

Increasing Interest for Student Learning of Light Vehicle Engineering in Vocational Schools Through the Development of Proteus Simulator Media after the Covid-19 Pandemic

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Keywords: Interest in Learning, Development of Media Proteus.

Abstract: The purpose of this study is to develop learning media through proteus simulator media in the subject of Automotive Fundamentals (DDO) to increase the interest in learning vocational high school (SMK) class X automotive light vehicle engineering competencies. This type of research uses at of research and development (R & D) with an ADDIE development model. This research phase includes analyze, design, implement and evaluation. Validation and reliability of research instruments were carried out with two media judgment experts and one material expert. The feasibility of the media is determined by the assessment of material experts and media experts. Practicality of the product through the assessment of teachers and students. Students' interest in learning is based on a questionnaire of student interests. Data collection is carried out by observation and questionnaire. As for data analysis, it uses descriptive analysis. This type of research uses atype of research and development (R & D) with an ADDIE development model. This research phase includes analyze, design, implement and evaluation. Validation and reability of this research results in the form of a simulator media with a proteus application on simple electrical circuit materials for class X students of Light Vehicle Engineering developed through research and development of the ADDIE model. Media eligibility based on media experts has a percentage of 93.75% classified as very feasible, while media practicality has apercentage of 85.21% classified as very feasible and students' interest in learning has an increase of 74.6% which is included in the moderate category.

1 INTRODUCTION

The Covid-19 pandemic is one of the world events crisis that has caused problems towards invarious sectors, including the education sector. The learning process must be limited by distance, this is because the virus is so dangerous and extremely contagious. The efforts were attempted by the government to prevent the transmission of the Covid-19 virus and by made a crowd-limit policies and activities.

The policy that were carried out by the government also pose risks in the process of learning activities. The impact of the policy for imposing restrictions on community activities that were recommended by the government is the occurrence of restrictions in the process of teaching and learning activities. The learning process that was previously

carried out face-to-face must be carried out using a distance learning model. This led to changes in the culture of teaching and learning. The teacher's process of observing children's development both in terms of attitudes, knowledge and skills becomes completely limited. Students tend to be struggling in their observation as this pandemic has led to learning loss and lack of acknowledgment.

Vocational High School is an educational institution to form students so they can have the provision of knowledge to face the industrial era 4.0. In this era, students are formed to have 4 skills, such as collaboration, communication, critical thinking, and creativity so that they are fully prepared to enter the 4.0 generation, or to be known as the Cyber Physical system. Vocational High Schools are also affected by the presence of Covid-19. Learning in Vocational High Schools consists of learning theory

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and practice. With the imposition of restrictions on community activities, learning activities, both theory and practice, cannot be carried out face-to-face.

The occurrence of learning loss and lack of acknowledgment in Vocational High School students in particular raises concern for the Government. Various attempts were made to overcome this problem. Curriculum changes implemented are one that can overcome the occurrence of learning loss which is often known as the independent curriculum. After the covid pandemic were decreased, learning activities were finally allowed to hold limited face-to-face learning and teaching process.

Based on the results of observations at State Vocational High School 1 Seyegan, Sleman district, Special Region of Yogyakarta on the "Teknik Kendaraan Ringan dan Otomotif" competence, it is currently permitted to hold 100% face-to-face meetings in both theoretical and practical learning. However, there is still a time limit, which to be on term that each subject or classes has 35 minutes time limit. Class X already begun the usage of "Kurikulum Merdeka" whilst classes XI and XII still use "Kurikulum 2013".

The impact of learning "Teknik Kendaraan Ringan dan Otomotif" for students is reduced interest in learning. Interest in learning is the willingness to participate in learning activities that originate from conscience (Suprijanto, 2007: 25). According to Muhibbin Syah (2012: 136) that, "interest in learning is atendency and high enthusiasm or a great desire for something." So, asking to learn can be concluded high desire and curiosity to participate in learning activities. The cause of the decreased interest in learning is that students are accustomed to learning using a distance learning model, this creates a feeling of laziness and lack of enthusiasm in participating in learning at school. Therefore, teachers are required to innovate in order to overcome these problems. One of the innovations that can be done is with simulator learning media.

Digital simulator learning media in the application forms can be used to flexible study both in terms of location and time. Changes in the atmosphere of the process to teaching and learning activities such as adding simulators in interesting media and leading to basic competencies and computers can be used as an alternative to make students more motivated to concentrate on learning. One usage for the learning medium is the development of computer-based learning media simulator models. The simulator model is a model for delivering information or messages in the form of a concept presented on a computer screen with text,

images, or graphics (Reza Mega Mawarni, Rina Harimurti, 2016).

In "dasar-dasar otomotif" subject, there is especially basic electricity material. With this simulator media, it is hoped that students will be more interested and increasing their curiosity in the basic material of electricity. This material itself has the competence to carry out simple electrical circuits. Which is the initial foundation of light vehicle electrical material. So, with this media it is very suitable when using this media simulator.

There are many simulators application models that can be used as learning media, one of which is the proteus software. This software is one of the electronic software used to design and simulate electronic circuits so that the software is chosen as a suitable learning medium to support learning of simple electrical systems. By using the proteus application, digital system learning activities are easier to understand (Syahminan, 2020).

Based on the description above, it is very important to develop simulation-based learning media to support practical learning of lighting systems that can improve student competence. Simulator learning media is expected to be able to help students for simulating an assemble of a series to simple electrical systems so that when carrying out practices it can reduce trial and error as the learning can run effectively and efficiently.

2 METHOD

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2.1 Page Setup

This type of research uses the type of Research and Development (R & D) with the ADDIE development model. This research phase includes analyze, design, implement and evaluation.

Validation and reliability instrument of this study was conducted with two people media experts judgement and one skilled matter experts. The worthiness of the media determined by an assessment of the people’s matter and media experts. Practicality, teachers and students were conducting products through an assessment. The people’s material to agrating validation were being explained in the following table.

Table 1: Material expert validation instrument.

No	Aspect	Indicator
1.	Learning Design	Compatibility with learning outcomes and Learning objectives.
		Specific learning materials.
		Illustrations that support learning materials.
		Practice question that support learning.
2.	Material Aspect	Does not depend on teaching materials/other media.
		Adjusting science and technology,as well as being flexible to use.
3.	Utilization	Useful in helping learning.

Based on the grid from material experts, there are several indicators, including conformity with learning objectives and achievements, more specific materials, illustrations that support learning materials, practice questions that support learning, are not dependent on teaching materials and other media, adjust to science and technology, and are flexible to use and useful in helping learning.

In the other hand formed in an experts, the aspects assessed include media quality,word usage and media layout for the media experts grid which are explained in the following table.

Table 2: Media expert validation instrument.

No	Aspect	Indicator
1.	Media Quality	Quality of the simulator
		Ease of use
		Text clarity/readability
		Image quality
2.	Sentence usage	Quality of word usage
3.	Media layout	Simulator serving quality
		Layout

Media feasibility is carried out by conducting small-scale trials and large-scale trials. Media feasibility test based on questionnaires distributed by students. Media fit test indicators are described in the following table.

Table 3: Media fit test instrument.

No	Aspect	Indicator
1.	Material	Material suitability
		Does not depend on teaching. Materials/other media
		Ease of operation
		Ease of choosing material
		Clarity and appearance display
		Useful for learning

Interest in student learning based on interest questionnaires.Data collection was carried out by observation and questionnaires. The questionnaire itself was made based on a differential sematic scale created using the Google form application. The differential sematic scale is illustrated in the following figure.

Table 4: Sematic diferensial scale.

Very Negative	1	2	3	4	5	6	7	Very Positive
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Validation of interest in learning is carried out using construct validation, namely aform of compatibility testing which is carried out by comparing the theories contained in the questionnaire with the theoretical basis used to define a concept, Zainal Mustafa EQ (2009: 166). Based on testing the construct validity of the interest in learning questionnaire,it was found that there were 8 questionnaire numbers that failed because its less than 0,244.

As for data analysis using descriptive analysis.The data obtained from the descriptive analysis include Mean(M),Median(Me),Mode(Mo),

Standard Deviation (SD), maximum values, minimum values, frequency distribution tables, histograms, and variable trend tables.

3 RESULT AND DISCUSSION

Based on the results of the development of the Proteus software simulator media which had previously been validated by media experts, material experts, small-scale trials and large group trials,the following results were obtained.

1. Based on the design of learning media software proteus media in the eyes of electricity learning material, it can be accepted by class X “Teknik Kendaraan Ringan dan Otomotif” competence
2. Assessment of material experts based on the media developed includes learning design, material aspects and material utilization.
3. Results of small group and large group trials of class X “Teknik Kendaraan Ringan dan Otomotif” at Vocational High School 1 Seyegan.

Small group trials were carried out by distributing questionnaires with 11 respondents and large-scale trials with 23 respondents.

Based on the media expert's assessment, it was explained that learning design has a value of 43 in a percentage of 76.78%, while the material aspect has a value of 26 in a percentage of 90% and media utilization has a maximum value of 100%. The three categories of media are included in the very feasible category.

In the other hand formed in an expert the aspects assessed include media quality, word usage and media layout which are explained in the following table.

Table 5: Media Expert Assessment Results.

Mediaquality.	Sentenceusage.	MediaLayout.
37	8	30
92.50%	100%	93.75%

In the table above it is explained that the quality of the media has a percentage of 92.50%, the use of words is 100% and the layout of the media is 93.75%. It can be concluded that the Proteus software media is classified as very feasible based on media experts.

The results of the next data are assessments according to material experts. Material expert validation is selected based on the level of education and length of teaching on the material. Based on the assessment of material experts, the following results were obtained.

Table 6: Material Expert Assessment Results.

Learning Design.	Material Aspect.	Utilization.
76.78%	90%	100%

Based on the table above it is explained that the learning design according to material experts is 76.78%, for material aspects is 90% and for utilization is 100%. Cumulatively, it can be concluded that according to material experts, the learning media for Proteus software is very feasible.

Table 7: Large scale media trials.

Material.	Learning Design.	Appearance.	Utilization.
87.39%	79.34%	84.37%	88.58%

In the table, it is explained that the material aspect has a percentage of 87.39%, learning design has a percentage of 79.34%, for display is 84.37% and in terms of usefulness it has a percentage of 88.58%. So it can be concluded that large-scale trials get very decent categories.

To measure student interest in learning, the implementation of the Proteus software simulator media was carried out on the basic material of automotive electricity on learning interest. The results of the study show that interest in learning has an increase of 74.6% which is included in the moderate category. The description of the implementation of media on learning interest is described in the following table.

Table 8: The results of increasing student learning interest.

No.	Frequency.	Percentage(%)	Category
1	3	9,0	High.
2	14	4,6	Medium.
3	10	16,4	Low.
Total.		100,0	

explained that with a total of 27 students, 3 students experienced a high increase, 14 students had a moderate increase, and 10 students had a high increase.

Below are the advantages of media simulator with proteus software.

1. Proteus software media can make it easier for student to better understand the basics of electricity.
2. Proteus software media can be used individually.
3. Proteus software media can prevent trial and error in understanding the learning process.
4. Proteus software media is more flexible regarding usage and usage time.

Below are the disadvantages of media simulator with proteus software.

1. Requires electricity when using media.
2. The material discussed is only about the basics of electricity.

4 CONCLUSIONS

Proteus software media was developed through research and development of the ADDIE model. Media feasibility based on media experts has a percentage of 93.75% which is classified as very feasible, while the practicality of the media has a percentage of 85.21% which is classified as very feasible, and the implementation of student learning interest has an increase of 74.6% which is included in the medium category.

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