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Design and Development Based Learning Media Application Using Mobile App Inventor

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Abstract. This research and development aims to produce a product in the form of mobile application-based learning media for class X Vocational High School students. This type of research is research and development using a 4-D development model. The instrument used in this study was in the form of a questionnaire distributed to teachers and students as well as experts to test the validator. Based on the analysis, it was obtained that the validator test for this mobile application-based learning media was 90.33%, with a very valid interpretation of the validity level of use. The results of the overall practicality assessment from the practicality test were assessed at 86.77%, so that the level of practicality can be interpreted as very practical to use. The results of the overall assessment of the effectiveness test for the assessment of the effectiveness of 87.29% Reviews its effectiveness so that it can be interpreted very Effectively used. Thus, this learning media is very valid to be used, very practical to use and very effectively used in learning in vocational high schools.

Keywords: Learning Media, Mobile App Inventor

INTRODUCTION

Learning media is a tool or intermediary that is useful to facilitate the learning process, in order to facilitate communication between teachers and students. This is very helpful for teachers to teach and facilitate students to receive and understand lessons. According to Arief S. Sadiman (2003:6) media is anything that can be used to convey messages from the sender to the recipient so that it can stimulate thoughts, feelings, concerns and interests. and students' attention in such a way that learning occurs. Arsyad, A. (2011) also said that the media is an intermediary or messenger from the sender to the recipient of the message, in this case of course between teachers and students. The use of learning media in the teaching and learning process can also generate new passion and interest for students, motivation to learn, and even bring psychological impact on students. Abi Hamid, M., Ramadhani, R., Masrul, M., Juliana, J., Safitri, M., Munsarif, M., ... & Simarmata, J. (2020) stated that one of the learning components is media. (tools) of learning, synchronization between learning components will create a well-executed learning process and the achievement of learning objectives. Susilana, R., & Riyana, C. (2008) said that the media is part of the communication process, and learning is a communication process between teachers and students. Learning media can be in the form of print, non-print and can be in the form of software. With today's conditions that everything is online, teachers are required to be more creative in producing a learning media that suits the needs and interests of students. Efendi, Y. (2018) also uses APP inventors in producing learning media for the purpose of spurring student creativity. Negara, H. R. P., Syaharuddin, S., Kurniawati, K. R. A., Mandailina, V., & Santosa, F. H. (2019) stated that learning media using the app inventor application

can increase students' learning independence and learning motivation. Sefriani, R., & Veri, J. (2018) in their research revealed that mobile learning in digital simulation lessons can improve student learning activities. Sefriani, R., Wijaya, I., & Radyuli, P. (2018) also mentions in his research that android-based learning in vocational high schools developed in the form of learning media by utilizing smartphones can be used as a learning resource. Wijaya, I. I., Sefriani, R. R., & Wagimon, W. (2020) also developed interactive learning media with the aim of increasing students' competencies. Sefriani, R., & Veri, J. (2021) also strive to develop interactive learning media by utilizing Macrodenia Director MX software with the aim of increasing student learning activities and independence. Radyuli, P., Sefriani, R., & Nurhidayati, N. (2019) produced an app inventor-based learning media product with a very suitable category for use in learning. Wijaya, I., & Sefriani, R. (2021, March) in their research stated that the learning media he developed based on Android smartphones was very feasible to be used by educators and students in the hope of learning independence in understanding learning material. conducted by Alkodri, MN (2019. To support making applications Wolber, D., Abelson, H., Spertus, E., & Looney, L. (2011) stated that app inventors exist to facilitate people in developing and creating applications as needed and desire. Kloss, JH (2012) in his writings mentions that the app inventor is very easy and fast in making an application related to user needs. Irma, ZU (2017) have also produced a product in the form of learning media using the app inventor and also used by educators and students so as to increase student learning activities.Thus designing and developing developing learning media products using the app inventor application is very appropriate to do to support the learning process.

METHOD

This type of research is to use research and development or also known as Research and Development (R&D), which is the type of research used to produce certain products (Sugiyono: 2014). To develop this research using a 4-D development model, which consists of define, design, develop and dessiminate. The following is the implementation of the 4-D development steps for the developed product.
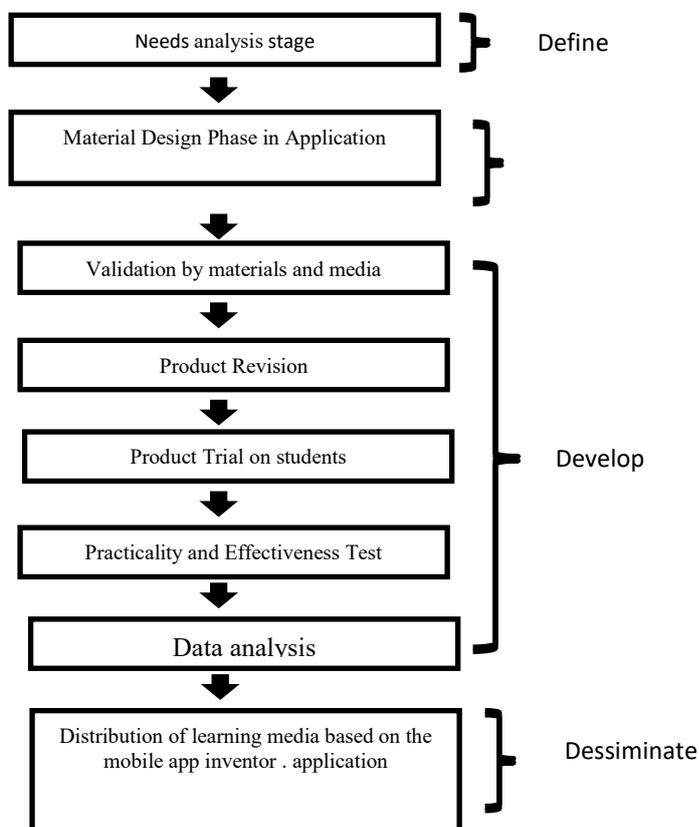
Figure 1. receipts Research Procedure Development Model 4-D

The validity of the instruments used to determine whether media-based learning Mobile Application that has been designed is valid or not, where validity is the significance, usefulness and appropriateness of the test so that the product can be applied.

After the instrument practicality declared invalid by the validator, and then some of the instruments used to test the practicality, in which a product is said to be practical if tests show results that can be trusted and are not contradictory.The instrument used in the form of a questionnaire testing the practicality of practicality.

How to test the effectiveness of Mobile Application-based learning media as a learning resource by using the effectiveness test questions
Validity Analysis based learning media Mobile Application

a) Scoring answers with criteria based on a Likert scale modified by Sugiyono (2014: 93), namely:

Table 1. Assessment Answers validity

Selection	Information	Weight
Strongly agree	SS	5
Agree	S	4
Less Agree	KS	3
Disagree	TS	2
Strongly Disagree	STS	1

Source: Sugiyono (2014: 93)

b) Determining the highest score
The highest score = number of validators x number of items of questions x maximum score.
Determine the total score of each validator by summing all the scores obtained from each indicator.
c) Determining the score obtained by summing the scores of each validator.
d) The determination of the validity of the modified value of Purwanto (2010) as follows:
e) Provide an assessment of the validity of the modified criteria of Purwanto (2010) the following:

Table 2. Classification Aspects of Assessment Validity

No.	Value	Rated aspect
1	90% -100%	very Valid
2	80% -89%	valid
3	65% -79%	enough Valid
4	55% -64%	Less Valid
5	$\leq 54\%$	Invalid

Source: Purwanto (2010: 82)

Table 3. Rate practicalities

No.	Value	Rated aspect
1	86% -100%	very Practical
2	76% -85%	Practical
3	60% -75%	Practical enough
4	55% -59%	Less Practical
5	$\leq 54\%$	not Practical

Source: Purwanto (2010)

Analysis based learning media Effectiveness Test Mobile Application

Data about the effectiveness test android-based learning media is obtained by calculating the

scores of students who answered each item as contained in the test question.Results obtained be interpreted using the following criteria:

Table 4. Assessment of Effectiveness

No.	Value	Rated aspect
1	86% -100%	Very effective
2	76% -85%	Effective
3	60% -75%	Effective enough
4	55% -59%	Less effective
5	≤ 54%	Ineffective

Source: Purwanto (2010: 103)

RESULTS AND DISCUSSION

Result

1. Home page

Home page is a page   first when you open media-based learning *Mobile Application*, home picture is as follows:

Figure 2. Home page

2. Main Menu page

The main menu page is the main page in the Mobile Application based learning media. The main menu page picture is as follows:

Figure 3. Menu

In the picture above the main menu page, there are six navigation buttons. that have their respective functions. Navigation on learning media is adjusted to the image with the content in it.

Validity test is done by 3 validators for instructional media based mobile larningusing the app inventor in the review of aspects (1) Eligibility content: 90.66%; (2) Linguistic Components: 88.32%; (3) Components Presentation: 86.67%; (4) Graphical Components: 96%. Overall assessment validator test against android-based learning media by 90.33%, so that mobile-based learning media learning using the app can be said to be very valid inventory used by students for learning Simulation and Digital Communications. In the research of Wijaya, I., & Sefriani, R. (2021, March). on the validity of a learning media shows the level of validity is very valid which means it is not much different from the research conducted. Sefriani, R., Wijaya, I., Menrisal, M., & Dewi, M. (2020) in their research is also related to the level of validity of products or learning support media concluding that the media developed is feasible or very valid to use.

Tabel 5. Interval Kelas

No.	Class - Intervals	F0	% F0
1	80-83	1	33.33
2	84-87	0	0
3	88-91	0	0
4	92-95	1	33.33
5	93-96	1	33.33
	total	3	100
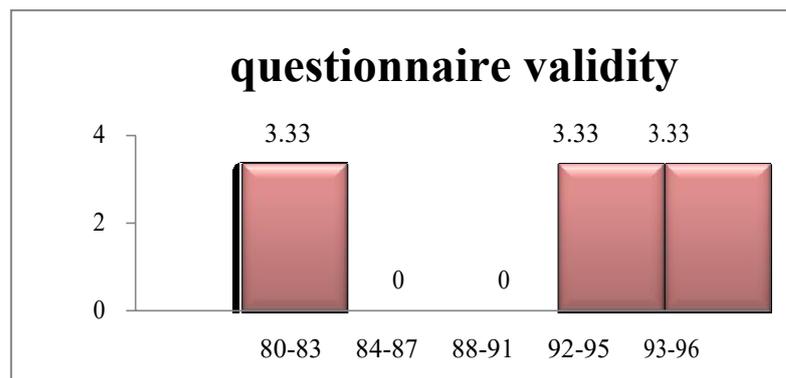
Figure 4. Histogram Validity

Test Practicalities

Practicalities trials conducted by 34 students. Mobile-based learning media assessment larning use inventoryang app in terms of aspects (1) Circumstances of Use: 88.31%; (2) Effectiveness of Learning Time: 86.06%; (3) Benefits: 86.94%. Overall assessment test to study media android practicalities of 86.77%, so that the media can be said to be very practical to use students for learning Simulation and Digital Communications.

Table 6. Distribution Frequency Questionnaire scores practicalities

class interval	f0	% f0
63-66	1	2,94
67-70	0	0
71-74	8	23.52
75-78	6	17.64
79-82	12	35.31
83-86	7	20.59
total	34	100

Source: Independent Data Processing
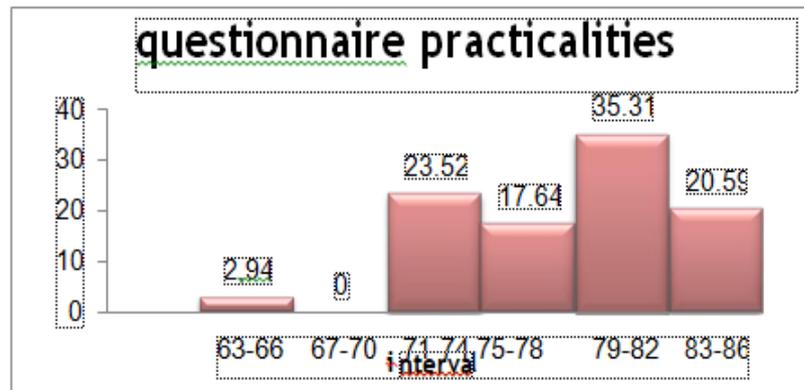
Figure 5. Histogram Practicality

Test Effectiveness

Test the effectiveness of the assessment carried out by 34 students. Valuation based learning media mobile app inventoryang larning use in terms of each item on the average value of the whole matter is 87.29% so that the mobile-based learning media larning using the app can inventor is said to be very effective for students for learning Simulation and Communication Digital. With the existence of learning using learning media based on the app inventor application, it is hoped that it can improve student learning outcomes, student learning activities and students are increasingly motivated to do independent learning. This is supported by statements in the research of Wijaya, I., Sefriani, R., Radyuli, P., & Andrayani, L. (2019, December).
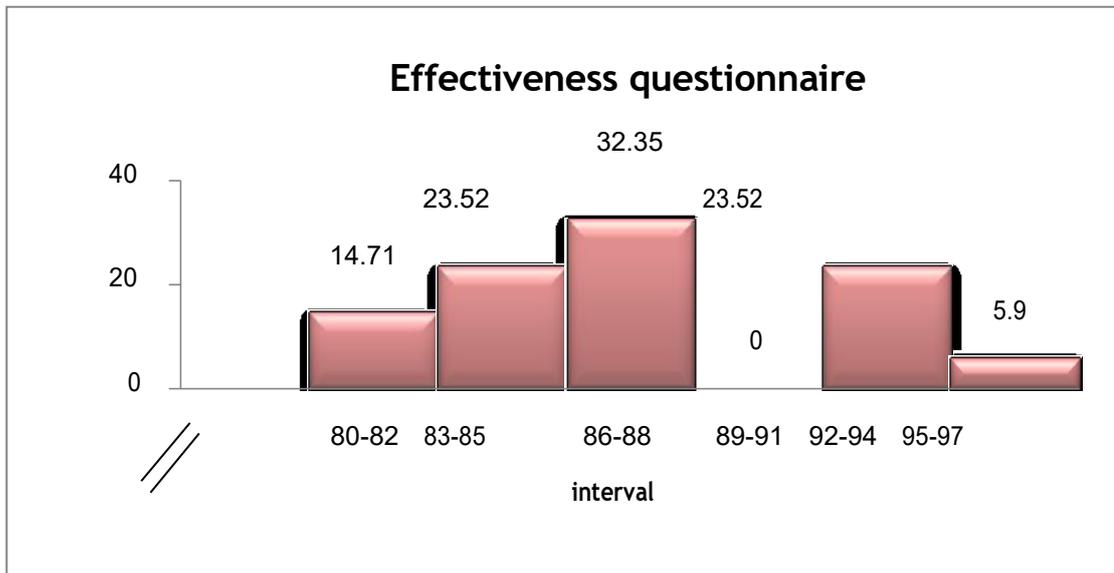
Figure 5. Histogram Effetiveness

Discussion

The product produced in the form of learning media has been tested for its validity level with a very valid category, then the level of practicality has also been tested and data analysis shows that it is very practical to be used by teachers and students in learning. The effectiveness level test was also carried out which showed that it was very effective in increasing student learning activities, increasing learning independence and students' willingness to use this media to support learning. This is also expressed in the research of Wijaya, I., & Sefriani, R. (2017). Other research related to this is also revealed by Sefriani, R., & Veri, J. (2021) that the level of validity, practicality and effectiveness of a product must be a reference for producing a media or learning tool. With the supporting media in learning in the form of this application, it will increase the creativity of teachers in developing learning

methods that are in accordance with the media produced. Setiawan, H. W., & Wiyardi, R. S. (2015) stated in their research that the presence of learning media based on the Inventor app can increase students' interest in learning and students' ability to learn independently. Setiawan, W. (2021) revealed that the use of app inventors in making learning media provides great benefits for students. Syaputrizal, N., & Jannah, r. (2019) stated in his research that learning media using the app inventor application was able to increase the learning independence of students. Also supported by research that has been done by Surbakti, a. R.U., & abe, n. The learning media product is declared suitable for use by teachers and students as learning media in schools and as independent learning media.

CONCLUSIONS AND SUGGESTIONS

The conclusion of this study is that the learning media designed and developed using the 4-D development model shows the validity test results are in the very valid category, while the level of practicality or practicality in using this learning media is in the very practical category, as well as the level of effectiveness. This learning media also shows a very practical category used by students in the learning process so that it is hoped that it can improve students' independent learning abilities, increase learning outcomes, achieve learning goals and student learning motivation with the COVID-19 pandemic condition also shows an increase. Setiawan, W. (2021) in his research also produced a learning media by going through the validity, practicality and effectiveness of the media. It is recommended that future researchers who will conduct or continue similar research can use the latest applications and take into account the character of students and conditions in life in society. Conditions outside the COVID-19 pandemic will of course be different from the pandemic conditions, so researchers can adjust them.

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