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Media Starter System: Development to Improve Student Learning Outcomes

Suyitno^{1, a)} Pulung Dwi Hartanto^{2, b)} Purnawan^{3, c)} Arif Kurniawan^{4, d)}, Muhammad Nurtanto^{5, e)} Farid Mutohhari^{6, f)}

Author Affiliations

^{1,2} Universitas Muhammadiyah Purworejo, Indonesia

^{3,4} Universitas Ahmad Dahlan, Indonesia

^{5,6} Universitas Sultan Ageng Tirtayasa, Indonesia

Author Emails

^{a)} yitno@umpwr.ac.id

^{b)} pulungdwiarto13@gmail.com

^{c)} purnawan.purnawan@pvto.uad.ac.id

^{d)} arief.kurniawan@pvto.uad.ac.id

^{e)} mnurtanto23@untirta.ac.id

^{f)} farid@untirta.ac.id

Abstract. This study aims to 1) find out the procedure for developing starter system learning media as a learning tool for improving student learning outcomes, 2) knowing how appropriate the learning media is for improving student learning outcomes, 3) knowing student learning outcomes after using starter system learning media. The type of research used is Research and development (R&D) to produce products and test products in improving student learning outcomes. The research subjects were 50 students. Data collection techniques in this study used tests, questionnaires, and documentation. The data obtained are the results of the evaluation, student responses about the media, validation and reliability. The results of the assessment by media experts get a percentage of 97.50% in the very very good category, the material expert assessment gets a percentage score of 92.5% in the very valid category. Student responses went through two stages, namely the limited group trial of the media getting a score percentage of 92.25% in the very good category and the media response taken from the experimental class which was the subject of the application of the media to get an average value (mean) of 83.2, so that the information obtained by 17 students was stated passed and 8 students were declared to have not passed because the score was still less than the KKM, so it could be concluded by looking at the results of the media assessment, the media was in the very good category.

Keywords : Learning Media, Starter System, Learning Outcomes

INTRODUCTION

Education is the right means to prepare the workforce, provision for the future and also to form good citizens so that education carries out a very broad function because it involves all aspects of human life. Education is basically an interaction between educators and students in achieving educational goals that take place in a certain environment. The interaction of mutual influence between educators and students in the teaching and learning process is called educational interaction. In educational interaction, educators and students are the main subjects who interact with each other. In addition to the main subject, there are other subjects in educational interaction in the form of learning tools or media used in education and a place where the educational process occurs (educational environment). Vocational Education is education that prepares for the world of work [1] [2]. Vocational education will be successful if the world of education is the same as the world of work [3]–[5].

Learning is a process of change or behavior that is relatively good in thinking that is done intentionally which can make changes between individuals that are carried out naturally from within themselves because of the interaction of individuals with their environment . Learning process of change in behavior as a result of individual interactions with the environment in meeting their needs [6], [7] . Learning activities aim to obtain optimal results. This can be achieved if students as learning subjects are actively involved in the teaching and learning process. Teachers as educators are expected to create a learning condition that allows students to develop and achieve achievements. Student achievement is often indicated by student learning problems in understanding the material. This can be caused by the learning factors of students who are less effective, even students themselves tend not to feel motivated in participating in the learning process in the classroom, resulting in students not understanding the material presented by the teacher. On the other hand, students also have different backgrounds.

Based on observation activities, it was found that in the subject of the starter system the learning support facilities and infrastructure available at SMK Muhammadiyah Purwodadi were still lacking. The lack of learning facilities and media causes students to be less interested and unmotivated in participating in learning activities, this is certainly a factor in the lack of maximum student learning outcomes. It was found that student learning outcomes in electrical subjects, especially in the KD starter system, were still far from expectations, namely 25% of students who passed the minimum completeness criteria (KKM). In addition to the factors that the researchers have mentioned above, the media used by the teacher also greatly determines whether or not students' competence is achieved.

Media learning is a means or educational tools that can be used as an intermediary in the process of learning to enhance the effectiveness and efficiency in achieving the goal of teaching. In a broader sense, learning media are tools, methods and techniques used in order to make communication and interaction between teachers and students more effective in the learning process in the classroom. Based on technological developments, learning media can be grouped into four groups, namely (1) media resulting from print technology, (2) media resulting from audio-visual technology, (3) media resulting from computer-based technology, and (4) media resulting from a combination of print technology. and computers [8] .

System starter is a mechatronic circuit that functions rotate the crankshaft using electricity today will start the engine. An engine cannot start by itself, so the engine requires external power to rotate the crankshaft and help start the engine [9] . H acyl learning is influenced by several factors such as teaching methods, curriculum, teacher relations with students, student relationships with students, school discipline.

Media as a teaching aid is growing very rapidly along with technological developments [10] . The variety and types of media are also quite large so that they can be utilized according to the conditions, time, budget, and material to be delivered. Media learning is a means or educational tools that can be used as an intermediary in the process of learning to enhance the effectiveness and efficiency in achieving the goal of teaching [11], [12] . Based on technological developments, learning media can be grouped into four groups, namely (1) media resulting from print technology, (2) media resulting from audio-visual technology, (3) media resulting from computer-based technology, and (4) media resulting from a combination of print technology. and computers [13], [14] . The use of media in the teaching and learning process is expected to foster interest in learning, motivation to learn, clarify facts, and make it easier for students to understand the material presented by the teacher. Given the importance and magnitude of the benefits of using media in learning, it is necessary to make efforts so that learning media are functioned as they should in the learning process in schools. This is proposed because in reality there are not many schools that function learning media in the teaching and learning process in the classroom.

RESEARCH METHODS

The research used by the researcher is to use a research and development (R&D) design . The method is the development of research methods used to produce a particular product, and test the effectiveness of product [15] - [17] . The population and samples taken were students of class XI TKRO A SMK Muhammadiyah Purwodadi , with a total of 25 students in the Experiment class as the object of research using interactive multimedia-based learning media as a starter system, while 25 students in the Control class in class XI TKRO B SMK Muhammadiyah Purwodadi .

DISCUSSION

- Analysis
 - Needs Analysis

Analysis of new learning methods needs to be carried out to determine the feasibility if the learning media is applied. At this stage of needs analysis, it is done by observing the learning process of class XI students on the subject of light vehicle electrical maintenance that takes place in the classroom. From the observations made, the results obtained are:

- Students are less interested and not motivated in following the learning process in the classroom.
- Teaching and learning activities in the classroom are still dominated by teachers who use the lecture method so that students look passive and less active in developing themselves.
- The availability of learning media facilities for the starter system is still limited, this is evidenced by the use of learning media used during learning which can still be considered normal, namely using power point media.
- Low interest in learning, this is influenced by the use of media that can be considered conventional which results in student learning outcomes in the starter system material.

- **Material Analysis**
Material analysis activities include identifying the main material that will be made in the media. The subject matter studied by teachers and students is included in the syllabus according to the subjects studied. The main material in the syllabus consists of one main material and sub-materials that are included in the main material section. This subject matter facilitates the collection and selection of material relevant to the subject matter. The determination of the material is also consulted with the automotive electricity teacher. From the results of the material analysis, the researcher got the right material to be appointed in development research, namely the starter system material.
- **Design**
In designing new learning media, the design stage is similar to designing teaching and learning activities. This activity is a systematic process that starts from setting learning objectives, designing scenarios or teaching and learning activities, designing learning tools, designing learning materials and evaluating learning outcomes. The design of this learning media is still conceptual and will underlie the next development process.
After knowing the results of both needs analysis and material analysis, the next step is design . In the design stage, the design of the starter system learning media begins with various stages, namely:
 - Formulate how the concept of the starter system learning media.
 - Designing a starter system learning media.
 - Prepare the tools and materials needed in the third stage, namely development .
- **Development**
Development in the ADDIE model contains activities for realizing the design of media products to be developed. In the design stage, a conceptual framework of the starter system learning media has been compiled. In the development stage, the conceptual framework is realized into a product that is ready to be implemented in classroom learning.
- **Implementation**
At this stage the learning media for the starter system is implemented by design and media that have been developed at the development stage in a real situation, namely in classroom learning. The first implementation or trial was carried out in a limited field or small group which aims to find out the shortcomings of the starter system learning media. If the small group trial still does not achieve the desired increase in learning outcomes after using the learning media, a revision is carried out and if in the small group trial it can be said that the next step is Implementation or the second trial phase with broad field or group testing. big. During the implementation of the learning media the starter system that has been developed is applied to the actual conditions. In each implementation, either a limited field trial or a large field trial, the material is delivered according to the starter system learning media that has been developed.
 - **Limited field test (small)**
The limited field test was carried out on Thursday, December 26, 2020 at SMK Muhammadiyah Purwodadi in class XI TKRO with 10 respondents, the following data were obtained. From the limited field test results above get 369 results from the maximum score of 400 an obtained an average percentage of 92.25%. From these results, it can be concluded that the learning media that has been developed can be said to be very good.

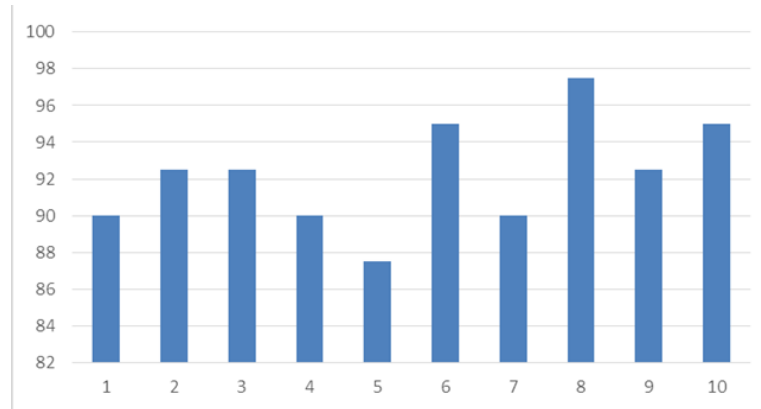


FIGURE 1. Limited (small) field test results

- Large field test (extensive)

A large field test was carried out on Thursday, December 26, 2020 at SMK Muhammadiyah Purwodadi with class XI TKRO A and XI TKRO B with a total of 50 as research subjects. With the provision that 25 students of class XI TKRO A as a control class and 25 students of class XI TKRO B as an experiment.

- Control Class Pre-test Results

The data from the control class pre-test started with a value of 20 as the lowest value and 85 as the highest value. From the results above, the average value (mean) is 53.8, so that it is obtained information that 4 students have passed and 21 students have not passed because the score is still less than the KKM.

- Control class post test results

The data from the control class pre-test started with a value of 25 as the lowest value and 90 as the highest value. From the results above, the average value (mean) is 62, so that it is obtained information that 5 students have passed and 20 students have not passed because the score is still less than the KKM.

- Experimental class pre-test results

The experimental class pre- test data started with a value of 25 as the lowest value and 85 as the highest value. From the results above, the average value (mean) is 52.4, so that it is obtained information that 4 students have passed and 21 students have not passed because the score is still less than the KKM.

- Experimental class post test results

The experimental class post test data started with a value of 55 as the lowest value and 100 as the highest value. From the results above, the average value (mean) is 83.2 , so that it is obtained information that 17 students have passed and 8 students have not passed because the score is still less than the KKM.

- Evaluation

Evaluation is the last stage in this development, at this stage after the new learning media is implemented in the learning process, then the media is assessed to determine the feasibility and shortcomings of the starter system learning media that has been developed. At this stage, the researcher distributed a questionnaire containing questions including the starter system learning media that had been developed by the researcher. The results of the evaluation are used as a reference for researchers in making improvements to the learning media that have been developed so that the media can and is feasible to use in the learning process [18]–[20] . From the results of the media response in getting the students above average yield percentage of 93 , 20 % . From these results, it can be concluded that the starter system learning media that has been developed can be said to be very good and ready to be used for the learning process in the classroom.

CONCLUSION

Based on the research results, the following conclusions can be drawn: 1) the process of making learning media in this study was carried out through five stages, abbreviated as ADDIE, namely Analysis, Design, Development, Implementation, and Evaluation. 2) learning media products can be used to improve student learning outcomes in sister starter subjects which can be seen in the difference in the evaluation results of the control class getting an average score of 62 and the experimental class getting an average score of 83.2.

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