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Abstract. The purpose of this study was to determine the interaction of learning media Electronic Circuit based on Livewire Software to improve the study result and creative thinking of students. This research method used Experimental Method with pretest-postest control group design. The sampling of procedure used cluster sampling technique consisted of A class as experiment class as much as 17 students. The data collection techniques used, documentation, questionnaires, and tests. Statistical analysis in this study used t-test analysis to find the interaction of application of learning media Electronic Circuit.based on Livewire Software to improve the study result and creative thinking. The results showed that the value of t-test was 8.462 to study result and the value of t-test was 12,675 to creative thinking students. The t-table means that there was an interaction of application of learning media Electronic Sircuit based on Livewire Software to improve the study result and creative thinking. The t-table of 1.745 with a significance level of 5% indicates that the value of t-test was greater than t-table, it means that there was an interaction of learning media Electronic Sircuit based on Livewire Software to improve the study result and creative thinking of students.

1. Introduction

Starting from a learning process that seemed unattractive, it seemed to saturate, so that students could not study too long in the classroom, students lacked enthusiasm and were unable to absorb the material properly, so this study with the title "The Analysis Interaction of Learning Media Electronic Circuits Based on Livewire Software to Improve Study Result and Creative Thinking" was realized as an effort to improve teaching and learning in the classroom. Hamalik suggests that communication relations will run smoothly with maximum results when using a tool called communication media [1]. There have been many innovations in teaching and learning that have been implemented, ranging from learning in classrooms that are comfortable to learning in the open by utilizing whatever is in the environment, learning processes that are outcame-based / products that use the development of modern software-based technology. Gagne and Briggs implicitly say that learning media includes tools that are physically used to convey the contents of teaching subjects, which consist of books, tape recorders, tapes, video cameras, video recorders, films, slides (picture frame), photos, pictures, graphics, television, and computers [2]. Software is time to be optimized to improve the quality of a learning process. It is intended that the learning process can be interesting and can improve students' understanding and creativity. Contextual learning is an attempt to change students to be active in their own abilities that are fortunate in terms of benefits, because students try to learn ideas while applying and linking them to the real world [3]. Based

on the results of observations, researchers found that learning outcomes were quite low and the students' creative thinking abilities were low.

Responding to the problems above it is necessary to have a learning model that can create student involvement in the teaching and learning process to develop students' creative thinking skills. Getting used to working scientifically is expected to foster habits of thinking and acting that reflect, mastery, knowledge, skills, scientific attitudes, and of course produce work, so that the learning model itself will result in increased knowledge, abilities, scientific attitudes, and can produce works as a result learn. Based on these problems, the researchers conveyed the idea of using the Livewire Software program as a learning media for electric lighting installations as a means for simulation and analysis for students of the Electrical Engineering Education program more varied and creative. Livewire is a program that is an electronic simulation that is used to design to analyze, displayed in an animated form to demonstrate the basic functions or principles of electronic circuits. This Livewire is a computer laboratory. This simulator is very suitable for use in electrical lighting installation courses, because it is used to simulate electronic circuits. There are many electronic components that can be used on livewire such as resistors, capacitors, ampere meters, dc voltage sources, ac voltage sources, and others.

This simulator can be combined with power points, macromedia flas, swis max, and the others. Putri [4] Development of Power Point-Based Physics Learning Media with the Help of Livewire Software in the Material of Direct Electric Current Circuits. The results of the research that have been achieved are able to make learning media for physics lessons using power point with the help of Livewire Software so that it can attract students' interest in learning lessons in the Continuous Electric Current. In line with the research carried out, livewire software is a learning medium which is one of its goals to improve students' creative thinking skills. Creativity is the result of learning in cognitive skills, so to be creative can be learned through the teaching and learning process [5]. Creative thinking is an activity in observing, deciding, and solving a problem correctly and innovatively. The ability to think creatively also emphasizes making decisions about alternative answers that are true, correct, and innovative. From the above, this research has clear objectives is the interaction of learning media Electronic Circuit based on Livewire Software to improve the study result and creative thinking of students

2. Research method

2.1. Stages of research

The research phase refers to Gravemeijer and Cobb [6] which consists of: Preparing for the experiment (research preparation) covers: 1) determine the place of research, 2) set of library research. Design experiment (implementation of experimental design) covers: 1) choose the research design,2) determine population and choose sample, 3) determine of hipotesis. Retrospective analysis covers analysis of data obtained from the previous stage.

2.2. Research sites and population

This research was conducted in Program Studi Pendidikan Teknik Elektro Fakultas Keguruan Dan Ilmu Pendidikan Universitas PGRI Madiun.The population in this study were 5 (five) semester students in the Program Study of Electrical Engineering Education. The sample taken consisted of 17 students as an experimental class. The sampling procedure in this study uses purposive sampling technique. In its application, all students have the same opportunities to be studied. Based on the questionnaire instrument distributed to 17 students, it was found that students still had difficulty understanding the material well, felt difficult to be able to apply in life every day, and it was still difficult to determine when to use appropriate and correct procedures in the teaching and learning process.

2.3. Research design

In this study, the approach used was an experimental study using the pretest-posttest Control Group design. The sampling procedure in this study uses purposive sampling technique. The sample of the research class / experimental class was treated using the livewire software-based media. After the

learning process in the experimental class is carried out, the average achievement value is calculated. The independent variable in this study is the application of electronic circuit learning media based on livewire software. While the dependent variable is learning outcomes and the ability to think creatively.

2.4. Data collection technique

Data collection technique is Documentation Method: In this study the documentation method is used to collect data on the value of students in semester 4 (four) of Electrical Engineering Education Study Program. This value is used as a reference to see equality in the making of research groups. Interview Method: Interviews are used to collect data on the use of learning media for education and students' views on the model applied.

Test Method: Test method is conducted on the knowledge aspect test instrument and critical thinking ability test. Taking the test scores used is a learning outcome test instrument in the form of multiple choice questions and tests of creative thinking skills in the form of essay and oral questions. After the instrument is given to students it can be obtained the score quickly, objectively and includes the material taught.

2.5. Data analysis technique

The analytical techniques used in this study are: Data Analysis Tests Learning Outcomes and Creative Thinking Ability. Analysis of test results data used to measure data on aspects of student knowledge obtained from pretest and posttest in the form of multiple choice questions. Pretest and posttest data of students were tested for normality and homogeneity as a prerequisite test of analysis.

The results of the prerequisite test are used as a basis for further testing using the t test on cognitive learning outcomes and students' creative thinking skills. The hypothesis proposed is that there is an influence of the use of electronic learning media based on livewire software on learning outcomes and students' creative thinking skills. The decision making criteria are: If the significance value is less than 0.05, H_0 is rejected. If the significance value is greater than 0.05, H_0 is accepted.

3. Research result

3.1. Student learning outcomes before treatment (pretest)

The results of the evaluation of the students of Electrical Engineering Education Semester 5 Academic Year 2016/2017 showed that the average learning outcomes of the Electronic Circuit course was still low (65.7). The pretest results from 17 students included 1 student in the poor category, 13 students in the sufficient category, and 3 students in the good category. The data shows that the learning process of the Electronic Circuit course is not optimal.

3.2. Student learning outcomes after treatment (posttest)

Data from the evaluation of students of Electrical Engineering Education semester 5 Academic Year 2016/2017 after being treated in the teaching and learning process using learning media Electronic circuits based on livewire software showed that the average learning outcomes of the Electronic Circuit subject was increased (85.4), This shows that there is a significant increase in the average value.

3.3. Results of creative thinking ability before treatment (pretest)

Data from the evaluation of the creative thinking ability of students of Electrical Engineering Education in the 5th semester of the 2016/2017 Academic Year shows that the average in the Electronic Circuit course is still in the sufficient category (72.0).

3.4. Results of creative thinking ability after treatment (posttest)

Data from the evaluation of the creative thinking ability of students of Electrical Engineering Education semester 5 Academic Year 2016/2017 after being treated in the teaching and learning process using learning media Electronic circuits based on livewire software showed that the average value of creative

thinking ability in the Electronic Circuit course was increased from 72.0 to 87.5, this shows that there is a significant increase in the average value.

4. Analysis

4.1. Normality test and homogeneity of learning outcomes

From the results of the normality test pretest student learning outcomes obtained L count of 0.187 with L table of 0.213 which indicates that L count is smaller than L table, meaning that the sample is normally distributed. Whereas for posttest, L count is 0.158 and L table is 0.213, then L count is smaller than L table, meaning that the sample is normally distributed. From the test of pretest and posttest homogeneity obtained F count 1.537 with F table 2,333. This shows that the calculated F is smaller than F table, meaning that the sample is homogeneous [7].

4.2. Normality test and homogeneity of creative thinking ability

From the results of the pretest normality test, students' creative thinking ability was obtained by L count of 0.157 with L table of 0.213 which shows that L count is smaller than L table, meaning that the sample is normally distributed. Whereas for posttest, it is obtained that L count is 0.149 and L table is 0.213 so L count is smaller than L table, meaning that the sample is normally distributed. From the pretest and posttest homogeneity test, it is obtained F count 1.755 with F table 2,333. This shows that the calculated F is smaller than F table, meaning that the sample is homogeneous [7].

4.3. T test for student learning results

From the results of the t test student learning outcomes obtained t count of 8.462 with t table of 1.745 which indicates that t count is greater than t table, meaning that there is an influence between methods with learning outcomes [8].

4.4. T test for student's creative thinking ability

From the results of the t-test the students 'creative thinking ability was obtained by counting 12.675 with t table of 1.745 which indicates that t count is greater than t table, meaning that there is an influence between methods with students' creative thinking skills [7].

5. Discussion

The results of the study and the results of the analysis show that the application of the use of livewire software-based learning media has a positive impact in improving learning outcomes. This can be seen in the increase in the average value of student learning outcomes and the results of statistical analysis which shows that t count is greater than t table, which means that there is a positive influence between the use of livewire software based electronic learning media on learning outcomes.

Cognitive learning outcomes based on independent samples test between experimental class and control class are very significant. Based on the average value of the experimental class has an average value of cognitive learning outcomes is higher than before treatment. This shows that the cognitive learning outcomes of students use electronic circuit learning media based on livewire software better. Apart from that the value of students 'creative thinking ability seems to have increased, this can be seen in the average value of the test of creative thinking ability after treatment becomes better and also from the results of statistical tests of students' creative thinking ability which shows that t count is greater than t table means that there is a positive influence on the use of livewire software based electronic learning media on students' creative thinking skills.

6. Conclusion

The results showed that the value of t-test was 8.462 to study result and the value of t-test was 12,675 to creative thinking students. The t-table means that there was an interaction of application of learning media Electronic Sircuit based on Livewire Software to improve the study result and creative thinking.

The t-table of 1.745 with a significance level of 5% indicates that the value of t-test was greater than t-table, it means that there was an interaction of learning media Electronic Sircuit based on Livewire Software to improve the study result and creative thinking of students.

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