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Development of Android-Based Learning Media and the PIMCA Model at SMP Negeri 7 Halmahera Selatan

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Abstract: This research aims to (1) describe the feasibility of android applications as learning media, (2) describe student reactions in using android applications as learning media, (3) describe the results of student assessments in learning using the PIMCA model. The research methodology used is the ADDIE form development model. The subjects in this study were students of class VIII SMP Negeri 7 Halmahera Selatan. The results of development research are (1). The feasibility of learning media based on Android and the PIMCA model with a percentage for validation of media experts is 88% and material experts are 86%. (2) The reaction or response of students is 82.5% included in the good category. (3) The results of the analysis using the t test show the following values Tcount (26.59) > Ttable α (0.05) 1.73.

Keywords: Media Development, Android and PIMCA Model, ADDIE.

INTRODUCTION

The ideals of the nation by the Indonesian state as stipulated in the Law of the Republic of Indonesia No. 20 of 2003 concerning the National Education System states that education functions developability and form dignified national character and civilization in the context of educating the life of the nation, aiming at developing the potential of students to become human beings who believe and fear God Almighty, have noble character, are knowledgeable, healthy, capable, independent, creative, and become citizens democratic and responsible state. This indicates that education plays a very important role in the development and improvement of human resources to be able to respond to the challenges of globalization which are so rapid. The competition that is happening now is no longer talking about physical strength but rather a combination of intelligence and spirituality. Therefore, education needs to receive intensive attention, intensive handling and priority from the government, the community, the management of education, the teacher and most importantly the family which is the forefront of the students. Along with the developments and dynamics of life that occurred in 2020, many things have changed, these changes are even predicted that in the following years we will still be in the same life, namely being affected due to the Covid-19 outbreak that has penetrated Indonesian society, based on the this, then raises a question in our minds that, whether the ideals of the nation contained in RI Law No. 20 of 2003 can it be achieved during the Covid-19 outbreak like this?. Logically, this outbreak makes all forms of activity not run normally, because of health regulations from WHO and the Government not to leave the house or limit activities outside the home, thus learning is not effective if it is only carried out without modifying learning. Of course, this indicates that in order to achieve the ideals of the nation as stipulated in RI Law No. 20 of 2003, requires us as teachers to continue to be innovative. According

to Paat et al. (2021) the Covid-19 pandemic has also disrupted life around the world. This disorder impacts the entire life of the individual including education. Education has developed in learning innovation during the Covid-19 pandemic, where online learning alternatives have been implemented in schools ranging from kindergartens to universities. One example of renewal by utilizing technological developments in the field of education is multimedia learning.

Responding to life like this, the learning system must be modified. It is true that the learning process in schools has a strategic role in transferring or conveying knowledge to students. But in these circumstances the process of conveying knowledge is not only conventional, it needs a media, so that there is media that contains information and ideas that can facilitate student learning, namely learning resources (Sitepu, 2008). Most students think that their source of receiving information/knowledge only comes from books or from the teacher, this perception must be addressed or it is necessary to give correct understanding to students regarding sources of knowledge. Sources of learning or knowledge are not only obtained from teachers and theoretical books, but learning resources can be obtained from the surrounding environment, for example in the school environment as well as the media. This is in line with the opinion of Brahim (2007) which states that the existence of the natural surroundings is a potential that can be utilized to support students' activities in the learning process. The development of learning that is being carried out at this time should keep up with the times in facing the New Normal Era and be supported by the industrial era 4.0, namely by utilizing technology as an effective alternative for the development of Indonesian education in the Pandemic era. This is in line with the opinion of Brahim (2007) which states that the existence of the natural surroundings is a potential that can be utilized to support students' activities in the learning process. The development of learning that is being carried out at this time should keep up with the times in facing the New Normal Era and be supported by the industrial era 4.0, namely by utilizing technology as an effective alternative for the development of Indonesian education in the Pandemic era. This is in line with the opinion of Brahim (2007) which states that the existence of the natural surroundings is a potential that can be utilized to support students' activities in the learning process. The development of learning that is being carried out at this time should keep up with the times in facing the New Normal Era and be supported by the industrial era 4.0, namely by utilizing technology as an effective alternative for the development of Indonesian education in the Pandemic era.

Information and Communication Technology (ICT) has become an important requirement in determining the quality and effectiveness of the learning process (Martiningsih 2017). The use of ICT helps the learning process become more meaningful because it helps students understand the concept of the material being taught. The role of ICT in the learning process is to provide learning resources that can make it easier to provide information and accelerate student work. Utilization of ICT-based learning resources for students can occur anytime and anywhere, meaning it is not limited by space and time. The process of presenting learning material and conveying ideas can be more interesting and fun so that in the end a competency standard is achieved which is the learning goal. The development of Information and Communication Technology in the present century is very rapid, this has affected various aspects of life, and is no longer a stranger to society. In the present, ICT plays an important role, both in the fields of Education, Economy, Social, Culture, Religion and others. For example, currently many smartphone users use various Android applications to share information, for example through video conferencing. This indicates how important technology is in difficult pandemic times like this, not even just during a pandemic. In the world of education, ICT changes the way students learn to get the necessary information that supports the learning process.

Learning Science Education is expected to be a vehicle for students to learn and explore the natural surroundings, as well as prospects for further development to apply in everyday life. But the

fact is that in science learning, students only study the products that have been provided and receive and memorize the information that has been provided without considering other references, this results in students being unable to apply the knowledge they have acquired in real life (Depdiknas, 2007). One of the goals of learning science in junior high school is to increase awareness about science which can be beneficial as well as harmful to the environment. Science also aims to understand concepts, principles, laws, and science theory and its application to be able to solve problems that exist in society, especially those related to science and technology (Depdiknas, 2007). Science learning can be achieved if in the learning process the teacher is not only a facilitator/main role who is the center of attention in class, because the learning process can be carried out using various learning resources including the use of Information Technology (IT), namely facilities consisting of hardware and software capable of supporting and improving the quality of information for students quickly and with quality.

*Mobile learning*become one of the solutions or learning resources for developing the science learning process which is still dominated by the role of the teacher/teacher center. Mobile learning with a variety of natural science materials packaged and designed with a variety of audio, image, animation and color media will be very effective and fun, and of course students will understand the content of the material presented more quickly. The development of mobile learning-based learning media using software assistance provides an interesting learning model. Development in utilizing this software is expected to be a new breakthrough in improving the quality of education, especially the quality of science learning.

Today, the use of smartphones among students has experienced rapid development. Most students have used and utilized smartphones as a lifestyle. The results of interviews with parents of students and a science teacher at SMP Negeri 7 Halmahera Selatan, said that "the school is currently providing smartphones for online learning purposes during the pandemic, we are very grateful because there are facilities that can support the online learning process during the pandemic However, what happens is that most students tend to use the facilities provided by the school to listen to music/videos, access social networks (Facebook, Youtube) and even play games. This is very unfortunate, the facilities that should be used for study purposes are used for other things. Then the science teacher also said "during the learning process during the pandemic we as teachers only used Zoom, but there were network factors that were not supportive. So this becomes a struggle for us as educators. To answer this question, learning.

The PIMCA model at SMP Negeri 7 Halmahera Selatan*".*

RESEARCH METHODS

In this research, the type of research used is Research and Development (R&D). Research and development is a research method used to produce certain products, and test the effectiveness of these products. In the field of education, this method can be used to develop books, modules, learning media, evaluation instruments, curriculum models, and others. This type of research is different from other educational research because the goal is to develop a product based on trials and then revise it until it produces a product that is usable.

The development model used in this research is the ADDIE model (Analysis, Design, Development, Implementation, and Evaluation). The steps in developing the ADDIE model are as follows:

3.1 ADDIE Development Chart

Development Procedure

1. *Analysis*(Analysis)

The first stage is an analysis to find out the initial needs in developing this learning media. Among them regarding the analysis of the characteristics of students and media analysis. This analysis stage is the stage of seeking information in the field, which can be used as a reason for the need to develop a media.

2. *Design*(Design)

The second stage is the stage of making the media design that will be developed. In this second stage the researcher makes a design or product design from the results of the analysis in the previous stage. The product made is an Android-based learning media.

Formulate the objectives to be achieved: it is expected to produce an android application as a science learning medium to further improve the learning outcomes of class VIII students of SMP Negeri 7 Halsel.

a. Determine the standard of achievement and the type of instrument to be used: the standard of achievement of Android-based learning media and the implementation of the developed PIMCA model, namely if the media to be made meets the eligibility qualification standards based on the validation of material experts and media experts. The instrument for testing the achievement of the media made was the opinion of the expert on learning materials and learning media, while the instruments used to obtain student scores were the results of tests given before learning (preliminary test) and after learning (final test).

b. Designing initial media development activities and field tests carried out include:

1) Gather references.

2) Determine the research subject.

3) Prepare instruments for evaluation. The instrument used in the media evaluation stage after the field trial was carried out was the student learning achievement test.

3. *Development*(Product Development and Manufacture)

This stage is the process of making learning media. At this stage, the researcher continues to make media based on the storyboards and flowcharts that have been made. Media that has been

made, then tested the application.

a) Material and Media Validation

In this stage, the researcher validates the material expert and media expert validation using a questionnaire to assess the media being developed. The subject of the assessment is someone who is experienced in the field of materials and media.

b) Small Group Trial

This stage carried out a limited scale trial using a questionnaire to assess the media used. The field trial subjects were 9 class VIII students at SMP Negeri 7 Halsel.

4. *Implementation*(Implementation)

Learning media that have been developed and declared feasible have been tested

by media expert lecturers and material expert lecturers, then implemented to students. Then the students filled out a media evaluation questionnaire. The next stage is a field test applying the use of media to research subjects with the One Group Pretest-Postest Design.

Pre Test	*treatment*	*Posttest*
T1	X	T2

Table 3.7. The schematic of the one group pretest-posttest research design

Information :

T1: Initial test (Pre Test) was carried out before being given treatment

X: Treatment is given to students using android learning media and the PIMCA model

T2: The final test (Post Test) is carried out after being given treatment

The independent variable in this study is learning to use media and the PIMCA model and the dependent variable in this study is the learning outcomes of class VIII students at SMP Negeri 7 South Halmahera.

5. *Evaluation*(Evaluation)

This evaluation stage is the final stage of developing the learning media that is being carried out. At this stage the researcher made a final revision of the learning media that was developed. In addition, at the evaluation stage, the researcher gave a questionnaire to the students which was used as a measuring tool to assess the success of making learning media and based on the suggestions and input provided by the students so that the researcher could make revisions so that the learning media that was developed was truly appropriate and feasible to use. .

Data Collection Instruments

The research instrument is a tool used to measure observed natural and social phenomena. Research instruments can also be defined as equipment used to obtain, manage, and interpret information from respondents using the same measurement pattern.

Data collection techniques are the application of instruments in the field in the context of screening or for obtaining research data, sources of equipment to support the accuracy of information in the development of learning media and the implementation of the PIMCA model. Data collection techniques used in this study were expert validation sheets and student questionnaires.

a) Validation sheet

The validation sheet is a sheet to make it easier for the validator to provide assessments and suggestions for the instruments made by the researcher. In this study, validation sheets were made for material experts and media experts. The results of the validation will help researchers to revise

the instrument so that it is feasible to use.

Instrument validity is the degree that indicates where a test measures what it is intended to measure (Sahih). The instrument validity test aims to determine the cohesiveness of the statement items that will be used in learning media, whether the instrument used can measure according to what is being measured. The validation in this study is based on two things, namely based on a prepared grid and based on expert opinion. The way to get instrument validation is by compiling a grid as a reference in preparing the instrument. The instrument validation includes two components, namely:

1) Instrument Validation for Material Experts

Material validation was carried out by one of the UNIMA Science Education Study Program lecturers. The purpose of material expert validation is to obtain data used to revise learning media products about respiratory system material.

2) Instrument Validation for Media Experts

Media validation was carried out by a lecturer at the UNIMA Science Education Study Program. This media expert validation aims to carry out a feasibility test of learning media seen from the appearance and program aspects. Validation was carried out using a validation sheet in the form of statements, media experts providing suggestions and comments, as well as recommendations for improvement.

b) Questionnaire

A questionnaire or questionnaire is a tool for collecting research data in the form of a list of questions submitted to respondents to be answered in writing. The questionnaire was used to find out students' responses regarding the development of this learning media and to find out the feasibility of the product as a basis for revising the product. The research instrument uses a Likert scale, namely by giving a score of 1 (strongly disagree), 2 (disagree), 3 (enough), 4 (agree), 5 (strongly agree). The quality of media elements, materials, and information can be known after calculating the percentage.

c) Test

The tests used are pre-test and post-test. The aim is to determine student achievement in the material before and after learning.

1) Conducting a pretest in the experimental class, to collect data on student learning outcomes before being given treatment or applying the PIMCA model.

2) Carry out the process of using learning media as a form of treatment using the PIMCA model.

Conducting a posttest to collect data on the results of the assessment after being given treatment using the PIMCA model.

Data analysis technique

After all the activities carried out are completed, then the next process is analyzing the data. Data analysis is an activity after data from all respondents or other data sources are collected. There are two objectives of data analysis, namely summarizing and describing data. Activities in data analysis are grouping data based on variables and types of respondents, presenting data for each variable studied, performing calculations to answer the problem formulation, and performing calculations to test the hypotheses that have been proposed. For research that does not formulate a hypothesis, the last step is not carried out.

a) Validation Sheet Analysis

The type of data collected in this study is in the form of qualitative data which is converted into quantitative. The data analysis used in this research is descriptive analysis with the following steps:

1) Convert the qualitative values obtained from the validator into quantitative form, with the provisions in Table 3.4.

Table 3.3. Scoring Rules

Category	Score
SK (Very Less)	1
K (Less)	2
C (Enough)	3
B (Good)	4
SB (Very Good)	5

(Umar, 2003)

2) Calculate the average score of all assessment indicators for learning media using the formula:

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

Information:

X = Average score of indicator X ΣX = Total score of indicators N = Number of indicators

(Djaali and Pudji Muljono, 2009)

2) Changing the average score of indicators in the form of quantitative data into qualitative categories. How to change the average score into a qualitative category, namely by comparing the average score with the ideal assessment criteria of indicators with a scale score conversion of 5.

3) Determine the percentage of android-based learning media with the following formula:

$$Persentase\ keidealan = \frac{SKOR\ RATA - RATA}{SKOR\ TERTINGGI} \times 100\%$$

1) Compare the results of the percentage of expert validation sheets with the criteria for the percentage of expert validation sheets which can be seen in Table 3.5 below:

Table 3.4. Expert Team Validation Criteria

Percentage	Number	Information
81-100%	4	Very Valid
61-80%	3	Valid
41-60%	2	Invalid
40%	1	Totally Invalid

(Umar, 2003)

b) Questionnaire Analysis

To analyze the data from the questionnaire, the following steps were taken:

1) Convert the qualitative values obtained from the validator into quantitative form, with the provisions in Table 3.4

b. Calculating the average score of all assessment indicators for android-based learning

media using the formula:

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

Information:

X = The average score of the indicator ΣX = The total score of the indicator N = Number of indicators

(Djaali and Pudji Muljono, 2009)

c. Changing the average score of indicators in the form of quantitative data into qualitative categories.

How to change the average score into a qualitative category, namely by comparing the average score with the ideal assessment criteria of indicators with a scale score conversion of 5.

d. Determine the percentage of learning media with the following formula:

$$\frac{Persentase\ keidealan}{SKOR\ RATA - RATA}$$

0.400-0.600	Slightly Low
0.200-0.400	Low
0.000-0.200	Very low

d)Test data analysis

Results evaluation test class Which using media. Determination there is an increase =

$$\frac{}{SKOR\ TERTINGGI} \times 100\%$$

or no significant increase in

e. Comparing the results of the percentage of student responses with the criteria for the percentage of student responses which can be seen in Table 3.5 below:

Table 3.5. Student Response Percentage Criteria

No	Percentage	Category
1	36%	Very less
2	37-52%	Not enough
3	53-68%	Enough
4	69-84%	Good
5	85-100%	Very good

(Arikuntoro, 2006)

c) Test device analysis

This data analysis is in the form of questions used before and after the learning process.

1) Validity test

Validity test was carried out on each item using Microsoft Excel 2010. Results

learning outcomes using the t test.

The t test will be used if the treatment groups are normally distributed using the test:

1) Normality test: used in this study is the liliefors test with α = 0.05 and assisted by the Microsoft Excel 2010 program, the goal is to test class groups whether or not the data distribution is normally distributed.

2) Hypothesis Test (One Group Pre-Test Post-Test): is a comparative test of one independent variable with α = 0.05 using the t-test statistical formula according to Arikunto (2006:279):

$$t = \frac{Md}{R_{count}}$$

compared to r

table

where df=n-1

$$\frac{\sqrt{\sum x2d}}{N(N-1)}$$

with sig 5%. If rtable<rcount then valid.

2) Reliability Test

The reliability test was carried out using Microsoft Excel 2007 with the Alpha Cronbach formula:

Information :

Md : The mean/average of the difference between pretest and *posttest*

Xd : Deviation of each subject (d-Md)

∑ Ξ X2d: Sum of squared deviations

Information :

$$rac = (k-1)\left[1 - \frac{k}{\sigma}\right]$$

t

$\square\square_b 2$

2]

N : Subjects on sample

RESEARCH RESULT

rac : Alpha cronbach k reliability coefficient : Lots of question items
□□ 2 : Total number variance per item/itemquestion
□ 2 : The amount or total variance

After the reliability coefficient is known, it is then interpreted using the categories according to Arikunto, 2006: 276, which are as follows:

Table 3.6. Reliability feasibility criteria

The value of r	Interpretation
0.800-1.00	Tall
0.600-0.800	Enough

1. Produced Products

Visualization of developed media products is shown in the following figure:

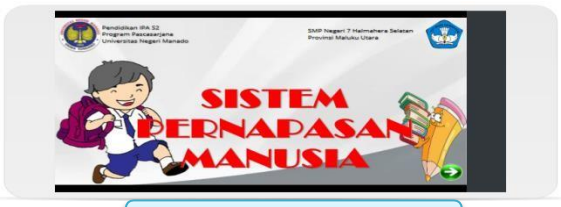

Figure 4. 1 Main Page

The main page will appear the title of the learning media.

Figure 4. 3 Menu Pages

The login page (Login) will appear in the Name and Class Columns.

The main menu will display various options, namely: Curriculum, materials, Glossary, Videos, Instructions, Info, Stages of the PIMCA Model and Evaluation.

Figure 4. 4 Curriculum

On the Curriculum Page, KD and Learning Objectives will be displayed.

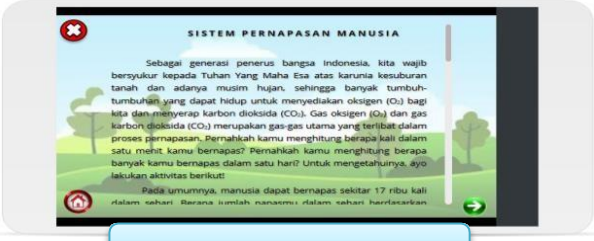

Figure 4. 5 Material Pages

On the Material Page, material about the human respiratory system will be presented.

Figure 4. 6 PIMCA Model Pages

This page contains the PIMCA Model Stages.

Figure 4. 7 Video Pages

The Video page displays the PIMCA Model-based Learning Videos.

Figure 4. 8 Glossary

The Glossary page will display various scientific terms that exist in the material of the human respiratory system

The Profile page displays the developer's curriculum vitae and the developer's social media, namely Facebook, Instagram, Whatsapp and
YouTube.

Figure 4. 9 Profiles

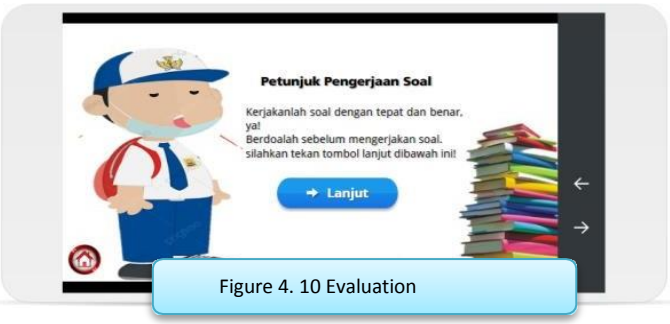

Figure 4. 10 Evaluation

On the main page on the Evaluation page displays instructions for working on questions and then instructs to be able to do the questions that have been provided

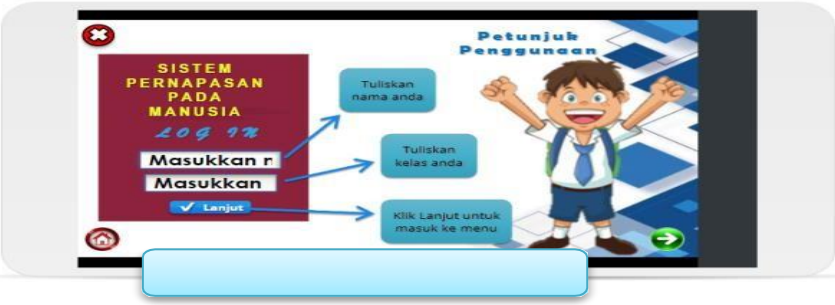

Figure 4. 11 Instructions

The Instructions page will display various instructions for using Android-based learning media.

2. Learning Material Validation

Validators material learning evaluate as shown in the table below:

4	The material matches that formulated in KD	5
5	Material according to level student ability	5
6	Clarity of description/sequence of material respiratory system	4
7	The scope of material relates to the sub-themes discussed in respiratory system	4
8	Related clear and specific material respiratory system	4
9	The images used are appropriate with the respiratory system	4
10	The examples given are appropriate with local wisdom.	4
	Total Score Total	43
	Total Maximum Score	50
	Minimum Total Score	10
	Average	4
	Percentage %	86 %
	Criteria	**Very Good/decent**

Based on the calculations (Appendix 1), a percentage of 86% is obtained, this percentage is included in the very feasible criteria.

3. Learning Media Validation

The learning media validator evaluates as shown in the table below:

Table 4.2 Media Validation Assessment

No	RATED ASPECT	VALIDATOR
	A Aspects of Program Ease	
1	Ease of opening and programs	4
2	Ease of selecting menus gation)	4
3	Material organization	5
	B. Aspects of Visual Communication	
1	Writing color composition	5
2	Writing composition	4
3	Layout suitability	4
4	Image quality	4
5	Animation quality	4
6	Video quality	4
7	The images presented are related and supportive ial clarity	5
8	Consistent presentation of images in text	5
9	Interaction (giving stimulus esponse)	4
	C. Linguistic Aspect	
1	Text readability	5
2	Compliance with good Indonesian rules ght	5
3	Language use ive and efficient	4
	Total score achieved	66
	Maximum total score	75
	Percentage value %	88%

No	Statement	Mark TB	KB	CB	B	SB
Aspect Material and Display Program						
1	Materialpresented already complete	0	0	0	1	8
2	Writing composition interesting	0	0	0	2	7
3	Interesting video presentation	0	0	0	2	7
4	Audio sounds clear	0	0	0	1	8
5	Video quality	0	0	0	0	9
6	Picturepresented is related and supports clarity material	0	0	0	0	9
7	Writingclear and easy be read	0	0	0	0	9
Aspect Program Benefits						
8	Rejuvenate h student learning	0	0	0	2	7
9	Ease of understanding the material served	0	0	0	2	7
10	Materialaccording to the level of ability student	0	0	0	4	5
Total score achieved		0	0	0	14	76
	Total score maximum			90		
Percentage value		0	0	0	15.55	83.33

Based on the calculations (Appendix 2), a percentage of 88% is obtained, this percentage is included in the feasible criteria.

1. Field Trial (Limited Scale)

Based on the data obtained as shown in the table below:

Table 4.3 Assessment of Limited Scale Trials

Based on these calculations, the percentage of the 10 score indicators achieved for good criteria is 84.44%, for good criteria is 15.55%, for other criteria each is 0%, therefore students give very good reactions to Android-based learning media given and there are no changes to be revised at a later stage, then the trial can proceed to the field test stage.

4. Field Test

Furthermore, the field test was carried out in class VIII as many as 19 respondents were given treatment (using android-based learning media and applying the PIMCA model). The results of this field test obtained data on learning outcomes through the Pre Test and Post test, but validity and reliability tests have been carried out beforehand (Appendix 5 & Appendix 6). Pre Test scores (preliminary test) are obtained before learning begins, and Post test (final test) is generated

after learning by giving treatment to students and test reactions to the media given. Data on learning outcomes through written tests on 19 students obtained the highest score of 90 while the lowest was 80.

Based on student response data in using Android-based learning media, the number of very good criteria (SB) = 85.78%, Good criteria (B) = 6.8%, Fairly good criteria (CB) = 5.2%, Poor criteria good (KB) = 2.1% and not good criteria (TB) = 0%. The percentage of 85.78% is included in the valid criteria and is included in the very good category (Appendix 4).

5. Results of Data Analysis

a) Normality test

Test the normality of the difference between the pretest-posttest treatment class using the Lilliefors test. Obtained Lcount = 0.16 while in the calculation using the formula Ltable = 0.19. This means Lcount < Ltable or 0.16 < 0.19. So that H0 is accepted and it can be concluded that the data is normally distributed.

a) Hypothesis Test

Hypothesis testing is calculated using the help of Microsoft Excel 2016 software. Based on the calculation, the tcount is 26.59 and the ttable is 1.73, then H0 is rejected and H1 is accepted. With the following test criteria:

tcount > ttable then H1 is accepted and H0 is rejected. tcount < ttable then H0 is accepted and H1 is rejected.

Real Level = 0.05.

DISCUSSION

This study aims to describe the feasibility of the PIMCA model-based android application media on the respiratory system material, describe the reactions of students in learning using the android application-based learning media and the PIMCA model on the respiratory system material, describe the increase in learning outcomes in the use of android application-based media and the PIMCA model on the respiratory system. Prior to conducting research, researchers first prepare teaching materials and media to be developed and to be used.

Making this learning media uses the help of Storyline 3 Software and Website 2 APK Builder Pro. First

The developer makes a media creation chart using the Storyline 3 Software, in Storyline 3 there are various menus, elements that make it easier for developers to be creative so as to produce media that can help students in learning. After the process of creating learning media in Storyline 3 has been completed, the next step is to publish in Html5 form and the publish tool bar has been provided in Storyline 3, but to publish learning media you need an internet connection. The next step is to convert the publisher results to Software Website 2 APK Builder Pro to be able to produce an Android application-based learning media.

The media used is a media developed by researchers, namely Android-based media. The learning media was tested for its feasibility by experts from both the material and media aspects, and got the results of the feasible criteria. It is said that the material and media are feasible because the required assessment is in accordance with the curriculum, standard assessment indicators and meets the criteria and is in accordance with the elements of the content contained in the Android application based on the PIMCA model.

Based on the results of the expert's assessment and meeting the criteria for media that were suitable for use, the research was carried out, but first the developed media was tested in a small group (limited trial) at SMP Negeri 7 Halsel consisting of 9 respondents, this aims to find out the response or reaction of students to the media developed by researchers and the results get good reactions from students. Getting a good criterion because the media used is in accordance with the standard testing criteria, the media used is interesting, and triggers the interest of students to play an active role in the learning process, this is also in line with the PIMCA model where the presentation of material sources is one of the measures of success learning, Another supporting factor is that today's students prefer learning from YouTube or things that are integrated with media/digitization. The use of Android-based learning media does not only focus on media, but with the help of media students encourage each other to grow together. In this process the media is used as a source of information for students so that misconceptions do not occur, but the teacher's role does not stop but continues to provide encouragement or direction to students who do not understand the material being studied.

The results of the reaction of students on a limited scale get the appropriate criteria, so this research is continued at the next stage, namely field testing and getting good category results, it is concluded that the Android application media based on the PIMCA model on the developed human respiratory system material gives a positive reaction or response from learners. The good category that students give is of course because the media displayed is very interesting, clear, colorful so it's not boring, it motivates them to ask questions, answer, and play an active role in the learning process because it creates student learning interactions, the adequacy of material descriptions in explaining concepts, as well as the completeness of the material .

This research is in line with research conducted by Sondakh et al (2021) The feasibility level of Android-based interactive learning media is based on assessments: (1) material expert validation obtained an average of 4.36 including the Very Eligible category (2) media expert validation for the first indicator obtained the average is 4.66 including the Very Eligible category, while the second indicator obtained an average of 4.55 including the Very Eligible category (3) validation for science learning practitioners obtained an average of 4.00 including the "Enough" category. This interactive learning media received a positive response from students with the percentage for all indicators reaching 100%. Assuming that the media created is very helpful in learning. Muttaqin et al. (2021). The results of data analysis on Android-based interactive learning media obtained a validation score by material experts with an average score of 4.8 out of a maximum score of 5 in the "Very Good"

category, then media experts obtained an average score of 4.8 out of a maximum score of 5 in the "Very Good" category. Very good". Furthermore, the score in the small group trial obtained an average score of 4.5 from a maximum score of 5 which was in the "Very Good" category. Thus the validation results from material experts, media experts, and small group trials state that the product of developing Android-based learning media is valid and practical. Furthermore, the score in the small group trial obtained an average score of 4.5 from a maximum score of 5 which was in the "Very Good" category. Thus the validation results from material experts, media experts, and small group trials state that the product of developing Android-based learning media is valid and practical. Furthermore, the score in the small group trial obtained an average score of 4.5 from a maximum score of 5 which was in the "Very Good" category. Thus the validation results from material experts, media experts, and small group trials state that the product of developing Android-based learning media is valid and practical.

The research results of Resti Yektyastuti, 2016, show that the learning media developed are considered suitable for use in learning in terms of assessing material aspects and media aspects; as well as the use of developed learning media has an influence on improving the academic performance of high school students. Likewise research conducted by Riska Susila Putri. 2019. Shows the research results were obtained from material experts, media experts, and teacher responses with successive percentages of 80%, 91.6% and 94% very valid categories. The results of the implementation of the students by giving a questionnaire obtained a percentage of 91.6% in the very good category.

Research was also conducted by Poluakan Mondolang and Mongan. (2020) regarding students' difficulties in learning vectors and their application in physics. For this reason, research has been conducted which aims to identify misconceptions about vectors and their application in conceptual physics and the use of line graphs in teaching physics. Therefore research has been conducted based on the use of representation. The research method uses MOMBI which emphasizes the treatment of class formative assessment models. The results of the study stated that the use of line graphs in vector learning has positively increased the ability of understanding related to vector concepts and their application in physics concepts. Recommendations from the research results are the importance of teaching materials and university physics reference books, include graphic lines on concept images used by vectors, such as vectors of force, momentum, torque and so on. Likewise, research conducted by Naram & Poluakan (2021) regarding the multiple representation-based Science Technology Society (STS) learning model for science learning outcomes for Tongke Christian Middle School students in the era of the co-19 pandemic. Based on the data analyzed, it was obtained a sig value of 0.001 <0.05, so Ha was accepted and H0 was rejected. So it can be concluded that there is an influence of the STS learning model based on multiple representation on the science learning outcomes of Tongke Christian Middle School students in the era of the co-19 pandemic. Poluakan (2021) regarding the Science Technology Society (STS) learning model based on multiple representation of the science learning outcomes of Tongke Christian Middle School students in the era of the co-19 pandemic. Based on the data analyzed, it was obtained a sig value of 0.001 <0.05, so Ha was accepted and H0 was rejected. So it can be concluded that there is an influence of the STS learning model based on multiple representation on the science learning outcomes of Tongke Christian Middle School students in the era of the co-19 pandemic. Poluakan (2021) regarding the Science Technology Society (STS) learning model based on multiple representation of the science learning outcomes of Tongke Christian Middle School students in the era of the co-19 pandemic. Based on the data analyzed, it was obtained a sig value of 0.001 <0.05, so Ha was accepted and H0 was rejected. So it can be concluded that there is an influence of the STS learning model based on multiple representation on the science learning outcomes of Tongke Christian Middle School

students in the era of the co-19 pandemic.

During the field test process, the researcher not only looked at student responses but also student learning outcomes in 19 respondents in class VIII and got learning outcomes above the KKM, this means that students are complete. Judging from the average student acquisition, which is 83.68 and also the results of calculations from the hypothesis, it shows that there is an influence so that this research is declared successful.

Based on some of the results of these studies, it can be seen that the development of an android application media based on the PIMCA model on human respiratory system material for class VIII students at SMP Negeri 7 Halsel is feasible to use and get very good reactions or responses by students and get high learning outcomes. This is also because the questions used have been tested for validity and reliability beforehand, and the material is described systematically, students are active during the learning process, because the material is presented in the form of an android application based on the PIMCA model which they can see clearly and become a resource. information in social interaction in the learning process,

CONCLUSION

Based on the results of the analysis and discussion carried out, it can be concluded as follows:

1.The feasibility of android-based learning media and the PIMCA Model on human respiratory system material for class VIII students of SMP Negeri 7 Halsel after being tested for validation by Material Experts obtained a percentage of

86%, this percentage is included in the very feasible criteria. Likewise with Media Expert Validation getting a percentage of 88%, this percentage is included in the appropriate criteria.

2.The reactions or responses of students after using learning media based on Android and the PIMCA model on the human respiratory system material for class VIII students of SMP Negeri 7 Halsel are included in the good category. Based on student response data in using Android-based learning media, the number of very good criteria (SB) = 85.78%, Good criteria (B) = 6.8%, Fairly good criteria (CB) = 5.2%, Poor criteria good (KB) = 2.1

% and not good criteria (TB) = 0%.

The percentage of 85.78% is included in the valid criteria and is included in the very good category

3.The learning process using the android application and the PIMCA model on human respiratory system material for class VIII students of SMP Negeri 7 Halsel can improve student learning outcomes, with computation, namely the tcount is 26.59 and the ttable is 1.73, then H0 is rejected and H1 is accepted , which means it can improve student learning outcomes.

SUGGESTION

1. In the use of learning media, this can be a guideline or reference for many teachers to be further developed for the better.
2. Presumably this media can be made for other materials.

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