The Effect Of Quizzes And Learning Activities Towards Students Learning Outcomes In Vocational Education of Electrical Circuits

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This study aimed to examine the effect of quizzes and learning activities on student learning outcomes in the electrical circuit courses. The approach taken in this study is an experiment. This study uses a research design with level 2 x 2. To get student learning outcomes carried out by tests, while to get student learning activities carried out by filling out instruments in the form of a Likert scale. The population in this study were all students who took electrical circuit courses in the second semester. The results showed that, (1) the learning outcomes of the electric circuit students who were given quizzes before the implementation of learning were higher than the students who were given the quiz after the implementation of learning, (2) there was an interaction between quizzes and learning activities on the learning outcomes) in groups of students who have high learning activities, the learning outcomes of electrical circuit subjects given quizzes before the implementation of learning are higher than students given quizzes after the implementation of learning, and (4) in the group of students who have low learning activities, learning outcomes students who were given quizzes before the implementation of learning were higher than students who were given a quiz after the implementation of learning.

Keywords: quizzes, learning activities, learning outcomes
1. INTRODUCTION

Technological advances have had a profound effect on the world of education. The use of these technologies in learning can motivate and inspire lecturers to design learning, while students can be used to study all the time. One of the uses of technology is the use of mobile phones.

Mobile is the most practical technology and can be carried anywhere. Today mobile phones are no longer a luxury item, and almost everyone of all ages has them. With a cellphone someone does not feel lonely, because it can be used anytime, and is always fun. With mobile phones the interest in reading the public in Jakarta, including students, is very high. Baswedan assessed that reading interest in the community is not low, but the reading power is actually low (Anies, 2007). The reading interest in question is reading on social media, while reading power is a person's ability to read books. From the data of the National Library in 2017, the average frequency of reading for Indonesians is only three to four times per week. While the number of books read on average is only five to nine books per year (Priska, 2018). Low reading power propagates also into the campus, if observed in student bags, few carry books related to lecture material or other books, they only carry just a notebook. The low readability of students, certainly has an impact on the knowledge they have. Based on experience, student learning outcomes from year to year continue to decline including the results of learning electrical circuits course.

Various ways have been done to improve student learning outcomes starting from the formation of group learning, and giving assignments, but have not shown good learning outcomes. The results of Wadjid's research on the use of cooperative learning models and the provision of structured assignments to the learning outcomes of electrical circuits course in electrical engineering education students have not yielded the expected results. Based on the research in the experimental class 23.08% which was included in the low category, 57.69% was included in the average category and 19.23% was included in the high category (Faried, 2017). In order for students to keep reading books, each end of the lesson is delivered a topic that must be learned. In certain groups of students will be given a quiz before the implementation of learning, while in other groups given a quiz after the implementation of learning takes place. With this learning model students will read books to prepare for the quiz that is conducted every time the learning. Answering the problems faced, the theories and results of relevant research will be explained.

The study of theory and the results of relevant research shows that learning outcomes are the success achieved by students in higher education that are realized in the form of numbers or letters (Wingkel, 1980). Numbers or letters obtained by students after receiving learning experiences and can be assessed or measured through tests. According to Semiawan that a person's learning outcomes can be obtained through learning outcomes tests that function to measure the acquisition of learning outcomes after taking place in an education, training or certain program. Learning outcomes are generally terminal evaluations to determine the position of individuals after completing a particular training or education (Conny, 1997). According to Purwanto, learning outcomes are also interpreted as changes in student behavior due to learning, so learning outcomes are a realization of the achievement of learning objectives (Purwanto, 2013). According to Sudjana, learning outcomes are the abilities possessed by students after receiving their learning experience (Nana, 2013). Learning outcomes can be seen after a person has engaged in learning activities, both towards something new or improved from what has been studied before which eventually will form a personality and can be described with results related to learning objectives. Whereas Good and Brophy study results are quite extensive, namely learning outcomes are relatively permanent changes in the field of understanding, attitudes, knowledge, information, abilities and skills through experience (Good and Brophy, 1990).

Starting from the opinions that have been stated above, it can be concluded that the learning outcomes of electric circuits course part 1 in the cognitive realm are abilities that can be measured including: the ability to remember, understand, apply, and analyze. Remembering is the ability to remind earlier learning material that is diverse from typical facts to complement theories. Understanding is defined as the ability to understand the meaning of the learning material received. Application refers to the ability to use learning material into real and new situations. Analysis refers to the ability to solve learning material into parts on its components, so that its organizational structure can be understood. Student learning
outcomes are the success achieved by students, namely the learning achievements of students in higher education are realized in the form of numbers (Wingkel, 1980) or letters. Learning outcomes are also interpreted as changes in student behavior due to learning, so learning outcomes are a realization of the achievement of learning objectives (Purwanto, 2013). Sudjana argues, learning outcomes are abilities possessed by students after receiving their learning experiences. Learning outcomes can be seen after a person has done a learning activity, both on something new or improved from what has been studied before which will eventually form a personality and can be described with results related to the learning objectives. The learning objectives as explained in the law consist of the cognitive realm, the affective domain and the psychomotor domain. In Suryanto's opinion, et al said, aspects that must be measured in the assessment of learning outcomes include: cognitive, affective and psychomotor aspects (Suryanto and Djatmiko, 2009). While Good and Brophy learning outcomes are quite extensive, learning outcomes are relatively permanent changes in the field of understanding, attitude, knowledge, information, abilities and skills through experience.

Before the learning ends, students are given electrical circuit material to be studied next week. Students will study, because before the implementation of the learning will be quizzes. Quiz giving with the aim that students read the material to be studied. In addition to reading habits, students will be actively involved in learning. Through the provision of quizzes, you will see students who read and students who lack or do not read. Quizzes are conducted in the form of short questions given to students before the learning process is carried out in class or after the learning process is complete. According to Murdiansyah the quiz can be given in the form of: Multiple Choice Single Answer (MCSCA) types, Multiple Choice Multiple Answer (MCMA), True / False and Essay types. The quiz is given according to the learning objectives or the planned grid.

Broadly speaking this assessment is divided into two, namely: (1) assessment of the teaching and learning process, (2) assessment of learning outcomes. Quiz giving is classified as an assessment of the learning process. Assessment of this learning process is carried out in the learning process except at the first meeting. According to Riskawati the purpose of the assessment of the teaching and learning process is to find out the extent to which students are able to master the material that will be taught or taught last week (Riskawati, 2017). The results of this learning process can be done by the lecturer with the aim of getting feedback on how much material is learned, understood by students. According to Salas, the assessment conducted on students aims to get quick feedback on student learning outcomes (Salas and Arazuo, 2012). In addition, giving quizzes aims to foster motivation and provide learning enthusiasm for students. The spirit of learning can be through competition or healthy competition among students in getting the best value possible. According to Ayu Setyan, competition that occurs can improve student learning outcomes (Ayu Setyan and Enny, 2012). According to Hamzah in Sumarni, explained that: giving quizzes at certain meetings, students are expected to be more enthusiastic, earnest or more active in attending lectures. This quiz is expected to encourage students to prepare themselves at home to study before entering class (Sumarni, 2006). By giving quizzes, feedback is obtained. Feedback obtained based on quiz / tests conducted by students is information for lecturers to find out how much the material delivered can be absorbed by students. According to Riskawati the giving of this quiz is an assessment to students to find out the mastery of the previous material that was carried out learning at each meeting. According to Riskawati in Nasution, that learning efficiency increases, if evaluations are often held by providing a direct diagnosis of the results.

Activities in following learning greatly determine student learning outcomes, especially student activities in following learning. Activities are carried out by someone whether in assignments, work, or study. Activity is movements that arise due to the need. The occurrence of activity is due to the encouragement that must be fulfilled in every human need of all its aspects. According to Sanjaya, student-oriented learning activities can be seen as an approach to learning that emphasizes student activities optimally to obtain learning outcomes in the form of a combination of cognitive, affective and psychomotor aspects equally (Sanjaya, 2008). According to Sukmadinata, (Sukmadinata, 1995) activities consist of; (1) motor activities include all individual, physical activities, for example; walking, jumping, and writing, (2) cognitive activities are individual activities related to experience,
understanding and tapping about the outside world, for example; sensing, observing, and thinking, (3) conative activities, namely activities relating to motivation to achieve something in the future, and (4) affective activities, namely those relating to a particular emotion or feeling.

Activities in learning are divided into two types, namely physical activity and spiritual activity. According to Dierdrecht as quoted by Ramayulis, physical activities and spiritual activities include; (1) visual activities (visual activities) such as reading, paying attention, demonstrations and experiments, (2) oral activities (oral activities) such as expressing, formulating, asking questions, giving advice, giving opinions, interviewing, and discussing, (3) listening activities (listening activities) such as listening to descriptions, conversations, discussions, music, speeches, and lectures, (4) writing activities such as writing stories, essays, reports, questionnaires, and copying, (5) drawing activities such as drawing, charting, making maps, and making patrons, (6) motor activities such as conducting experiments, making construction, repairing, gardening, playing, and maintaining animals, (7) mental activities such as concurrent, remember, solve problems, analyze, and make decisions, (8) emotional activities (emotional activities) such as being interested, happy, brave, calm, nervous, and amazed (Ramayulis, 1998). On the other hand, Gardner (Gardner, 1999) arguing that, we will find it difficult to know individuals who are very creative in terms of personality because people who score high on exams, often look mediocre in their activities.

According to Hamalik (Hamalik, 2001) the classification of student learning activities consists of reading, interviewing, listening to conducting experiments. According to Cole and Chan (Cole and Chan, 1994) learning activities contain activities: 1) oral (oral speech) such as answering questions or participating in discussions, 2) writing (writing) such as writing short answers, completing descriptions, summarizing, or actions directed to achieve goals (goal-directed action) such as making observations and solving problems. Learning activities are not only limited to classrooms, but also include activities outside the classroom (individual reading and homework), relating to settings (class activities, small groups or individual activities), both under the supervision of the teacher and activities freely. With continuous and well-conducted learning activities by students, it will have an impact on learning outcomes.

2. METHODOLOGY

This study uses a comparative quantitative research approach, with the experimental method using treatment by level 2 x 2 design. This study was conducted at the Electrical Engineering Vocational Education Study Program in the Faculty of Engineering, Jakarta State University. The research period is in the even semester of the 2017/2018 school year, which is from February to June 2018.

The population in this study is divided into two, namely target population and accessible population. The target population is all students of the electrical engineering vocational education program. While the accessible population is semester II students who are enrolled in electrical engineering courses in the 2017/2018 academic year as many as 75 students divided into 2 study groups.

The sample in this study was taken randomly from an accessible population to determine; 1) experimental class and control class; 2) In the quiz experiment class is given before the implementation of learning and quiz control class is given after the implementation of learning; 3) All students both in the experimental class and the control class are given a questionnaire of learning activities to find out students who have high learning activities and low learning activities; 4) to determine the sample size used in a representative manner representing the population; 5) to set a high and low group, which is 27% of the total sample in each group, there are a sample of 10 people. From the calculation results, the samples from both the control and experimental classes were 20 people respectively; 6) based on sampling techniques can be presented as shown in table 1 below;
Table 1: Disputes of Research Samples.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Quizzes (A)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Before the implementation of learning (A1)</td>
<td>After the implementation of learning (A2)</td>
</tr>
<tr>
<td>Learning Activity (B)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High (B₁)</td>
<td>10 students</td>
<td>10 students</td>
</tr>
<tr>
<td>Low (B₂)</td>
<td>10 students</td>
<td>10 students</td>
</tr>
<tr>
<td>Total</td>
<td>20 students</td>
<td>20 students</td>
</tr>
</tbody>
</table>

Data from the dependent variables collected through tests, and data from independent variables collected through questionnaires, collected data are then analyzed. The data analysis technique in this study was to examine the differences between the two groups with the treatment of two types of quizzes before and after the implementation of learning. Besides that, the two student groups were distinguished between students who had high learning activities and low learning activities. Testing the requirements of the analysis in this study is the normality test using Lilliefors test and the homogeneity test using Bartlett test. The inferential analysis in this study used two-way ANOVA.

3. RESULTS AND DISCUSSION

In this section the researchers will discuss the results of testing hypotheses based on the theory or the results of relevant research to show whether the results of the study support or not the relevant theoretical or research results. The following are the results of the calculation of two-way variance analysis, as shown in table 2 below;

Table 2: Results of Calculation of Two Path Variance Analysis.

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Db</th>
<th>JK</th>
<th>RJK</th>
<th>F_calculated</th>
<th>F-tab</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.05</td>
</tr>
<tr>
<td>Between Columns</td>
<td>2-1=1</td>
<td>9,80</td>
<td>9,80</td>
<td>5,751*</td>
<td>4.11</td>
</tr>
<tr>
<td>Interline</td>
<td>2-1=1</td>
<td>648,03</td>
<td>648,03</td>
<td>380,272</td>
<td>4.11</td>
</tr>
<tr>
<td>Interaction</td>
<td>1x1=1</td>
<td>9,02</td>
<td>9,02</td>
<td>5,296**</td>
<td>4.11</td>
</tr>
<tr>
<td>Inside</td>
<td>40-(2)(2) =36</td>
<td>61,35</td>
<td>1,70</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Reduced</td>
<td>39</td>
<td>728,20</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
1. Differences in the learning outcomes of electrical circuits in groups of students given quizzes before the implementation of learning and groups given quizzes after the implementation of learning.

The presence of students in learning in class is arranged in a learning system at Jakarta State University. In the Jakarta State University guidebook student attendance is at least 80% in class (Muchlis R. Luddin, 2014: 62). In addition to rules that can encourage students to attend, namely the implementation of quizzes and examinations. Menuru Lin (2016: 34) giving quizzes will encourage students to attend more in class before conducting the quiz / exam.

Based on the data on the results of the two-lane variance analysis calculation as shown in table 2, it shows $F_{count} = 5.75$ for the significant level $\alpha = 0.05$ and $df = 1:36$ obtained by $F_{table} = 4.11$. If the two $F$ values are compared then it turns out that $F_{count} (5.975) > F_{count} (4.11)$. The results of this analysis indicate that $H_0$ is rejected and $H_1$ is accepted, or it can be interpreted that there is a significant difference between the learning outcomes of the electrical circuit group of students given quizzes before the implementation of learning and after the implementation of learning.

Some researchers (Mawhinney et al., 1971; Bacon and Stewart, 2006; McIntyre and Munson, 2008) have provided empirical evidence that giving will encourage their presence before the quiz, by giving the quiz can improve learning outcomes.

2. There is an influence of the interaction between giving quizzes and learning activities to the learning outcomes of electrical circuits.

Quizzes made to students encourage them to study. Through the provision of quizzes, you will see students studying, lacking or not learning a student studying. In the above description (Riskawati) it was explained that, the purpose of the assessment of the teaching and learning process was to find out the extent to which students mastered the material would be taught or that had been learned last week. Furthermore, Hamzah in Sumarni explained that: giving quizzes at certain meetings, students will be more enthusiastic, earnest or more active in attending lectures. The sincerity of students in learning as explained by Aminurrahman (2012) student learning activities driven by learning motivation is a sign that students already have an inner awareness to study seriously. Awareness in learning is defined by several factors, namely; (attention, observation, response, fantasy, memory, thinking, talent and motives (Sardiman, 2011: 45). The greater the learning activities undertaken by students are very important in determining success in learning (Nurmala et al., 2014: 2). Rotten (2010) there are several indicators that can be used in observing student learning activities, namely as follows: (1) Students' enthusiasm in participating in learning activities, (2) Interaction between students and teachers, (3) Interaction between students and other students, (4) Work with groups, (5) Student activities in group discussions, (6) Student activities in carrying out learning, (6) Student skills in using teaching aids, (7) Student participation in concluding learning material.

Based on the description above, and the results of testing the interaction hypothesis as presented in table 2 above shows the value of $F_{count} = 5.30$ for a significant level $\alpha = 0.05$ and $df = 1:36$ obtained by $F_{table} = 4.11$. If the two $F$ values are compared then it turns out that $F_{count} (5.30) > F_{table} (4.11)$, which means $H_0$ is rejected and $H_1$ is accepted. This shows that there is an interaction effect between giving quizzes and student learning activities to the learning outcomes of electrical circuits.

The results of several previous studies namely; Lin (2016: 50), giving quizzes conducted every meeting to students can improve knowledge and information can last longer so that it can improve student learning outcomes. According to Salas et al. (2014: 43) there is a statistically significant relationship between quizzes and learning activities on learning outcomes.

3. The learning outcomes of the electrical circuit group of students who were given quizzes before the implementation of learning and groups of students who were given quizzes after the implementation of learning that had high learning activities.

According to Sulisworo and Suryani (2014: 59), the presence of friends in groups can cause motivation to learn from each other; they can help each other to overcome difficulties; mutual respect (listening); giving and giving opinions or ideas; help each other in completing assignments; and attentive during learning. According to Heinemann (in Hamid and Nofiza, 2018: 3) in the implementation of student learning will; (1) increase more active participation in learning to express their ideas more
 intensively, (2) have more opportunities to use their knowledge and skills comprehensively, (3) have more opportunities to develop their reasoning. Furthermore, Hamid and Nofiza (2018: 3) state that increasing learning activities will increase as long as students are given the opportunity to express ideas and investigate strategies to solve problems, both individually and in groups. Students are encouraged to learn to build, create, and hold argumentative arguments that make sense. Furthermore, Sardiman (2004) explains that activity is a learning principle that is very important in teaching and learning.

The results of the study using the Tukey test showed the learning outcomes of the electrical circuit groups of students who were given quizzes before the implementation of learning compared to the group of students who were given quizzes after the implementation of learning that had high learning activities. Data analysis showed that the average group of students given quizzes before the implementation of learning was $\bar{Y}_{AB1} = 14.44$ greater than the group of students who were given the quiz after the implementation of the learner, $\bar{Y}_{AB2} = 12.50$.

The results of this study indicate that students who have high learning activities are more appropriately given quizzes before the implementation of learning because it will encourage student learning activities and creativity during learning.

4. The learning outcomes of the electrical circuit group of students who were given quizzes before the implementation of learning and groups of students who were given quizzes after the implementation of learning had low learning activities.

In the implementation of learning in schools, teachers are not only required to master teaching materials, but also expected to know the characteristics of students because each student has a difference in learning activities and problem solving. With regard to problem solving activities, learning needs to be designed so that it can accommodate the diversity of student characteristics so that they can develop optimally according to their potential. The failure of the teacher in delivering the subject matter is not only because he does not have mastery, but also because he does not know how to teach certain subject matter correctly and correctly. In addition, lecturers can encourage and generate student learning activities. High student learning activities can improve learning outcomes achieved by students. According to Ainurrahman (2012) student learning activities that are motivated by learning motivation are a sign that students already have an inner awareness to study seriously. Awareness in learning is what must be done by various alternatives including giving quizzes. By giving regular quizzes will affect students to always be present in engaging in learning activities. But for students who have low learning activities indicated: 1) 60% do not read books assigned by lecturers and only 40% read; 2) 80% never enter the library, and 20% still enter the library to complete the assignment.

Based on the results of the study, it shows that the comparison between the learning outcomes of the electrical circuit groups of students given quizzes before the implementation of learning and groups of students given quizzes after the implementation of learning that have low learning activities is different. For groups that have low learning activities after data analysis shows the average group of students given quizzes after the implementation of learning is $\bar{Y}_{AB2} = 5.44$ higher than those given quizzes after the implementation of learning $\bar{Y}_{AB2} = 5.40$.

Student learning activities can be demonstrated through their activity in the classroom during the learning activities. While the activity of students can be seen from the enthusiasm of students in responding to questions raised by the teacher, expressing opinions, asking questions, or just giving full attention when the teacher explains. This means an increase in learning outcomes in the experimental class given a quiz at the beginning of learning is higher than the control class given the quiz at the end of learning (Side, 2017: 31)

**BIBLIOGRAPHY**


