

Development of Application-Based BioSik (Biologi Asik) Learning Media *Android* Use *Power Point* for Class X High School Biology Learning Material *the animal*

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Abstract. Technological developments are increasingly rapid, making the world of education have to adapt. Changes in behavior and lifestyle influenced by technology create various positive and negative impacts. The negative impact felt in the world of education is students' dependence on *gadgets/cellphones*, apart from that, unwise use creates challenges for teachers in creating new innovations so that the learning process becomes more fun than playing *gadget/cell phone* in the classroom. So researchers conducted research on application-based media development *android* use *power point* for class X learning material *the animal*. The aim is to develop valid, practical and effective learning media to support students' learning process. This research is research *Research & Development* (R&D) using the ADDIE model which consists of the processes of Analysis, Design, *Development*, Implementation, and Evaluation. The development went through 3 stages, namely validity testing, practicality testing, and effectiveness testing which was carried out at SMA PGRI 6 Banjarmasin (Trial 1) and SMA PGRI 1 Banjarmasin (Trial 2). The results of the media validity test carried out by five expert validators were 4.0, namely in the "Valid" category, while the results of the teacher respondents' practicality test in trial 1 was 3.6 in the "Practical" category and in trial 2 it was 5.0 with the "Very Practical" category, then for student respondents at SMA PGRI 6 Banjarmasin (31 people) it was 4.0 with the "Practical" category, the results of the practicality test at SMA PGRI 1 Banjarmasin (20 people) were 4.2 with the category "Practical" and the results of the media effectiveness test showed that the percentage in trial 1 of the first meeting was 78%, in the second meeting it was 79% in the "Effective" category, while in trial 2 the percentage was 86% in the first meeting and at the second meeting 91% were included in the "Effective" category.

Keywords: application *android*, *the animal*, biosik, biology learning media, development

1. Introduction

In today's development, the world of education continues to experience significant changes. Based on this, the world of education must align education itself with technological developments, in this case in order to prepare competent students who have skills and can fulfill the desired classification in the real world of work (Andrian, and Maksun, 2020).

Another phenomenon that can be said to be a driving factor in changing the behavior of the world community, including Indonesia, is the COVID-19 pandemic phenomenon which attacked the entire world in the last year of 2019. As a result of this pandemic, Indonesia itself had to reduce the learning from home policy and to meet these changes all elements of society especially parents, students and teachers must prepare new learning methods. The learning method that can be used during the pandemic is the online learning method *online* from home use *smartphone/gadget*. On learning *online* which is implemented, many parents buy it *gadget* for their children (students) so that they spend a lot of time with *gadget*-only (Isrokatun et al, 2023).

However, entering the second year after the COVID-19 pandemic, the world has recovered gradually, including Indonesia, but it cannot be denied that the COVID-19 pandemic phenomenon that has occurred is the starting point for the progress of technological development in the world of education in Indonesia. Study from home/study policy *online* is no longer enforced but due to changes

in habits during the pandemic, everything is all about technology (*gadget*) it is not surprising that students become less interested in learning when the old learning system which tends to be monotonous and boring at school returns. This condition shows that traditional learning is actually boring and ineffective (Astuti et al, 2020).

School learning in general is still teacher-centered so that students become more passive when learning, plus the textbook-oriented nature of learning is too dominant, making the teacher's impression in the learning process look like a lecture (Imansari et al, 2019). The big influence of technology and information can create new opportunities in the learning process, especially in the learning media used. Basically, in the learning process there is a tendency that allows education to be oriented towards students not only in school, but also outside the school environment because there are more and more choices of learning resources provided to enrich the knowledge of the students themselves ((Sunarto et al, 2020).

Technological developments are useful as supporting the learning process, one way is by developing various types of innovative and diverse learning media. The role of learning media cannot be separated from the teaching and learning process (Firmadani, 2020). Application-based learning media *android* that is inside *smartphone/gadget* is one example of media that can be developed today. Applications *android* which was deliberately developed to make it possible to attract students' critical thinking abilities. Learning material can be presented in an interesting, interactive way, and students can learn anywhere and anytime (Sa'diyah et al, 2021). Thus, seeing the potential for developing application-based learning media *android* for direct classroom learning it cannot be said to be impossible. This is the background for the author wanting to develop an innovative learning media by utilizing an application base *android* simple to use *power point* to support the teaching and learning process and increase students' interest in learning in class. In its development the author will take material *the animal* as a topic that will be raised later, considering that this material is a complicated material and requires deep understanding in order to understand the content.

2. Methods

The research method used is the research method *Research and Development (R&D)*. Research and development or R&D methods are processes and steps to develop a new product or improve an existing product so that it can be accounted for. Products are not always objects/hardware, such as books, modules, learning aids, but can be software, such as computer programs for data processing, classroom learning, libraries/laboratories, or models of education, training, guidance, evaluation, management, and others (Putra et al, 2023). As the name suggests, R&D is understood as research activities/actions that begin with research, then continue with development. So for the research model that will be used in the research *Research and Development (R&D)* is the ADDIE model which consists of the Analysis, Design, Development, Implementation and Evaluation stages. The five stages of the ADDIE development model can be observed in chart form as follows:

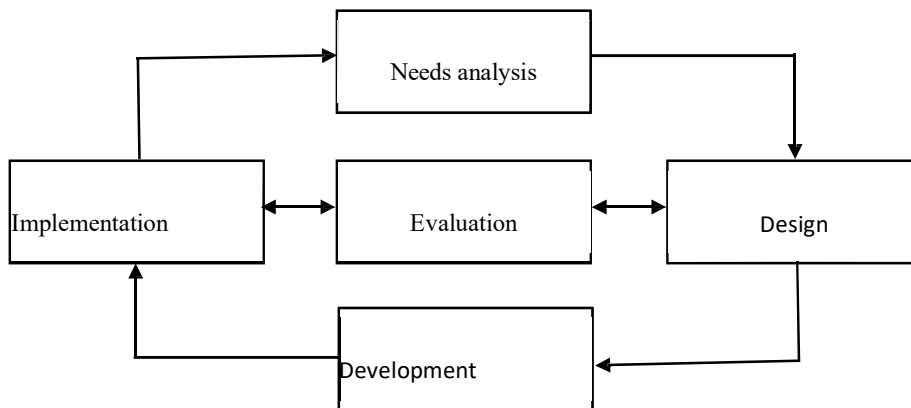


Figure 3. 1 ADDIE development model Source: (Report et al., 2022)

In the research and development of BioSik (Fun Biology) learning media, the test subjects consisted of 3 subjects, namely validity test subjects, practicality test subjects, and effectiveness test subjects. Place and time of trial, trial 1 was carried out at SMA PGRI 6 Banjarmasin and trial 2 was at SMA PGRI 1 Banjarmasin over a period of at least 3 months. The type of data taken is qualitative data and quantitative data using data collection instruments in the form of validation sheets, *questionnaire/questionnaire*, sheet *pre-test/post-test*, and documentation. The following are the data analysis techniques used in the research:

a. Validity Data Analysis Techniques

Validity data is taken from the total scores on the validation sheets of expert validators which are calculated thoroughly and then the average value of these scores is calculated using the formula below:

$$\bar{x} = \frac{\sum x}{N}$$

\bar{x} = average score

$\sum x$ = total score obtained

N = number of frequency of question indicators/aspect items

Source adapted (Rustandi and Rismayanti, 2021)

The average score obtained by each expert validator is combined after that the final score is calculated to determine the level of validity of the application-based learning media *android* BioSik simply uses the following average formula:

$$\bar{x} = \frac{1}{M} \times \frac{\sum_i^n x_i}{N}$$

Information :

\bar{x} = average score

$\sum_i^n x_i$ = total score obtained

N = number of frequency indicators/aspect items

M = number of respondents

Source: Adapted (P. Wulandari *et al.*, 2019)

The results of the data obtained will be reviewed for the level of validity in accordance with Bloom's adaptation of categorization below:

Table 3. 1 Validity Category

Category	Information
$4.5 \leq \text{validity} \leq 5.0$	Very valid
$3.5 \leq \text{validity} \leq 4.5$	Valid
$2.5 \leq \text{validity} \leq 3.5$	Fairly valid
$1.5 \leq \text{validity} \leq 2.5$	Not valid
$\text{validity} \leq 1.5$	Invalid

Source: (Nefianthi, 2016)

b. Practical Data Analysis Techniques

Data on the practicality of the learning media being developed was obtained from the sum of the overall assessment scores on questionnaire/ questionnaire responses from teachers and students and then the average score is calculated. The following is the formula used to calculate practicality data:

$$\bar{x} = \frac{\sum x}{N}$$

Information :

\bar{x} = average score

$\sum x$ = total score obtained

N = total frequency of respondents

Source: Adapted (Rustandi and Rismayanti, 2021)

The final average data obtained is then adjusted to the practicality level category to find out where the practicality level of the media that has been developed is. The following is a table of practicality categories:

Table 3. 2 Practicality Category Tables

Category	Information
$4.5 \leq \text{practicality} \leq 5.0$	Very practical
$3.5 \leq \text{practicality} \leq 4.5$	Practical
$2.5 \leq \text{practicality} \leq 3.5$	Quite practical
$1.5 \leq \text{practicality} \leq 2.5$	Not practical
$\text{practicality} \leq 1.5$	Not practical

Source: (Nefianthi, 2016)

c. Effectiveness Data Analysis Techniques

The data analysis technique to determine the level of effectiveness of cognitively developed learning media in development research is to use the normal formula-*Gain*, which will later compare the two assessment score results via *post-test/pre-test* from the students at two meetings. Normal formula-*Gain* detailed as follows:

$$G = \frac{\text{shoes post test} - \text{shoes pretest}}{\text{shoes ideal} - \text{shoes pretest}}$$

G= normal gain

Source: (Ma'aniyah, 2019)

The results of Normal Gain are analyzed according to the Normal-*gain* below this:

Table 3. 3 N-gain criteria

Rate-rate	Criteria
$G > 0,7$	High
$0,3 \leq G \leq 0,7$	Currently
$0 < G < 0,3$	Low
$G \leq 0$	failed

Source: (Safitri and Cacik, 2023)

Then converted into a percentage, the normal result score-*gain* multiplied by 100% then interpreted the percentage value obtained to determine the level of effectiveness of learning media, according to Hake (1999) n-effectiveness interpretation category *gain* are as follows:

Table 3. 4 Categories of N-Effectiveness Interpretation Gain

Percentage (%)	Category
>76	Effective
56-75	Quite effective
40-55	Less effective
<40	Ineffective

Source: (Nawir & Khaeriyah, 2019)

3. Results and Discussion

Data from development research was obtained from the results of validity tests, practicality tests and effectiveness tests. In validity testing carried out by expert validators involving one media expert, one language expert, one material expert, and two expert practitioners in the field of IT/Information Technology with the aim of determining the level of validity of the BioSik learning media that has been developed. The five expert validators assessed all aspects starting from media, language and material contained in the BioSik learning media. The practicality test involved 2 Biology teacher respondents and 51 students. The first trial was carried out at SMA PGRI 6 Banjarmasin involving 31 class X students and 20 class *questionnaire*, while in the effectiveness test the data was obtained from students who filled in the data *pre-test/post-test*. The following are the results of the data obtained by researchers:

1. Validity Test Result Data

Table 4. 1 Validity Test Results

Field Aspects of Evaluation	Validator Assessment Score					Amount	Replay
	V1	V2	V3	V4	V5		
Media	4,0	3,8	4,1	3,6	4,5	20,0	4,0
Language	4,1	3,9	4,0	3,7	4,1	19,8	4,0
Material	4,1	4,0	3,9	3,7	4,5	20,2	4,0
Amount							12,0
Rerate							4,0
Category							Valid

The results of the validity test data based on the assessment aspects assessed by 5 expert validators showed that the media assessment data was at 4.0 in the valid category, the language assessment was at 4.0 in the valid category, and the material assessment was at a score of 4.0 in the valid category. The results of the three assessments are then added up and a result of 12.0 is obtained which will then be divided by the frequency of the number of items (three main aspects, media, language and material) to obtain a total average result of 4.0 with a category including "Valid". The use of learning media fosters students' interest in learning new things in the learning material that has been presented by the teacher so that it can be easily understood (Nurrita, 2018). BioSik learning media obtained a validity level in the valid category so that it can be considered as an innovative media that can foster interest in learning and as an intermediary for delivering material by teachers so that it is easily understood by students.

2. Practicality Test Results Data

Table 4. 2 Practicality Test Results (Teacher Respondents)

Trial 1	Amount	Rerate	Category
Suratno W. S., S.Pd.	18,0	3,6	Practical
Trial 2	Amount	Rerate	Category
Nur Amelia, S.Pd.	25,0	5,0	Very Practical

The results of the practicality test data for teacher respondents obtained an average score in trial (1) of 3.6 in the "Practical" category and trial (2) obtained an average score in the practicality test assessment of 5.0 in the "Very Practical" category.

This proves that BioSik learning media is practical and can be used in the learning process of students anytime and anywhere.

Table 4. 3 Practicality Test Results (Students' Responses)

Trial 1	Respondent			31 Students	
	Very Practical	Practical	Quite Practical	Amount	Replay
	7	16	8		
PGRI 6 SMA Banjarmasin	33,5	64,3	24,9	122,7	4,0
Category					Practical

The results of the media practicality test data in trial 1 at SMA PGRI 6 Banjarmasin with a total of 31 student respondents obtained an overall average score from the assessment results through filling out a questionnaire/questionnaire is 4.0 with the media category stated as "Practical". The average score of the overall practicality test results is obtained from adding up the average scores of each student respondent which is then divided by the total number of students. Apart from that, data from the practicality test results in trial 2 at SMA PGRI 1 Banjarmasin obtained the following data:

Table 4. 4 Practicality Test Results (Students' Responses)

Trial 2	Respondent			20 Students	
	Very Practical	Practical	Quite Practical	Amount	Replay
	10	3	7		
PGRI 1 High School Banjarmasin	49,4	12,1	21,5	83,1	4,2
Category					Practical

The results of the media practicality test data in trial 2 at SMA PGRI 1 Banjarmasin obtained an average assessment score of 4.2 in the "Practical" category. This average score is the result of adding up the average scores of each respondent which is then divided by the number of respondents. The number of student respondents in trial 2 was 20 people. Yuanti (2012) in (Ramadanni and Unsil, 2020) stated *mobile learning* is a learning system that uses applications *android* and is unique because students can access materials, directions and applications related to learning anytime and anywhere.

3. Effectiveness Test Results Data

Table 4. 5 Effectiveness Test Results

Trial 1						
Subjects: 31 Students						
Meeting 1						
Respondent	Effective	Quite Effective	Less Effective	Amount	Percent (%)	Category
	13	18	0			
Results	1240	1180	0	2420	78	Effective
Meeting 2						
Respondent	Effective	Quite Effective	Less Effective	Amount	Percent (%)	Category
	14	14	3			
Results	1363	945	150	2458	79	Effective

The results of the media effectiveness test data in trial 1 at SMA PGRI 6 Banjarmasin obtained that the percentage at the first meeting was 78% with the criteria for media effectiveness being effective, while at the second meeting the percentage obtained by researchers was 79% with the criteria being effective. In trial 2 the following results were obtained:

Table 4. 6 Effectiveness Test Results

Trial 2						
Subjects: 20 Students						
Meeting 1						
Respondent	Effective	Quite Effective	Less Effective	Amount	Percent (%)	Category
	13	5	2			
Results	1300	343	80	1723	86	Effective
Meeting 2						
Respondent	Effective	Quite Effective	Less Effective	Amount	Percent (%)	Category
	15	5	0			
Results	1480	334	0	1814	91	Effective

The results of the media effectiveness test in trial 2 at SMA PGRI 1 Banjarmasin obtained a percentage of 86% with effective criteria when the researcher carried out a media effectiveness test at the first meeting, while at the second meeting the researcher obtained a media effectiveness percentage of 91% with effective criteria. Based on this, a conclusion can be drawn that the level of BioSik learning media that researchers have developed is in the "Effective" category when used as a medium to support the learning process in the classroom. The role and benefits of technological development as a learning medium is that it can increase learning motivation and student learning outcomes (Chuang, 2014: 1977) in (Mardiana and Hadromi, 2020).

4. Conclusion

Based on the results of research on the development of BioSik learning media using *power point* for class X high school students it can be concluded as follows:

1. The results of the BioSik media validity test (Fun Biology) involving 5 expert validators are "Valid" and can be used and intended to support the learning process of students in schools.
2. The results of the BioSik (Fun Biology) media practicality test involving teacher and student respondents were "Practical"
3. The results of the BioSik (Fun Biology) media effectiveness test involving class

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