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E-Jobsheet in Power Electronics Practicum Course

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ABSTRACT

The purpose of this research is to produce an e-Jobsheet on Power Electronics Practicum that is valid, practical, and effective for electrical engineering students at the Padang State University. The research method used is research and development. The findings of this study are that this research has succeeded in developing an e-jobsheet in the Power Electronics Practicum that has been developed effectively, judging by the cognitive and psychomotor learning outcomes of students. Based on the difference between the results of the pretest and posttest, it can be concluded that e-joobheet has been effective. The implication of this research is that the e-Jobsheet can be used by lecturers in the Power Electronics Practicum course at the Department of Electrical Engineering, Padang State University.

Keywords: Effectiveness, E-Jobsheet, Electronics Practicum

1. INTRODUCTION

The development of digital technology is very fast, especially in the world of education. Many applications are made to support the learning process or even become part of the learning itself, such as the teacher's room, coding and so on. Seeing the development of the world of education which is very fast to produce various new branches of knowledge. There are several branches of science that have not been touched by technology in the application of the learning process. And the focus of this researcher is on the use of digital technology in the power electronics practicum learning process for electrical engineering students at the Padang State University.

Power Electronics Practicum is one of the mandatory courses in the Electrical Engineering department. Power Electronics Practicum course learns about how electricity can be changed and adapted to the needs. Electrical engineering students who take this course will be taught how to use electrical conversion tools and use applications for circuit simulations. One of the difficulties experienced by electrical engineering students in the learning process is the worksheets that are always left behind or lost. In addition, the material provided is also felt to be lacking and tutorials are rarely given, making students often have difficulty understanding learning and often experience delays in working on power electronics practicums.

Power Electronics Practicum e-jobsheet is an e-Jobsheet created to help students and lecturers in the learning process. This e jobsheet was made with reading materials for students related to Power Electronics, a Power Electronics Practicum jobsheet and also a short video about the process of assembling components and the installation design process using supporting applications such as PSIM. With this application, it is expected to facilitate the learning process in the classroom or in the laboratory. So that the learning process is maximized and can be completed on time.

This study aims to design an e Jobsheet application in the Power Electronics Practicum course. The design carried out is to adjust the features in the e-jobsheet application to the needs of electrical engineering students at the Padang State University.

2. EXPERIMENTAL

The research uses the Four-D development model. The Four D model is a suitable model for research, where this activity starts from analyzing the problem in the background of the problem. The activity is in the form of observation/observation and concludes several events that appear in the formulation of the problem.

In the later research, treatment will be given to the experimental class and no treatment (treatment) to the control class. Data collection was assisted by distributing instruments in the form of questions to electrical engineering students who took the Power Electronics Practicum course to assess cognitive aspects.

The source of data in this study is primary data obtained from students taken through the effectiveness of the developed E-joobsheet. The research subjects are electrical engineering students, totaling 30 people. The sampling technique used is purposive sampling, namely sampling according to the needs of the researcher. The data analysis of the effectiveness of the e-learning module was carried out by using the t test.

3. RESULTS AND DISCUSSION

The development of E-Joobsheets in the Power Electronics practicum course is an activity carried out to produce valid, practical and effective E-Joobsheets. In the first stage, define is the process of analyzing students and the curriculum in the power electronics practicum. In the next stage, the design is the design of the e-joobsheet which is adapted to the jobsheet from the lecturer in Power Electronics Practicum at the Faculty of Engineering, Padang State University. The main activities at this stage are writing, reviewing and editing the Power Electronics Practicum E joobsheet by paying attention to language, word order, format, purpose, evaluation and pictures, video and audio. The following e-joobsheet design will be developed:

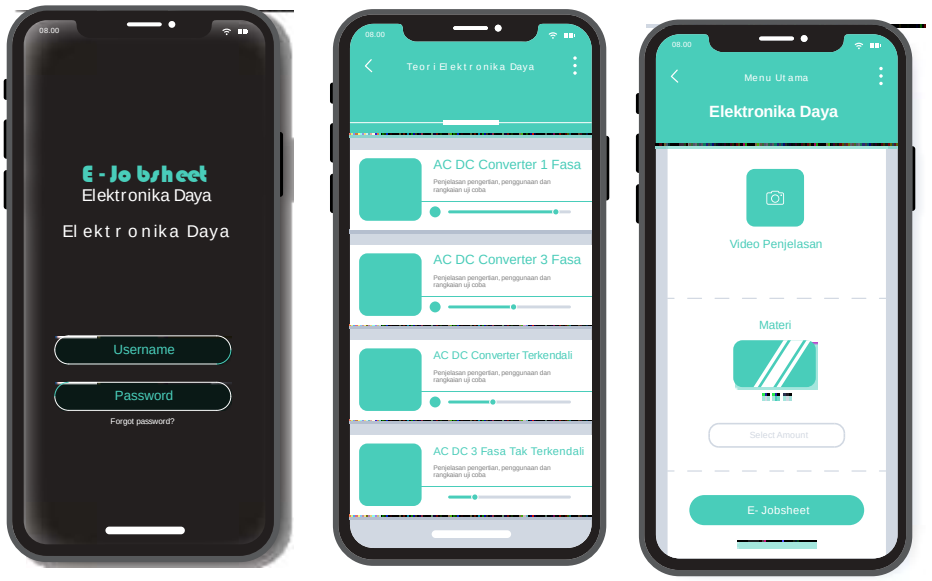

Figure 1. E-Jobsheet Aplication

The design of the front page contains the title of the Power Electronics Practicum e joobsheet. And go straight to the main menu. The main menu consists of Material, Jobsheet and video menu options. The results of testing the effectiveness of e-joobsheets consist of normality, homogeneity and hypothesis testing. And in the third stage, namely develop, namely the development of e-joobsheets in accordance with revisions or suggestions from the validator in order to get an effective module.

Normality test is conducted to test whether the data is normally distributed/not. The results of the normality test are: the normality value of the pre-test data is 0.107. The normality value is greater than the significance value (0.107>0.05) if this value is reached, it is said to be normally distributed. Furthermore, the normality value of the post-test data was obtained at 0.267, the normality value was greater than the significance value (0.267 > 0.05) so that the data was declared normally distributed. After the data is declared normal, it is continued with the homogeneity test which is a test to find out whether the two data obtained from the two groups have the same variance or vice versa. have the same variance (homogeneous).

Furthermore, hypothesis testing was carried out with t-test. Obtained a significance value of 0.000, which means the value of sig.0.000 < 0.05, then there is a significant difference in the learning outcomes of students before and after using the e-joobsheet. Effectiveness testing is also carried out using the effect size formula.

Based on the test, the results obtained are 0.6 with a medium category, meaning that the effect of using e-jobsheets in the Power Electronics Practice course has a medium category. The effectiveness test was conducted to see the impact of the use of e-joobsheets for Practicum Electrical Power. The effectiveness results were seen based on the differences in the results of the pre-test and posttest to see the significance value between the learning outcomes before using the e-joobsheet and the learning outcomes after using the e-joobsheet.

Based on the analysis carried out at the effectiveness test stage, it proves that the use of e-joobsheets in the power electronics practicum process can help electrical engineering students at the Padang State University to understand the material faster so that they can complete the given practicum more quickly. Furthermore, in the last stage, what is done is disseminate or the process of spreading the e-joobsheet that has been made. The requirements for deployment are when the created e-joobsheet has been declared valid, practical and effective.

4. CONCLUSION

Based on the results of the study, several conclusions were obtained, namely: (1) This study produced an E-Jobsheet for the Electrical Power Installation Practice Course. The contents of the created E Jobsheet consist of text, images, and videos. E-Jobsheets that are made based on applications which can later be accessed offline to read materials and jobsheets, but videos are made online to reduce the burden of installing applications. (2) Research produces an effective E-Jobsheet. The effectiveness of the E-Jobsheet is seen based on the cognitive and psychomotor learning outcomes of students in conducting practicals, which are categorized as effective. (3) Cognitive learning outcomes of students are seen based on the value of completeness with the percentage categorized as effective. Based on the difference in the results of the pretest and posttest, it obtained a low significant value so that it was declared effective. Based on the magnitude of the impact of the use of E-Jobsheet, it gives a high effect value. Based on the psychomotor value, the results of the practice of students achieve completeness scores. This means that e-Jobsheet is said to be effective judging from the psychomotor aspect of students when carrying out practicum activities. The results of developing a valid E-Jobsheet can be used by Lecturers in carrying out their learning process because the e-module developed is in accordance with learning outcomes in the 2013 curriculum.

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