedia media, especially in science learning in elementary schools that are valid, practical, and effective. The type of research used is Research and Development (RnD). That is the development of interactive multimedia based on PowerPoint software in science learning. The development model used is the ADDIE model (Analyze, Design, Development, Implementation, and evaluation). The output of interactive multimedia based on PowerPoint Software is in the form of files that can be installed easily, making it easier for students in the learning process. Based on the research results, this interactive multimedia is valid, practical, and effective.

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1.   INTRODUCTION

Education in Elementary School loading a number of eye lessons. A number of eye lessons Among others, namely Religious Education, Indonesian, Education citizenship, Mathematics, Science (Science Knowledge Nature), Art Culture and Craft, Social Studies (Science Knowledge social), as well as Education Physical Sports and Health. one eye lessons at the level Elementary School that is Knowledge Knowledge Nature (IPA). IPA is one eye lesson in Elementary School (SD) which are the object of the study related to life human. In creating material IPA which creative, innovative, effective, and fun they should teacher create a product form of learning media which right.

by general implementation learning specifically science learning yet running optimally. Still found a number of problems, such as implementation still learning centered on the teacher. Condition this show that learning is done teacher by whole not yet maximum and the learning process still uses approach learning conventionally dominated by lectures. The same thing was also found in the results of research, namely learning is still teacher-centered, lack of opportunity for students get experience direct good observation, ask, try, cultivate information, and communicate, monotonous, partially

students not yet active during the learning process, and learning given by the teacher more dominated lecture (Desyandri, 2019) The teacher is the spearhead of the learning process in the classroom. In this concept,

the teacher's ability must be realized incompetence is a determining factor for the success of the implementation of learning, especially science learning. In the implementation of learning, students need to be encouraged to be more active during the learning process. This is in line with the scientific approach taken by the teacher in the learning process in the classroom starting from observing, questioning, reasoning, analyzing, inferring, and communicating. In that regard, it is necessary for teachers who master the optimal learning process (Bentri, 2017). The teacher is the determining factor in achieving the brilliance of education. Even though there are good curricula and complete facilities, if no there are teachers who have competence high, then her brilliance education is difficult to achieve during the learning process (Nellitawati, 2018).

The learning process in elementary schools should emphasize more direct experience to students, in accordance with the statement (Yanti: 2017) that the learning process Emphasis on giving experience direct to develop competence to explore and understand natural around by scientific. because of that learning media needed to support learning Becomes more optimal.

Learning media is a kind of material (material), device, setting, equipment and person where is student could interact directly with the media that has a destination for facilitating learn and change to a direction which more ok performance in learnig. Development technology demand educator for to do innovation in learning one with developing teaching materials in form electronic interactive multimedia based (Nur Atikah, 2021)

World always change and develop. We are currently in the industrial revolution 4.0, and the world of education is no exception, which focuses on digitalization. Face anti-mainstream challenge, required creativity and innovation. Now is the era of disruptive technology in this day and age this show much chaos and turmoil in the system of life ever considered established. To face the challenges of this anti-mainstream era, creativity and innovation are needed. at the time of the revolution Industry 4.0, the education system tends to take advantage of the visualization of digital technology, which is used a as tool for an effective, efficient, interesting and interactive learning prprocess one of which is with using interactive multimedia (Yosi Fimala, 2022) by philosophical, media learning based on interactive this need developed because could help a teacher in the process. With media learning interactive multimedia based this is contains color pictures with views which interesting student for more spirit in study.

Priyanto (2009:51) states that multimedia is mixture on multiple media in give information and messages in the form of audio, video, text chart or animation graphics. Multimedia includes hypermedia and hypertext. Hypermedia is an format presentation multimedia which includes, video, movie text, and shut up or animation. Whereas Hypertext that is table, diagram static, image and form text yang shown and arranged by not linear.

According to Harjono (2015: 10) multimedia is divided Becomes two categories, namely: linear multimedia and interactive multimedia. Linear multimedia is a multimedia that does not be equipped with tool controller whatever can operated by users, for example TV and movies. Interactive multimedia is a multimedia equipped with tool controller that can operated by the user, so that user could choose what do you want for the next process. Examples of interactive multimedia are: learning multimedia interactive, game applications, and others.

According to Yulia (2016: 160) interactive media is one alternative learning media which can used in increase quality education, make student can learn independent, start as well as end lesson in accordance with his wish well as repeat material which not yet understood by clear. for train student find as well as compose alone knowledge which obtained, then media interactive which served made based on constructivism by theoretical, there a number of expert who stated that how the importance of learning media interactive multimedia based this developed, because the learning media interactive multimedia based this have advantages. According to Fatmala (2016: 4) advantages of learning media based on interactive multimedia on: (1) Students could interact direct with learning media. Learning

media this could support activity study student by independent. Learning media this could operated use computers, laptops, and cellphones or tablets, (2) By this whole medium containing Basic Competence (KD), material science learning, sounds, animations, pictures, and question for evaluate understanding student to given material .

In make learning media interactive multimedia based this need use applications and software, including PowerPoint, Canva, Powtoon, Prezi, Sparkol Videoscribe, Lectora, Sigil, Wondershare Filmora. of all applications and software that, researcher use PowerPoint software. Researcher choose PowerPoint software this because have a number of advantages from other applications, namely (1) in no media creation must connected with internet, (2) inexpensive, (3) not paid, (4) no need install application because Power point available on all windows computers or laptop, so it is easy for teachers and students access it, (5) can applied and accessed anywhere, such as computer, laptop, or Cellphone (HP).

Based on result observation what did researcher at show that SDIT Nurul Ilmi Pariaman have a computer laboratory. There are several the gap that occurs during the learning process. Among them in the learning process teacher only use source study from book curriculum 2013. No teacher yet using computer as means learn or learning media. Limited teacher knowledge in develop media learning based interactive multimedia cause student passive in learning. Teacher not yet create media which more innovative so that make learning feel boring. thing this is can seen with lack of enthusiastic student on eyes Science lesson, because student no have picture real about how process material on eyes lesson IPA happens in nature around the actual. By because it's media very important for support learning.

Use of media based on multimedia interactive not yet used on learning, so that student experience difficulty for understand Theory lessons that are concepts, symptoms and principles in science material. because of that the teacher should create interesting learning possible especially in science learning. For example that is with use PowerPoint. In Thing this location interactive on PowerPoint this found in practice because, where every student who answered Correct or wrong will given reply emoticons already provided in return from the answer given students .

Not only that, difficult student understand Theory will cause destination learning no achieved in 1 meeting times because limited time, so will add burden to Theory next. This thing because interest learn participant educate still less so that participant educate difficulty in understand material. In process learning student only as receiver information from teacher because technique the learning use communication by verbal make student feel bored. Student less get wide opportunity for convey ideas or ideas, develop experience and the potential it has. And the lack of interaction between student and teacher when the teacher explains learning because which student do only see text or readings and only listen to explanation from the teacher.

From the results of the 1st semester MID student science lesson Class V SDIT Nurul Ilmi Kota Pariaman year the 2021/2022 school year is low, with Criteria Minimum completeness (KKM) 80, still there are 13 people or 56% of students who are declared not yet finished. While 10 people or 44% are new reached the KKM of 23 students. by empirical, based on problems that have been explained previously no in accordance with expected learning. Based on exposure background background above, there is problems in class V, especially in science learning. because of that researcher choose eye science lessons and class V as object research. So that researcher interested for do research and development with title "Interactive Multimedia Development based on PowerPoint Software on Science Learning in Elementary Schools".

2. METHODS

This type of research is a type of research development (Research and Development) that is oriented on products developed in education fields that aim to improve the effectiveness and understanding of material students in learning nor the result. Study use model study adapted from the ADDIE development model (Analyze, Design, Develop, Implement, and Evaluate). The ADDIE model began to exist in the 1990s which was developed by Dick and Carry.

The instrument is used to collect data during the process of developing interactive multimedia-based learning media in the form of questionnaires, documentation, and student learning outcomes tests. The questionnaire was prepared covering three types adapted to respondents from the study. The questionnaires are questionnaires for validity testing by material and media experts, questionnaires for practicality tests by students, and effectiveness tests through evaluation of student learning outcomes.

This research uses several techniques for data collection, namely observations, interviews, documentation, questionnaires, and tests. The data obtained through activities trials in testing the validity and practicality of interactive multimedia based on PowerPoint software are grouped into two, namely qualitative data and quantitative data. Qualitative data in the form of criticism and suggestions put forward by validator and students were collected to improve this interactive multimedia-based learning media product. Quantitative data obtained from the questionnaire was then converted to quantitative data on scale 5 (Likert scale) to know the quality of the product with the following description.

Table 1. Likert Scale Quantitative Data

Aspect	Symbol	Mark
Very good	(SB)	5
ok	(B)	4
Enough Good	(CB)	3
less	(K)	2
Very Less	(SK)	1

Furthermore, the results of the questionnaire are analyzed by looking for the average rating. Obtaining the average score from each component aspect assessment using the formula :

$$= \frac{\sum x}{n}$$

where :

⊚	=	Average Score
P	=	The number of total scores of each component.
N	=	Total validator/evaluator

Conversion scale the five are using the reference conversion on Approach Reference Benchmark (PAP) which was developed by Eko (2009: 238) as table below this :

Table 2. Conversion of Value

Quantitative Data	Score		Criteria
	Formula	Average Score	
5	X > Xi + 1.8 Sbi	X > 4.2	I'm very good
4	Xi + 0.6 Sbi < X Xi + 1.8 Sbi	3,4 < X 4.2	ok
3	Xi - 0.6 Sbi < X Xi + 0.6 Sbi	2.6 < X 3.4	Enough
2	Xi - 1.8 Sbi < X Xi - 0.6 Sbi	1.8 < X 2.6	less
1	X Xi - 1.8 Sbi	X 1.8	lack

Source: (Widoyoko, 2009)

In this research, is determined value feasibility product with a minimum of "3.4" with the category "Good", so that results from research, both from experts in material, experts in media, and students, it

has obtained final assessment results with the minimum value, then product as the result of the development is considered worthy to be used.

3.   FINDINGS AND DISCUSSION

3.1. *Development of Interactive Multimedia Learning Media*

By the objectives and development procedures used in the research that the researcher has carried out, the data obtained from the research are as follows.

Stage of Analysis (Analysis)

1. Needs Analysis
    a.   Analysis of Student Needs and Problems
    b.   Analysis of Student Characteristics
    c.   Institutional Needs Analysis
2. Target Analysis
3. Curriculum Analysis
4. Revision

Design Phase (Design)

1. Determining Media Development Software
2. Selecting a Presentation Format
3. Making interactive multimedia-based learning media
    a.   The initial view contains the subject title, class, and start navigation buttons.

Figure 1. Initial Product Appearance

    b.   After the user clicks the "start" navigation button, the user will enter the menu page. On this page, there are several menus that students will choose from including instructions, indicators, materials, questions, and profiles.

Figure 2. Menu display

1) Hint Display

Figure 3 . Hint Display k

2) Indicator Display

Figure 4 . Display indicators

3) Material Display

Figure 5 . Material display
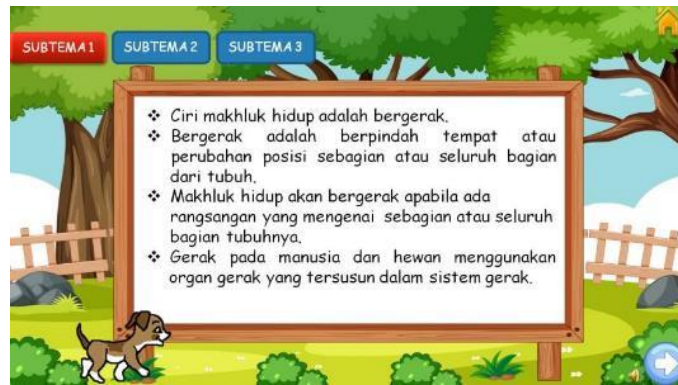

Figure 6. Display sub-theme title

Figure 7. Material display

4) Question Display

The question display contains the intro display for themes 1, 2, 3, 4, and 5 as shown in the following picture

Figure 8. The initial view of the first question

Figure 9. The initial appearance of the subject matter

Figure 10. Question display

5) Profile

Figure 1 1 . Profile View

a) Designing Media with Various Animations and Images.
b) Compiling Questionnaire

Development Phase (Development)

The interactive multimedia development stage based on PowerPoint software includes validity and practicality tests.

Implementation (Implementation)

This implementation phase tests the effectiveness of interactive multimedia. In development research to see the effectiveness of product trials can be done by experimentation, namely by comparing the effectiveness of the old work system with the effectiveness of the new work system.

Data analysis aims to explain the results of the trial data. The test results are used as the basis for revising the developed materials.

3.2. Validity Data Analysis

Table 3. Overall validation results

Validator	Average	Category	Interactive Multimedia Validity
Thematic Content Expert	4	Well	4,38 (Very Good)
Linguist	4.8	Very good	
Content Expert	4	Well	
Language Constructor	5	Very good	
Media Expert	4.1	Well	

From the results of the validity with an average of 4.38, it can be said that interactive multimedia based on PowerPoint software is "very good". Thus, interactive multimedia based on PowerPoint software is already valid for testing.

3.3. *Practical Data Analysis*

Table 4. Overall practical results

Validator	Average	Category	Interactive Multimedia Practical
Teacher	4.8	Very good	4.7 (very practical)
Student	4.7	Very good	

From the practical results with an average of 4.7, it can be said that interactive multimedia based on PowerPoint software is "very practical". Thus, interactive multimedia based on PowerPoint software is already practical to use in testing effectiveness.

3.4. *Effectiveness Data Analysis*

Table 5. Posttest calculation data

No	Descriptive statistics	Pretest	Posttest
1	Average	70	86
2	Standard deviation	8.96	6.76
3	Variance	80.28	45.67
4	Lowest value	40	73
5	The highest score	80	93

The test results obtained stated that 91% of the fifth-grade students at SDIT Nurul Ilmi scored above the KKM after using interactive multimedia based on PowerPoint Software. Based on the previous researcher's determination that if 85% of the fifth-grade students at SDIT Nurul Ilmi get a score above the KKM after using interactive multimedia based on PowerPoint software, then this product is declared effective. This is by what was stated by Sugiyono (2016), that the new work system will be effective if the value after treatment is greater than the value before treatment. Based on the research results, interactive multimedia based on PowerPoint software is effective for increasing students' knowledge.

4. CONCLUSIONS

After conducting the research, the research data were then analyzed, so from the data analysis it can be concluded that the results are as follows: Based on the results of the validator, interactive multimedia based on PowerPoint software got an average score of 4.38 with the criteria of "Very Good". Thus, interactive multimedia based on PowerPoint software that has been developed is very valid and can be used for the learning process, especially science learning for grade 5 semester 1; PowerPoint software-based interactive multimedia is very practical to use. This is known from the results of practicality by giving a questionnaire to 1 teacher and 11 students at SDIT Nurul Ilmi Pariaman City. The average score of the teachers is 4.8 with the criteria of "Very Good", and the average score of the students is 4.7 with the criteria of "Very Good". Thus, interactive multimedia based on PowerPoint software gets an average score of 4.7 with the "Very Practical" criteria. This means that grade 5SD students are greatly helped in understanding the material by learning to use interactive multimedia based on PowerPoint software; PowerPoint software-based interactive multimedia is very effective to use. This is known from the results of the students' pretest and posttest. The test results obtained stated that 91% of the fifth-grade students at SDIT Nurul Ilmi scored above the KKM after using interactive multimedia based on PowerPoint Software. Based on the previous researcher's determination that if 85% of the fifth-grade students at SDIT Nurul Ilmi get a score above the KKM after using interactive multimedia based on PowerPoint software, then this

product is declared effective. Based on the results of the analysis, interactive multimedia based on PowerPoint software is effective for increasing students' knowledge.

REFERENCES

Atikah, Nur, N.G. (2021). Validitas E-Modul Matematika Sekolah Dasar Berbasis Pendekatan Realistic Basicedu, 5 (6) 6104-6108

Bentri, A. (2017). Mastery of Primary School Teacher Pedagogy Competency. Couns-Edu, 78-84

Desyandri, M.M. (2019). Development of Integrated Thematic Teaching Material Used.

Jurnal Konseling dan Pendidikan, 16-22

Fandi, A, Z & Solfema. (2022). The Relationship Between Parents' Attention And The Emotional Development Of Early Childhoods In The Ujung Gurun Village, Padang City. Jurnal Pendidikan Luar Sekolah, 10(2), 341-348

Fatmala, D., & Yelianti, U. (2016). Pengembangan Media Pembelajaran Multimedia Interaktif Berbasis Android pada Materi Plantae untuk Siswa SMA Menggunakan Eclipse Galileo. Biodik, 2(1), 1–6.

Fimala, Y dkk. (2022). Blended Learning LKPD Development Based on Learning Using Nearpod Applications for Integrated Learning in Elementary School. Journal of Innovation in Educational and Curtural Research, 3(2), 97-105

Fitria, Y. (2017). Efektivitas Capaian Kompetensi Belajar Siswa Dalam Pembelajaran Sains Di Sekolah Dasar. Jurnal Inovasi Pendidikan Dan Pembelajaran Sekolah Dasar, 1(2).

Gistituati, N & Nur, A. (2022) E-Module Based on RME Approach in Improving the Mathematical Communication Skills of Elementary Students. Jurnal Ilmiah Sekolah Dasar, 6(1) 106-115

Harjono, A., Gunawan, & Sutrio. (2015). Multimedia Interaktif dalam Pembelajaran Konsep Listrik Bagi Calon Guru. Jurnal Pendidikan Fisika Dan Teknologi, 1(1), 9–14.

Hidayati, Abna, dkk. (2022). Supporting Factors for the Implementation of Mobile Learning for Elementary School Students Using an Authentic Approach and Real-World Activities. EBSCO, 16(5), 107-120

Miaz, Y dkk (2019). Educative Learning Media for Elementary School Students. Atlantis Press, 382, 722-727

Nellitawati. (2018). Motivation and innovation role of school's principal in improving teacher professionalism. Couns-Edu, 3(2) 2548-3498

Neviyarni, S & Rita, N. (2022). Group Guidance Services with Self-Management Techniques to Reduce Students' Verbal Aggressive Behavior. Bisma The Journal of Counseling, 6(1), 25-31

Nora, N & Mudjiran. (2021). Student Perceptions About The Personality Competence Of The Academic Advisor And Its Role In Helping Student Learning Success. NeoKonseling, 3(2), 102-109

Priyanto, D. (2009). Pengembangan Multimedia Pembelajaran Berbasis Komputer. 14(1), 1– 13.

Sari, P, F & Irdamurni. (2019). Efektivitas Prosedur Pengukuhan Negatif Untuk Mengurangi Perilaku Menyimpang Anak Autis. Ranah Research, 1(4), 1100-1105

Sugiyono. (2016). Statistika untuk Penelitian. Bandung: Alfabeta

Taufina, dkk. (2019). Development of Statistics in Elementary School Based RME Approach with Problem Solving for Revolution Industry 4.0. Atlantis Press, 382, 716-721

Widoyoko, S. Eko Putro. (2009). Evaluasi Program Pembelajaran. Yogyakarta: Pustaka Belajar

Yulia Sari, L. (2016). Uji Efektivitas Media Pembelajaran Interaktif Berorientasi Konstruktivisme Pada Materi Neurulasi Untuk Perkuliahan