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DIFFERENCES OF LEARNING OUTCOMES OF MICROCONTROLLER PRACTICES USING MICROCONTROLLER MCS51 TRAINING KIT

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ABSTRACT

This paper describes the differences in learning outcomes in the practice of Microcontroller System using MCS51 Microcontroller Trainer. The MCS51 microcontroller Trainer is tested to Electronics Engineering students who are studying in practice of Microcontroller System. The research method used is quasi experimental. The experimental class uses the MCS51 Microcontroller Trainer Kit as a medium, then the control class using a self-assembled circuit on the Project Board. The results show that the learning outcomes of the expriment class is better than the control class.

Keyword*: MCS51 Microcontroller Trainer Kit, Quasi Eksperimental*

INTISARI

Artikel ini memaparkan perbedaan Hasil Belajar dalam praktek Sistem Mikrokontroler menggunakan Trainer Microcontroller MCS51. Trainer Mikrokontroler MCS51 digunakan untuk mahasiswa Teknik Elektronika yang sedang mempelajari praktik Sistem Mikrokontroler. Metode penelitian yang digunakan adalah eksperimen semu (Quasi Experimental). Kelas eksperimen menggunakan Trainer Kit Microcontroller MCS51 sebagai media media pembelajaran sedangkan kelas kontrol menggunakan sirkuit rakitan pada project board. Hasil penelitian menunjukkan bahwa hasil belajar dari kelas experiment lebih baik daripada kelas kontrol.

Kata Kunci: Trainer Kit Microcontroler MCS51, Quasi Eksperimental

PENDAHULUAN

In this article is discussed about determining differences in learning outcomes that occur if media MCS51 Trainer Kit Microcontroller used in learning Microcontroller System. The research was conducted in the class of practice of Microcontroller System at the Department of Electronic Engineering, Universitas Negeri Padang in the even semester of academic year 2013/2014.

Trainer Kit Microcontroller MCS51 is a learning media that can simulate various display programs that can be done by microcontroller system [1][2]. In relation to Nesbit's simulated learning in Joyce, Weil & Calhoun states that: "Simulations can stimulate learning about: 1) competition; 2) cooperation; 3) empathy; 4) social system; 5) concepts; 6) skill; 7) efficacy; 8) serving a sentence; 9) the role of opportunity / opportunity; 10) the ability to think critically ". Simulation learning can create healthy competition among students who practice a competency. Students can be more creative and enthusiastic and more motivated because they compete to get better results. If any of the students are left behind the training material will be able to try to catch up at other times. Students are also trained to work together well to work on an activity by working on sub-activities, the results of which can be synergized during the simulation. If there are students who are late doing work or even deadlocked in conducting simulations it can be helped by demonstrations from other participants. If there are friends who have not finished working on their simulation practice assignments they have to wait for the other participants to finish, because the results of the exercise must be collected in complete groups. Simulation learning can also arouse empathy for students who are learning. Thus simulation learning can also train students in social interaction.

Scientific concepts can be developed well after students participate in the learning process to simulate the program. By doing repetitive simulations, the more learning experiences students have gathered, the better understanding of the concepts they learn [3]. Learning simulation programs using a microcontroller trainer can also train the skills possessed by students who are learning, through habituation (behaviorism) because it is done repeatedly. Obstacles experienced by students in conducting simulation practices can originate from errors in the program caused by writing errors (errors in syntactic writing). Students who are familiar with the difficulties encountered in the practice of this simulation will always try to get a way out. Such habits will be able to shape their skills better [4] [5] [6].

PENDEKATAN PEMECAHAN MASALAH

Method

The research method used is quasi experimental. In this study the research subjects were divided into 2 classes, namely the experimental class and the control class. In the experimental class taught using a microcontroller Trainer in the practice learning paroses. Another case in the control class using the project board in the practice of microcontrollers. After the practice process was carried out eight times the learning outcomes test was carried out. Learning outcomes tests were analyzed to obtain differences in learning outcomes between the two between the two groups.

HASIL DAN PEMBAHASAN

Image 1 shows the results of the study, where the learning outcomes of the experimental group and the control group are displayed in tandem. Thus it can be clearly seen the difference in learning outcomes of the two groups. Multivariate analysis is used to test hypotheses.

EXPERIMENT GROUP			CONTROL GROUP		
Resp.	Using Trainer (0/1)	Competences	Resp	Not use Trainer (0/1)	Competences
1	1	4.027	1	0	3.272
2	1	2.862	2	0	3.406
3	1	3.731	3	0	3.528
4	1	3.346	4	0	3.384
5	1	2.025	5	0	3.906
6	1	4.027	6	0	3.328
7	1	4.415	7	0	3.15
8	1	3.923	8	0	3.506
9	1	3.927	9	0	3.984
10	1	3.919	10	0	3.784
11	1	2.862	11	0	2.972
12	1	3.350	12	0	3.272
13	1	3.246	13	0	2.828
14	1	3.442	14	0	2.972
15	1	3.35	15	0	2.828
16	1	3.731			

Image 1. Learning Outcomes

The analysis was done through the SPSS. The results of analysis such as Table 3. Descriptive Statistics. The average for each variable was tested in the experimental group with an control group be compared such as Image 2. The Higher average variables indicate better groups for the variables tested. The experimental group had an average learning outcome of 3.708 higher than the average of the control group's learning outcomes of only 3.446. Thus it can be said that learning using a microcontroller trainer is better than using a project board.

Descriptive Statistics				
GROUP	VARIABEL_X	Mean	Std. Deviation	N
CONROL GROUP	Total	3.445923	5027442	30
EXPERIMENT GROUP	Total	3.708778	4473527	32
Total	Total	3.581590	.489286 5	62

Image 2. Descriptive Statistic

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KESIMPULAN

The results of learning the practice of a microcontroller system using a microcontroller trainer media is better than the results of learning the practice of a microcontroller system that uses a project board media.

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