DEVELOPMENT MEDIA INTERACTIVE LEARNING TO PRACTICE THE ELECTRICAL SYSTEM FOR CAR SMK (CASE STUDY WORKS SMK KARYA BHAKTI PUSDIKPAL)

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Abstract

Adapting Light Vehicle Engineering at SMK KB PUSDIKPAL have a few issues. Taking into account the meeting with Mr. Rochmat Santoso, S.ST as light vehicle building instructor expressed that understudies who once in a while looks exhausted with the method for introducing material that educators give in the classroom. In the domain of practice are regularly mishaps that brought about an instrument - a reasonable device in the workshop gets to be harmed.

The accessibility of PCs in schools must have the capacity to bolster the learning procedure. The condition can be fulfilled by the presence of an answer is to construct an intelligent learning media in designing light vehicles to rehearse the auto's electrical framework. Assessment of the material by utilizing recreation as a part of this instructional media can be an option learning on the grounds.

Keywords: Media Education, Light Vehicle Engineering, Simulation

1. Introduction

Auto electrical practice is one of the capabilities that exist in professional schools (SMK), which opened the bureau of building of light vehicles. SMK KB PUSDIKPAL is a school that will be the object of this study in light of the fact that SMK KB PUSDIKPAL is one of the schools that opened light vehicle building system, in professional KB PUSDIKPAL there are three offices, to be specific: Light Vehicle Engineering, Electrical Engineering and Mechanical Engineering. This examination was directed on stand out region of expertise is the field of aptitude Lightweight Vehicle Engineering ,.

In view of meetings with instructors Lightweight Vehicle Engineering at SMK Karya Bhakti Pusdikpal, Rochmat Santoso, S.ST said that the learning procedure is still fixated on the educator. So educators survey, that the understudies were soaked if each study simply duplicating from the writing board. Parties educators additionally take a stab at figuring out how to utilize force point, yet devices, for example, infokus gave a set number of schools. Yet make greatest utilization them conversely on the grounds that the learning procedure. Impediments regularly happens is in the domain of practice. As per him, the successive event of slips in the domain of practice that brought about an apparatus - an instrument that is in the workshop gets to be harmed. The rate of missteps was more than half. SMK Karya Bhakti Pusdikpal itself has a PC lab, there are around 25 gadgets of PCs. Yet, in the lab don't have web system.

Car power is one of the essential lessons to learn electrical autos. Hence the mix-ups made ought to be as negligible as could be expected under the circumstances to maintain a strategic distance from harm. With the goal that understudies can better comprehend what they realize, in this manner a PC helped learning media is made. PBK it is a PC application as a necessary piece of the learning framework for showing and learning procedure which expect to help understudies in learning can be through an example of two-way connection by means of work stations and multi-course extended over a PC system. Application is made pembelajran intelligent media for reproducing practice exercises for the electrical framework in the auto lighter vehicles designing field. By method for intelligent media as reproduction is the media that joins a progression of pictures, content and sound with the goal that they can better imagine the lessons, the learning procedure is relied upon to have the capacity to feel more appealing, in the meantime understudies can likewise collaborate in these subjects. A representation can likewise be utilized as an intends to bolster that content/long story can be more alluring so that the data will be simpler to learn and recollect. Because of the PC lab does not have the Internet then be made electronic application is made intranet. Intranet web aims here just utilized as a customer server to the school. To manage these

issues was made "Media Interactive Learning To Practice For SMK Car Electrical System".

2. The contents of research

2.1 System Analysis

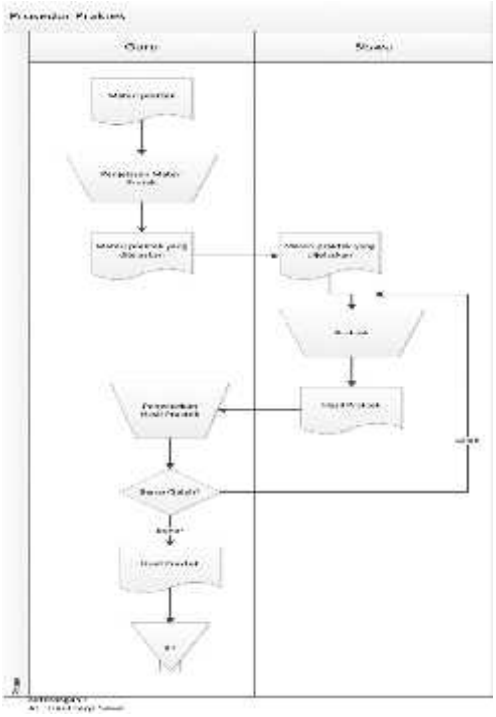
Analysis the decipherment of a system can be defined as of a system the parts whole into its components with a view to identify and evaluate the needs expected so as to be proposed improvement -- improvement

2.2 The analysis procedure that is currently running

The analysis procedure is a procedure to analyze activity - working procedures that occur on the running system. Results of this analysis the activities of a real picture of the sequence of the activities of the learning process carried out by teachers and students in vocational practice in the car electrical KB Pusdikpal.

Flowmap automotive electrical lab activities can be seen in the picture 3.1, while the flow of the procedure is as follows:

a. The teacher explains the contents of practice material to the students.
b. Students receive practice material described by the teacher.
c. Students practice.
d. If students have completed the practice, the results of the practice given to teachers for the next rated and allowed to continue with the practice of the material to the next. If the student has not completed the practice continued practice next week and should not proceed to the next practice material.



Picture 1 procedure that is currently running

2.3 Analysis of a problem

Analysis of the problem is the first step that must be done in the stage of system analysis. Problems can be defined as a question which is desired to be solved. Therefore, the first step that must be done at this stage is to identify in advance the problems that occur. Based on the analysis of the problem that has been done, there are several issues, namely:

1. Students who sometimes feel bored with the way of presenting the material in class.
2. An error occurred in the realm of practice in the workshop.

2.4 Media analysis learning using simulated built

Instructional media using a simulated media that contains learning materials on the car electrical therein. Learning media is intended for vocational high school students. The main objective of this study is interesting media have students in terms of electrical cars and reduce accidents that occur during practice at workshops.

2.5 Learning Media Descriptions Of Automotive Field Simulation

Car electrical simulation learning media is a web-based learning media intranet, which contains material and simulation of electrical practices for class X car. The material presented in this study is the material media installation, test and repair electrical

car is equipped with a dish of 2D graphics, interactive simulations so that students are more interested in the learning process so that a better understanding of the material being studied

2.6 Analysis of the material

Analysis of the material use of simulation in the automotive electric learning media will be described based on each material relating namely; Installation material electrical system, the electrical system Testing, Repair and security systems and components. Analysis of the material to be built can be seen in Table 1.

Table 1 analysis of the material

Materi	Standar Siswa	Objek
Pemasangan Sistem Kelistrikan	1. Siswa memasang rangkaian komponen komponen yang diperlukan. 2. Siswa memasang perlatan kelistrikan pada kendaraan tersebut	Siswa mampu mengetahui cara memasang dengan benar komponen pada mobil
Pengujian Sistem Kelistrikan	1. Siswa mengaji rangkaian yang sudah dipasangkan tadi 2. Siswa menganalisa penggunaan yang sesuai pada sistem pengujian/komponen kelistrikan mobil, penggunaan dan hasil diagnosis	Siswa mampu mengaji sistem pemasangan dengan menggunakan berbagai sumber untuk menganalisa, prosedur dan instrumen
Perbaikan Sistem pengecekan dan komponen kelistrikan	1. Siswa mengecek rangkaian yang sesuai berdasarkan tabel 2. Siswa menggambil komponen komponen dengan yang rusak dengan perbaikan 3. Siswa melakukan pengecekan kembali komponen komponen yang diperbaiki	Siswa mempunyai ketampilan dalam melakukan perbaikan sistem pemasangan dan setiap pengujian yang ada dalam kendaraan

2.7 Specifications software needs

Systems and software design and identification system involving deksripsi abstarksi hubungan-hubungannya basic and software.The functional in design and design non-fungsional.Based on the rule, the business the specifics of that system software needs to be built in table 2 is as follows

Table 2 specifications software needs

No	Kode	Deskripsi Kebutuhan
1	SSPC-F-01	Sistem dapat menampilkan materi pelajaran yang dipilih
2	SSPC-F-02	Sistem dapat menampilkan animasi materi pelajaran yang dipilih
3	SSPC-F-03	Sistem dapat menampilkan evaluasi materi berupa soal-soal pilihan dan materi lainnya
4	SSPC-F-04	Sistem dapat menampilkan jawaban evaluasi
5	SSPC-F-05	Sistem dapat menampilkan nilai dari soal yang telah evaluasi
6	SSPC-F-06	Sistem yang dibangun berbasis web
7	SSPC-F-07	Antarmuka pengguna menggunakan Bahasa Indonesia
8	SSPC-F-08	Untuk menjalankan sistem yang dibangun maka dibutuhkan Mozilla Firefox

2.8 Analysis non functional needs

Non-fungsional analysis is analysis needed to specifying system needs .This specifications also includes elements or component parts what is required to a system which will be built up to the system implemented .Analysis this need also specifying the input that output system deals to be delivered systems and processes required to cultivate input so as to produce a desired output .In the analysis needs non-fungsional system is noted needs analysis software , an analysis of the needs of hardware , and analysis users

2.8.1 An analysis of the needs of hardware

Hardware contained in SMK KB PUSDIKPAL can be seen in Table 3 and the hardware needed to run the application can be seen in Table 4.

Table 3 specifications hardware available in vocational scool KB PUSDIKPAL

No	Perangkat Keras	Spesifikasi
1	Prosesor	Prosesor dengan kecepatan 2.00 GHz
2	Memory	RAM 1 GB
3	Monitor	Monitor dengan resolusi 1024 x 768 pixel
4	Graphic Card	512 MB
5	Harddisk	80 GB
6	Peralatan Pendukung	Papan kunci (keyboard), tetikus (mouse), dan monitor

Table 4 needs specifications hardware needed

No	Perangkat Keras	Spesifikasi
1	Prosesor	Prosesor dengan kecepatan minimum 1.4 GHz
2	Memory	RAM minimum 512 MB
3	Monitor	Monitor dengan resolusi minimum 1024 x 768 pixel
4	Graphic Card	VGA minimum 256 MB
5	Harddisk	Free Space minimum 100 MB
6	Peralatan Pendukung	Papan kunci (keyboard), tetikus (mouse), dan monitor

2.8.2 Needs analysis software

Needs software available at SMK KB PUSDIKPAL can be seen in Table 5 and the software needed to run applications Electrical Drives learning media can be seen in Table 6.

Table 5 specifications software available in vocational school KB PUSDIKPAL

No	Perangkat Lunak	Spesifikasi
1	Sistem Operasi	Microsoft Windows 7
2	Tools Compiler	Adobe Flash Player 14

Table 6 software specifications required

No	Perangkat Lunak	Spesifikasi
1	Sistem Operasi	Microsoft Windows 7
2	Tool Pembangun	Adobe Flash CS5
3	Tools Design	Adobe Photoshop
4	Tools Compiler	Adobe Flash Player 15
5	Tools Browser	Google Chrome

2.9 An analysis of the needs of users

User analysis is an analysis of the users who will use the applications that have been built. The users of this application is a student majoring in Lightweight Vehicle Engineering at SMK KB PUSDIKPAL, students who will be using this application are given training or guidance on the procedure for using the car electrical applications instructional media is that students are able to run this application properly.

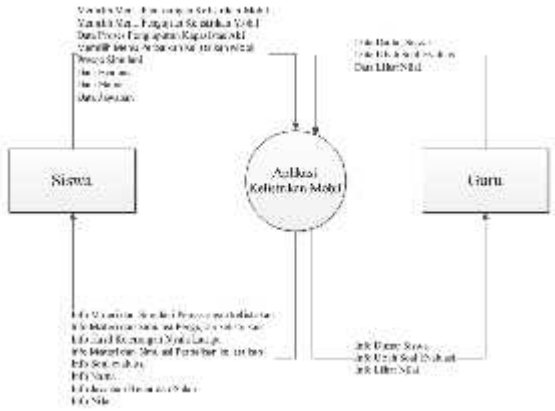
2.10 Analysis of the function

The analysis of the function of the system will be applied to a necessary and that the system needs to be well as in accordance with needs.Modeling

modeled by means of diagrams (dfd data flow) and the dictionary.

2.11 DFD (Data Flow Diagram)

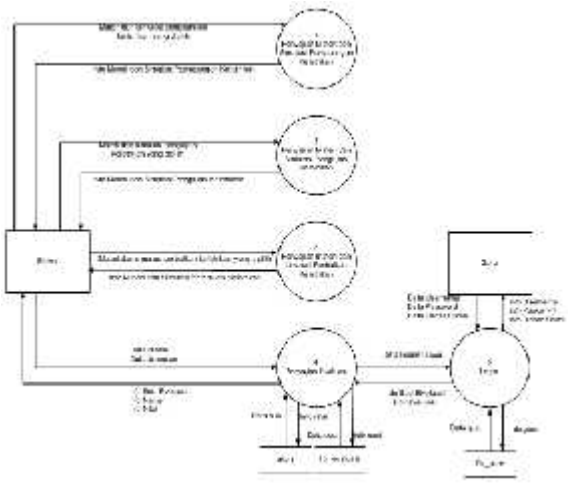
Data Flow Diagram is a medium that is used to describe the flow of data that flows on an information system. In the Data Flow Diagrams (DFD) consist of external entities, data flow, and data storage processes. Here is the DFD of car electrical instructional media. Besides DFD context diagram used also tools, context diagram itself is a diagram illustrating the input, process and output of the software system to be built. The following diagram context of instructional media electrical automobile, can be seen picture 2.



Picture 2 Diagram Konteks

2.11.1 DFD Level 1

DFD Level 1 describes the entire functionality that can be done on the car electrical instructional media, which can be seen picture 3.



Picture 3 DFD Level 1

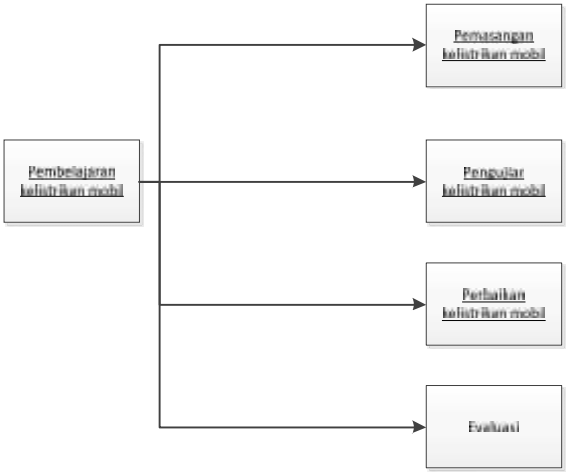
2.12 System design

Design is a section of methodology of development a software that will be done after stage to give a description in detail , after going through phases of analysis .In order to make design the system then done several steps that is as:

1 .Menu design structure
2 .Kind of user interface design
3 .Design a message
4 .Semantic tissue
5 .Procedural design

2.12.1 Menu design the structure

The design of the menu structure is the description of the flow of applications so that application usage is easy to understand and easy to use. The design of the menu structure of the car electrical learning media can be seen picture 4.



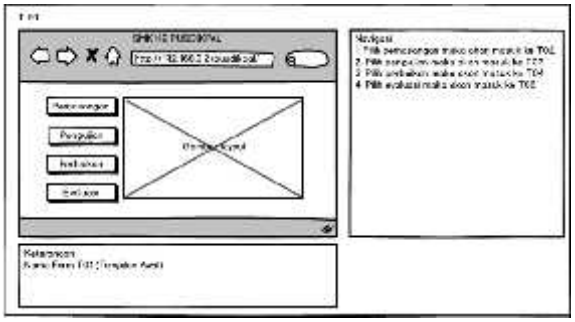
Picture 4 menu design structure media electrical automobile

2.12.2 Interface design

Interface design aims to provide an illustration of the application of which will be built , so that will facilitate the application in implement and simplify the design among making advance that easily used by the user system .This design implemented into a program that intact and can be used by the user system.

2.12.2.1 Menu design of material

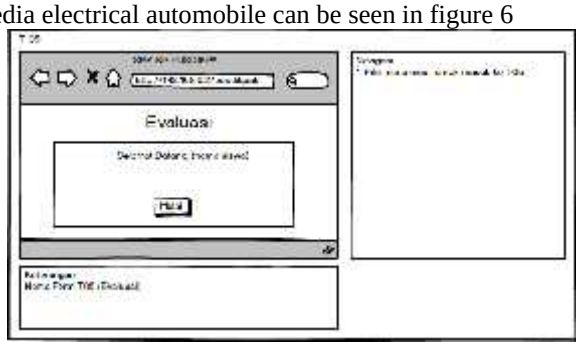
Interfaces for menu design matter in the media for the repair of learning the field of electrical automobile can be seen from figure 5 .



Picture 5 Menu design of material

2.12.2.2 Menu design of evaluation

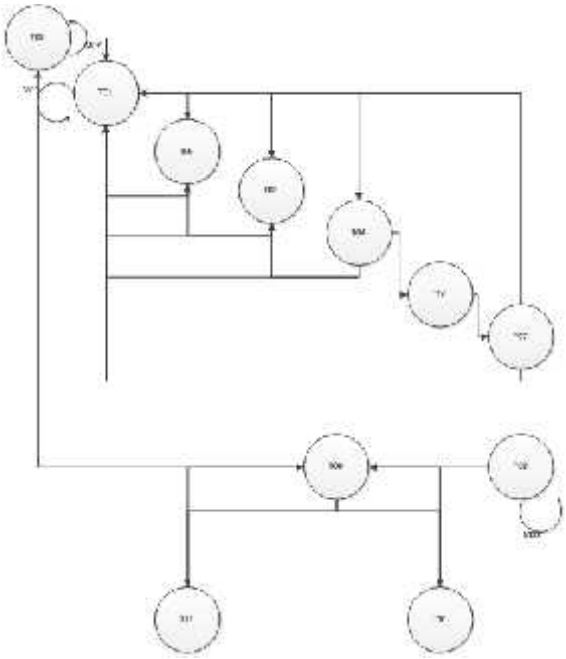
Menu design interfaces for charging the identity of evaluation in the media for the repair of learning media electrical automobile can be seen in figure 6



Picture 6 menu drafting of evaluation

2.12.3 Semantic network

The application described the structure in detail with made into small modul-modul who easily made , easily tested , and easily modified .In .Making this application using chart structural assistance which is called also a network of semantics .Semantic tissue that describe the structure in this application described in figure 7.



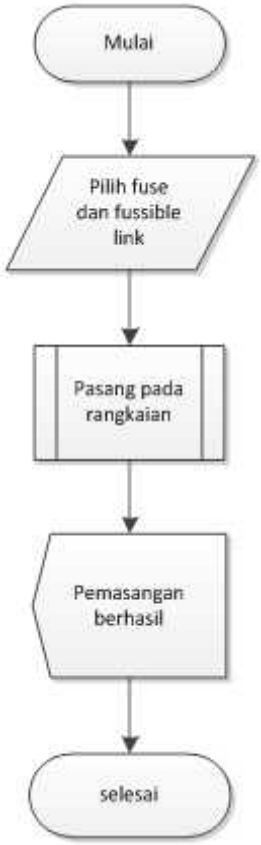
Picture 7 Semantic network

2.12.4 Procedural design

Prosedural and used to determine the steps or by any process in which a system.The following is to be built from the prosedural.

2.12.4.1 Design Procedural For Electrical Installation Simulation Cars

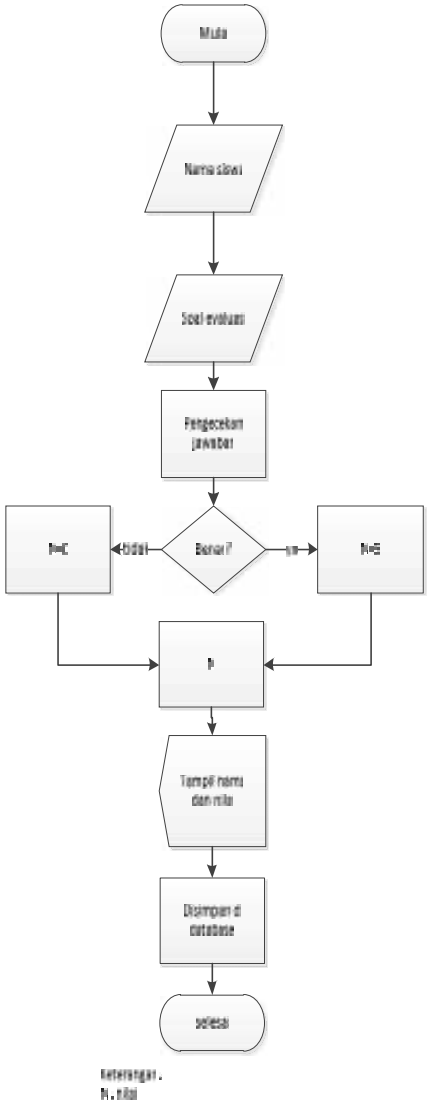
Designing for Process Simulation procedural improvements to the car's electrical system can be seen in the picture 8.



Picture 3.8 flowchart to simulation process of painting

2.12.4.2 Procedural design evaluation

Evaluation for procedural design for the car's electrical system can be seen in the picture 9



Picture 9 flowchart for evaluation

2.13Implementation

Translation is part of the implementation of a system design into a based on the analysis of a particular programming language as well as the application of software that was built in a real environment .The purpose is to confirm the implementation program that has been designed on the principals the system so that the users to provide input to the developer system .The implementation of this system will explain who the needs of the hardware and software used.

2.13.1 The implementation of the application

Application-based car electrical Learning Media is comprised of training and testing of electrical materials in the subject car. This application does not need to be installed, simply copy the folder containing the application, and then installed on the servers, for access by the client. With conditions on the Windows operating system must be installed Adobe Flash

Player 12, mozilla firefox or google chrome browser and XAMPP as database storage media in order for the application of this learning media can be run. If Adobe Flash Player 12 and Adobe Flash CS5.5 is not installed, then the Learning Media can not be executed because the file on this application .swf extension that will be able to walk with support for Adobe Flash Player 15 on mozilla firefox and google chrome.

2.14 testing system

Testing this system is most important stage done to find a deficiency or errors at software that tested .Testing aims to reveal software that made already fulfilled the criteria appropriate .Tests carried out which is testing the black box and beta testing.

2.14.1 Pengujian Black Box

In the functional testing phase used is intended to test the new system is to use black box testing. Black box testing focuses on functional requirements of software consisting of test plans and test case results.

2.14 Beta Testing

Beta testing is testing conducted objectively. Beta testing is done by testing directly in the research conducted in the vocational KB PUSDIKPAL aims to determine the extent to which the system is built to be an alternative medium of learning. Beta testing is done by giving questionnaires to 35 students of class X SMK Light Vehicle Engineering Department and interviews with Master Light Vehicle Engineering, Rochmat Santoso, S.ST testing technique used in this beta testing is a technique Likert scale.

On every question existing in kuisioner will get point different assessments .The following table point judgment can be seen in table 7.

Table 7 point assessment

Jawaban	Point Penilaian
Sangat Setuju	5
Setuju	4
Ragu-Ragu	3
Tidak Setuju	2
Sangat Tidak Sejutu	1

3. finality

3.1 conclusion

Based on the results of the implementation and testing that has been done in vocational KB PUSDIKPAL, the conclusions of this study as follows: Based on the results of the study are intended as a tool to support the students in the case of electricity the car could be concluded as follows.

1. This learning media to attract enough students to learn about electrical cars.
2. This learning media has not been able to reduce errors during practice at workshops.

3.2 Suggestion

In the construction of the Media Learning Using this simulation may be felt still many shortcomings. Therefore, it is necessary to do further development and refinement in order to meet the needs of the users are increasing. The suggestions for the development of instructional media, namely:

1. The addition of X-grade material to complete the second half of this learning media.
2. Added a sound effect to make it more attractive.

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