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ABDROID-BASED "PAHINDHAIS" MEDIA DEVELOPMENT FOR FOURTH-GRADE ELEMENTARY SCHOOL STUDENT.

Author

Arya Setya Nugroho[1], Nanang Khoirul Umam[2], Li'izza Diyana Manzila[3]

[1] Program Lecturer PGSD, Universitas Muhammadiyah Gresik
[2] Program Lecturer PGSD, Universitas Muhammadiyah Gresik
[3]PGSD Program Students, Universitas Muhammadiyah Gresik
aryasetya@umg.ac.id[1], nanang.khu@umg.ac.id[2], liizzadiyana99@gmail.com[3]

ABSTRAK

This research was motivated by the lack of media in the online learning process via smartphones. Limited quota and internet networks are also obstacles for students in accessing learning materials, so there need to be android-based media innovation that can be operated offline to support student needs. This research aims to be develop "PAHINDHAIS" android based learning media for fourth grade elementary school students. This type of research is development research using a 4-D model modified by researchers including define, design, and develop. The subject in this study were 4 expert validators consisting of linguist, material experts, graphic experts, and software experts. The data collections techniques and instruments used were validation sheets and student response questionnaires. Based on the results of data analysis, it was found that the development of "PAHINDHAIS" android-based learning media was categorized as very feasible with the result of percentage score of linguist 83,3%, material experts 82,8%, graphic experts 83,6% and software experts 87,5%. Students also gave a positive response to the learning media with a score percentage of 97,6%. The novelty of PAHINDHAIS media is that it can be operated offline, there is a game menu, random system evaluation questions with chat design concept and student answers are automatically sent to the teacher's email

Kata Kunci : 4-D Model, Android-Based Learning Media

A. Introduction

Science and technology (IPTEK) continues to develop both today and In the future, which we cannot avoid, requires people to compete globally so as not to be left behind by technological developments. In a knowledge-based society, the role of science and technology is very important for various fields, including social, economic, geography, education, culture, and other fields (Hartono, 2017). The grouping of technology in education is all that includes audio-visual. (Gunawan, 2004) argues that the field of audio-visual equipment itself consists of two

devices, namely hardware (hardware) and software (software). One of the audio-visual media innovations is a learning application where this application can help students understand the learning material.

Goggin revealed that the penetration of information technology (IT) has made students more technology literate (Hidayat, 2017). Smartphones are closely related to the daily activities of 21st

century students today, considering their use as a means of social media, playing games, watching YouTube, and other entertainment. The increasing use of mobile devices such as smartphones and tablets is becoming an international phenomenon. The most widely used smartphones in Indonesia are Android-based smartphones (Huda et al, 2019). Android smartphones are open source which has advantages such as giving freedom to developers to create various applications.

Educational institutions must use this phenomenon to improve the learning process. Its use is by making smartphone as an effective learning media and can be used by students to learn anywhere and anytime. Especially during the Covid-19 pandemic, the Ministry of Education and Culture established regulations that learning in Indonesia was always carried out with a different system, namely Study From Home (SFH) to break the chain of spread of the Covid-19 virus (Handarini & Wulandari, 2020).

Based on interviews conducted by researchers to the fourth grade teacher of MI Al Mathlabatul Khoiriyah said that the online learning process through the WhatsApp and Zoom applications only raced on thematic books as learning resources and limited media, namely pictures on thematic books. So that during online learning students tend to get bored and do activities outside the learning context. This is because students have difficulty understanding social studies material which tends to require rote memorization. The characteristics of fourth grade students with low reading interest make them less interested in the content of the social studies material being studied. In addition, students also experience obstacles during learning through the Zoom application due to limited internet quotas and internet networks, resulting in students being left behind in understanding the learning material. Student needs for android-based smartphone technology that can be operated offline are very high so that students are always not left behind in obtaining online learning materials. From the results of the interviews, information was also obtained that the fourth grade students of MI Al Mathlabatul Khoiriyah were 100% of students using android smartphones. Some of the android smartphones used by students are smartphone 6 with sufficient specifications to operate an application that is useful for supporting the online learning process.

Learning application development which was developed by the researcher was named "PAHINDHAIS" which stands for the content of the material in this application, namely "Hindu, Buddhist and Islamic Heroes." The PAHINDHAIS application will contain several features, namely learning competencies, learning materials, games, and practice questions. This research is limited to development only. So that it has the aim of knowing the results of the validity and responses of students to the development of the Android-based "PAHINDHAIS"

application for fourth grade students of MI Al Matlabatul Khoiriyah.

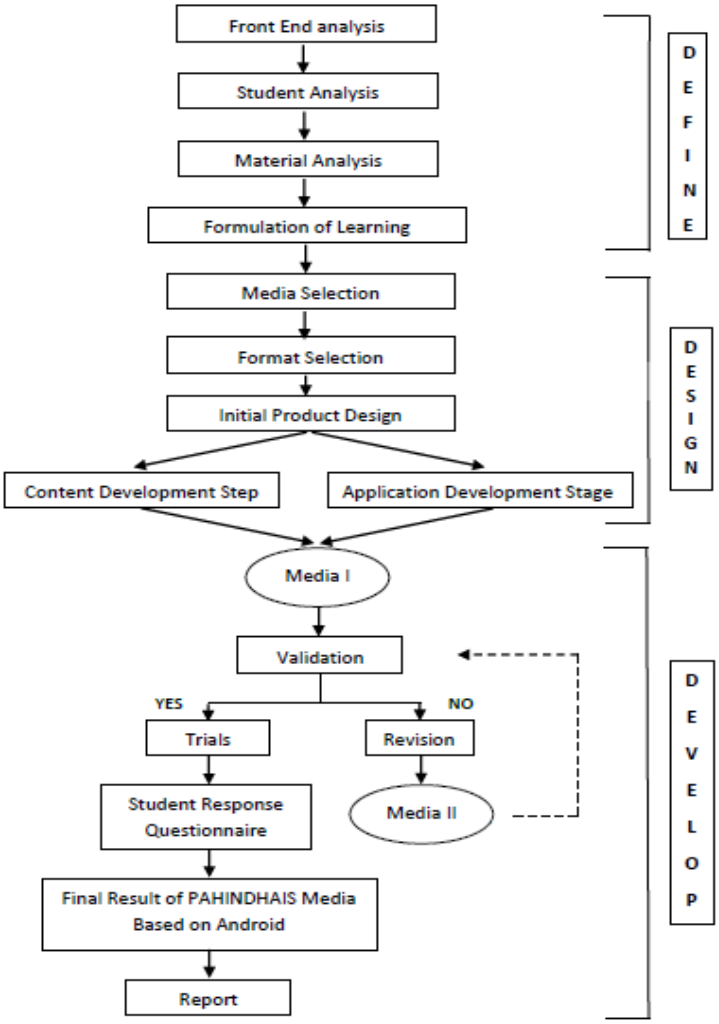

Figure 1. Results of modified 4-D penelitian research procedures

This research was conducted at MI Al Mathlabatul Khoiriyah which is located at Jalan Jambu Raya No. 10 Sukorejo Kebomas-Gresik. This research was conducted in the even semester of the 2020/2021 academic year. The subjects of this research are 4 expert validators. Consists of 1 linguist validator, 1 material expert validator, 1 graphic expert validator, and 1 software expert validator.

The data collection techniques in this study were obtained through the media validation stage and student response questionnaires. So that the instruments used in this study are media validation sheets, and student questionnaire sheets.

The data that has been obtained from the results of the validation sheet is then analyzed in the form of an analysis of the validity of the PAHINDHAIS application media. To calculate the final value, use the following formula:

$$\text{NA} = \frac{\text{total score criteria}}{\text{number of criteria assessed}}$$

Source: Ridwan (2013)

Average score	Category
0 – 20%	Unsuitable
21 – 40%	Suitable Lack
41 – 60%	Suitable Enough
61 – 80%	Suitable
81 – 100%	Very Suitable

Table 1. Validity Criteria

Source: Ridwan (2013)

The analysis of student response questionnaire data was carried out using a scale Guttman who provides two answer choices for each item. Where the answer "yes" = 1 while the answer "no" = 0. Then the average calculation of the results of the analysis is carried out into the formula below:

$$\text{Percentage PD} = \frac{\text{sum of all value "yes"}}{1 \times \text{sum of all students}} \times 100$$

Student responses are categorized as positive if the percentage of student responses has reached 60%. Android-based PAHINDHAIS media is categorized as negative if the student's response is 40%.

1. Research Results

Article I.Linguist Validation Results

Tabel 2. Linguistics expert validation results

No	Rated aspect	Score A	SMK	RK
1.	Straightforward	4	5	80
2.	Dialogic & interactive	4	5	80
3.	Suitability with the development of students	8	10	70
4.	Conformity with language rules	9	10	70
Total score		25	30	300
Percentage		83.3%		
Criteria		Very Suitable		

Article II. Material Expert Validation Results

Tabel 3. Material expert validation results

No	Rated aspect	Score A	SMK	RK
	Learning	9	10	90
	Material	12	15	80
	Curriculum	4	5	90
	Study evaluation	4	5	80
Total Score		29	35	340
Percentage		.8%		
Criteria		Very Suitable		

Article III. Graphic Expert Validation Results

Tabel 3. The results of the validation graphic expert

No	Rated aspect	Score A	SMK	RK
	Design combination	12	15	80
	illustration	4	5	80
	Layout	12	15	80
	Typography	14	15	93.3
	Color composition	4	5	80
otal Score		46	55	413,3
ercentage		83,6%		
riteria		Very Suitable		

Article IV. Software Expert Validation Results

Table 5. Software expert validation results

No	Rated aspect	Score A	SMK	RK
	App size	5	5	100
	Installation	4	5	80
	Accessibility	16	20	80
	Audio effects	4	5	80
	Media updates	5	5	100
Total score		35	40	440
Percentage		87,5%		
Criteria		Very Suitable		

Based on the validation by the four validators related to the four components above, the recapitulation of the final average value of validity is 84.3%. Then the android-based PAHINDHAIS media is included in the validity criteria 81%. Based on these results, the Android-based PAHINDHAIS media has exceeded the established validity standards, and is declared very suitable for use in online learning.

Article V. Student Response Questionnaire Results

The student response questionnaire consists of 9 questions. The following are the results

of the calculation of student response questionnaires:

Table 6. Results of Obtaining Student Response Questionnaires

No	Student's name	Answer options		Information
		Yes	No	
1.	A A	9	0	Positive
2.	FA	9	0	Positive
3.	FAP	9	0	Positive
4.	MS	9	0	Positive
5.	MDS	9	0	Positive
6.	MDA	8	1	Positive
7.	MKPS	9	0	Positive
8.	MK	8	1	Positive
9.	NKA	9	0	Positive
10.	RP	8	1	Positive
11.	SAPR	9	0	Positive
12.	TNS	9	0	Positive
13.	VKPK	9	0	Positive
14.	JK	9	0	Positive
Amount		123	3	Positive

Based on Table 6 the percentage of student response questionnaires is 97.6% which is included in the category 60% so that the PAHINDHAIS media can be said to be positive because it has reached the predetermined category.

2. Discussion

The first stage is *define* or the definition is done by interviewing the fourth grade teacher of MI Al Mathlabatul Khoiriyah. From the results of these interviews, it can be seen that the media used has not provided space for students to actively participate in online learning. Therefore, research and development of android-based PAHINDHAIS media was carried out on the material for the struggle of Hindu, Buddhist and Islamic heroes.

The second stage is the design stage or the design of learning media. In the first stage, namely the selection of media, researchers chose media that were developed by considering the characteristics of students so that the results were in accordance with the expected goals. This is in accordance with the expression (Frey and Sulton, 2010) that if the goals, objectives, and

audience analysis are carried out, the media developed will achieve the desired results. Then at the stage of selecting the media format, the selected media format is android-based media. The Android operating system was chosen because it has an open source concept. According to (Triadi, 2013) open source is that it can be accessed for free so that it provides the opportunity for developers to be free to create applications and operate them on Android smartphones. After that proceed to the stage of making flowcharts and storyboards. (Claudia, 2021) revealed that flowcharts are flowcharts to provide an overview of the application process from one slide to another. Storyboards are made to describe the contents of the application display slides such as images, buttons, and other necessary information (Munir, 2012).

Figure 2. PAHINDHAIS media media menu display

After the PAHINDHAIS media has been created, it enters the third stage, namely: *develop*. At this stage the PAHINDHAIS application was validated by four validators, namely linguists, material experts, graphic experts, and software experts. After validation by the expert, the researcher added suggestions for media improvement according to the opinion of the validator.

The feasibility of PAHINDHAIS media can be known through the results of validation analysis by experts which includes four components, namely language, material, graphics, and software. The assessment aspect category for the language, material, and graphic components is in accordance with the aspect category according to (BSNP). Meanwhile, the category of assessment aspects of the software component is in accordance with the aspect category according to (Wahono, 2006). From the four components, the aspect average is 84.3%. In the conversion table, the value is included in the good category. Based on these results, the android-based PAHINDHAIS media can be used for testing after going through the revision stage.

Practical trials of the learning media developed in terms of student responses after using PAHINDHAIS media in online learning. Participants' responses were obtained by distributing student response questionnaires and then the data from the responses were analyzed. Students assess with a choice of answers "yes" or "no" for each question indicator. After being analyzed, obtained 97.6% of students gave a positive response. So it can be concluded that the android-based PAHINDHAIS learning media is feasible to use in the online learning process.

In general, learning media developed by researchers have several advantages, disadvantages, and novelties, including:

(a) Excess

In terms of design, PAHINDHAIS media is presented in an android-based format which is

very practical and efficient because it can be carried anywhere and operated anytime and anywhere. Mobile learning using smartphones can be done anytime, anywhere, and happens anywhere (Asabere, 2013). In terms of accessibility, PAHINDHAIS media can be operated on all versions of android even at different screen resolutions, even on large screens such as tablets. this is in accordance with the usability goal principle according to (Preece, Rogers & Sharp, 2001) regarding the accessibility of android applications.

In addition, the PAHINDHAIS media can also be used independently by students because of its easy operation without the need for training first, because the PAHINDHAIS application has been adapted to generally standard operating android applications. Research by (Park, 2011) also shows that mobile devices such as android-based learning applications will greatly facilitate students in learning independently.

In terms of learning, PAHINDHAIS media can be applied to online and face-to-face learning with various methods, be it lectures, discussions, and others. In terms of presentation, the PAHINDHAIS application presents a combination of images, animations, and photos that are used as visual support in delivering the material. Visual support tools are used to increase students' attention and apply concepts easily (Syahbiralyani, Hasan, Hamad, Iqbal, 2011).

Article VI. Weakness

In terms of development and manufacture of Android-based PAHINDHAIS media, it requires skills in the IT field as well as adequate specifications and features of computer equipment. In terms of installation, PAHINDHAIS media can only be installed on Android-based smartphones and cannot be downloaded from the Play Store.

Article VII. Novelty

The PAHINDHAIS application design does not only include text and images, but also animations and audio that can attract students' attention. This is a development of learning media that has been previously developed by (Yuntoto, 2015).

The PAHINDHAIS application not only contains a menu of material and evaluation questions but also has a game menu so that students do not get bored when operating the application. The existence of this game menu is a development of learning media that has been previously developed by (Khoiriyah, 2017). The PAHINDHAIS application has provided evaluation questions with a random system so that the evaluation questions cannot be memorized by students. In addition, evaluation questions are designed with the concept of chatting so that students can work on questions like chatting on social media. This is a development of the learning media that has been developed by (Khoiriyah, 2017).

Answers to evaluation questions can be automatically sent to the teacher's email, so the teacher does not have to manually coordinate the results of the remaining evaluations. This is a development of the learning media that has been developed by (Khoiriyah, 2017). The PAHINDHAIS application can be operated offline or online so that students can access learning materials without an internet network. Unless the rest want to work on evaluation questions, the internet network must be turned on so that student answers can be sent to the class teacher's email. This is the development of learning media that has been developed by (Sibilana, 2016).

3. Closing

Based on the research statement and the results of data analysis obtained during research activities, it can be concluded that the android-based PAHINDHAIS media developed by researchers in the language aspect is categorized as "Very Suitable" with validation results reaching 83.3%. From the material aspect, it is categorized as "Very Suitable" with validation results reaching 82.8%. From the graphic aspect, it is categorized as "Very Suitable" with validation results reaching 83.6%. From the material aspect, it is categorized as "Very Suitable" with validation results reaching 87.5%. The PAHINDHAIS media trial was carried out through online learning through the Zoom application by providing student response questionnaires. The response questionnaire was distributed to students and then assessed with a "yes" or "no" choice on each question indicator. Furthermore, it was analyzed and obtained that 97.6% of students gave a positive response.

4. Suggestion

(a) For teachers, the Android-based PAHINDHAIS application product can be developed further, by increasing other materials needed by students so that the resulting product is more comprehensive, because this product only contains material for Hindu, Buddhist and Islamic heroes. In addition, the resulting product can not only be used in the online learning process but can be used in the face-to-face learning process as well.

Article VIII. For further researchers, it is hoped that the Android-based PAHINDHAIS application media can be developed more attractively so that students are more motivated **to learn.**

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