



Development Of Delphi-Based Learning Media in Electrical and Electronic Basic Students in SMKN 2 Serang

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Abstract: The development of science and technology has a direct impact on the preparation of a qualified workforce, including the preparation of workforce graduates of Vocational High Schools. One of the learning materials in Vocational High Schools is basic material on electricity and electronics. Introduction to the basic material of electricity and electronics will be very difficult if only with books. Therefore, this study aims to create an interesting and interactive learning media. This media uses the Delphi program. In the learning media, there are materials and exercises for basic electricity and electronics subject matter for passive components of RLC. The design of this learning media development follows the ADDIE stage (Analyze, Design, Development, Implementation, Evaluation). The validation of this learning media program includes validating the content and design of the media itself. Based on the results of data analysis, it was found that the learning media developed in this study had a very high validity value from the two aspects assessed. For the validity of the learning media subject matter, the results of validation by experts are 3.61 and validation by the teacher is 3.6 so that it is very relevant to the concepts to be taught using this media, while for the validity of media design by experts is 3.5 and by the teacher 3.62 so that the learning media This research can be declared fit for use to support learning in school.

Keywords: Learning media, Basic electricity and Electronics, development, delphi

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INTRODUCTION

Currently the development of science and technology has developed very rapidly. The very rapid development of science and technology requires the preparation of a qualified workforce, including the preparation of workforce graduates of Vocational High Schools. Based on Law Number 20 of 2003 concerning the National Education System, it is explained that the purpose of vocational education is to prepare students to be ready to work in certain fields. In the Audio Video Engineering Skills Competencies (TAV) at SMKN 2 Serang there are competencies that must be mastered by students, one of which is Basic Electrical and Electronics Subjects. Basic Electrical and Electronics Subjects are one of the subjects for class X students of the TAV Skills Competency at SMKN 2 Serang. Mastery of Basic Electrical and Electronics subjects is needed, because this material is a basic material that will be very useful for further learning such as Digital Electronics and Microcontroller subjects.

Based on the results of observations at SMKN 2 Serang, learning in the basic subjects of electricity and electronics in class X of the TAV Skills Competency in the even semester of the 2019/2020 school year, data on learning outcomes were less than optimal. The learning outcome data obtained during the observation is that most of the students scored below the minimum completeness criteria (KKM) 75 (KKM Terms for TAV Skills Competency at SMKN 2 Serang), so it is necessary to provide remedials to obtain completeness of learning outcomes. From observations during the learning process, some students did not pay attention to the teacher's explanation, students also did not read textbooks and did not do worksheets if they were not asked or ordered by the teacher and when the teacher gave homework the students did not do it at home. This is because the book learning media used by students looks boring. Therefore, this study aims to create a learning media for basic materials of electricity and electronics using an interesting and interactive Delphi program. This learning media contains basic learning materials for electricity and electronics, complete with calculations and practice questions. It is hoped that the use of Delphi-based learning media in learning Basic Electrical and Electronics subjects: (1) can help students' imagination with real object images; (2) as a method of activating students' views and skills in an activity; (3) students will be more interested in paying attention to the material being taught; (4) students will better understand the material presented by the teacher; and (5) can assist students in practicing some measurement procedures in Basic Electrical and Electronics subjects.

METHOD

According to Husni (2004, p.1) Delphi is Borland's very popular software. Unlike Windows software in general, Delphi is not application software, such as MS Office or games. Delphi is a programming language, which is an application for creating other applications. Delphi is used to build Windows applications, graphic applications, visual applications, and even network applications. Borland Delphi is a Windows-based programming language. Delphi can help to create various kinds of applications that run on the Windows operating system, from a simple program to a client / server or network based program. Delphi including applications that can be use. This research was conducted at SMKN 2 Serang. When the research was carried out from July 2021 to

October 2021. This research is included in the ADDIE model research (I Made Teguh, 2014), because in this study will describe the results of testing the validity of the multimedia program RLC passive components for learning in vocational schools by experts. The instrument that will be used in this research is a validation questionnaire. Validation was carried out by 3 experts and 2 teachers and 5 students' user responses. To test the validity of Borland Delphi 7 based learning media, the required data is obtained from the validator by means of validation by filling out a validation questionnaire. To analyze the validity of the program as a learning media for Basic Electricity and Electronics on the subject matter of the passive components of RLC, content validation was carried out by the validators, namely experts in Basic Electricity and Electronics and Basic Electricity and Electronics teachers. The data analysis technique used in this research is descriptive analysis, namely by calculating the index of each media instrument indicator. The indicators are used to determine the availability of the device.

RESULT AND DISCUSSION

The passive component RLC learning media device made in this study consisted of the RLC passive component learning media program developed from the Borland Delphi 7 software. The development of this learning media followed the ADDIE stage (I Made Teguh, 2014). The results of learning media can be seen in Figure 1, Figure 2, Figure 3 and Figure 4.



Figure 1. The start page of learning media



Figure 2. Learning media selection page

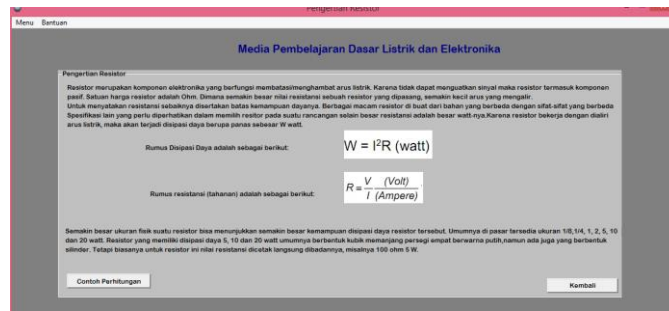


Figure 3. Learning media material page

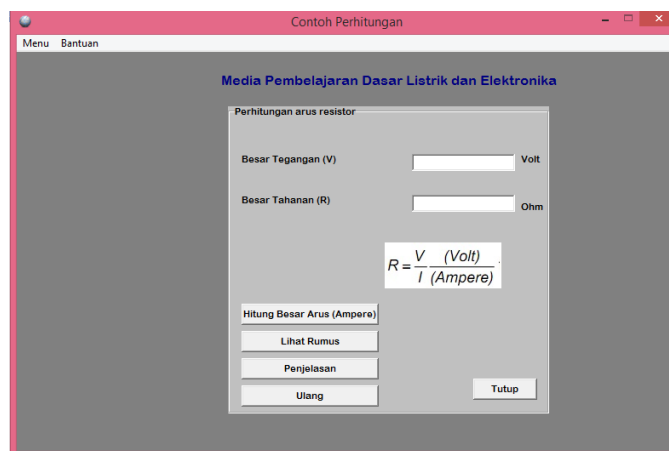


Figure 4. The practice page for learning media questions

The start page contains an OK button which opens the log in page, an exit button to exit the media and a welcome expression and the title of the material. The options page consists of two columns, namely a database containing complete material in the form of words and pdf and a menu containing short material and question lessons. The material page contains buttons that will lead to certain pages such as device pages containing learning tools. This page also has interesting illustrations of electrical components. The question practice page contains Lathan's questions based on the formula. Development of learning media through the ADDIE stage (I Made Tegeh, 2014). The analysis phase includes analyzing the passive component of RLC and making learning tools. After the analysis stage is revised by the supervisor, then it enters the design stage, at the media design stage, it begins to be designed according to the learning device and the material that has been analyzed after that it is revised by the supervisor. The development of instructional media has passed the evaluation stage, namely validation by experts and teachers. This learning media for passive RLC component material includes features that teachers and students can use with attractive displays such as passive RLC and multimedia components. Figure 5 below shows the final results of the validation carried out by experts and teachers.

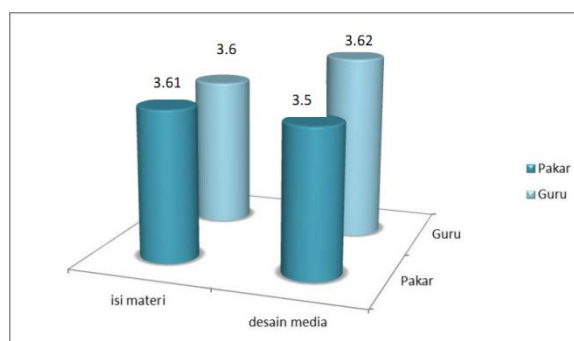


Figure 5. Diagram of the results of validation by experts and teachers

Based on Figure 5, the assessment of material content validation and design by experts and teachers reaches a very high category. For user responses from students, it can be seen in Figure 6.

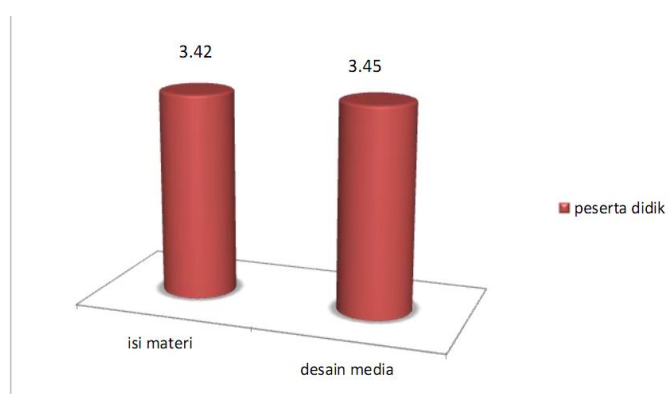


Figure 6. User responses by students

Based on Figure 6 shows the responses by students who use this media get a very high category score. The validator in the implementation of this research practically acts as a contributor who actively provides suggestions and input for the improvement of the RLC passive component learning media program tool. This can happen considering that the main objective of this study is to obtain an effective and valid passive component of learning media for RLC. The results obtained from the validation assessment by experts and teachers for the content of the material are 3.61 and 3.6. While the design validation reaches a value of 3.5 and 3.62, this shows the validation results for the content of the material and the design by experts and teachers have a very high category so that it is suitable for use as a learning medium. The development of learning media is also supported by other researchers who develop learning media using ICT (information and communication technology) such as research conducted by Siti Aniqotunnisa (2013) who developed interactive quiz learning media with macromedia flash getting very good ratings. The development of gravitational force animation as a learning medium by Rahmat Taufiq (2010) received very high ratings. The advantage of this learning media is that students can use this media because there is a special page for students, namely the question training page. In addition, this media has a database page that contains a database of materials in the form

of words and pdf that can be edited and printed. The drawback of this learning media is that you have to install the Borland Delphi 7 application first. Lack of supporting sound facilities. The design, colors and images are still not varied.

CONCLUSION

The development of instructional media for the passive component material of RLC follows the ADDIE stage and has passed the evaluation stage, namely validation by experts, teachers and students. Learning media For electr wave material, the passive component of RLC includes features that teachers and students can use with attractive displays such as illustrations of passive RLC components and multimedia. For lathan questions that can be done directly on each student. Based on the results of the data obtained, the content validity index of the RLC passive component learning media material by experts, teachers and students reached very high scores so that the Borland Delphi 7-based passive component learning media program was declared valid and could be used as a learning medium. From the values obtained, this program can be used in the passive component material of RLC with the concepts that have been presented by this program.

As an implication of this research, it has been obtained that the passive component learning media RLC can be developed to improve the quality of learning the RLC passive component concept in SMK. This acquisition is considered to have a good meaning considering the lack of learning media owned by the school and the teacher itself.

In this research, there are still some aspects that have not been assessed by the media itself. The drawback of this learning media is that you have to install the Borland Delphi 7 application first. Lack of supporting sound facilities. Color design and images are still less attractive. In the future, other aspects can be included, such as an assessment of the design aspects of the media features themselves and other aspects.

This is expected to strengthen the media itself as a good learning medium in the learning process in schools. From this research, it is hoped that there will be motivational boosters for education practitioners to increase their participation in overcoming the limitations of other educational facilities.

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