The Main Trigger for being Unmotivated to learn Autotronic is Understanding the Electrical Wiring Diagram

Fuad Indra Kusuma[*], Erwin Komara Mindarta, Muchammad Harly, Windra Irdianto

Department of Mechanical and Industrial Engineering, Universitas Negeri Malang, Malang, Indonesia
[*]*Email:* fuad.indra.ft@um.ac.id

ABSTRACT

Currently, the automotive and electrical sectors have existed side by side. Almost all devices in the automotive are electrically based. The problem that is often encountered in learning is a decrease in learning motivation when learning about autotronic. However, the results of research so far have only focused on finding the right learning model. However, not much has been researched on the root causes of decreased motivation to learn. As a result, the output of the research results cannot be implemented in general. The method to be used is by comparing the motivation of students who have mastered the basics of electrical and those who have not. The main aspects that will be used to measure the level of learning motivation are the initiative, activeness, and creativity of students when troubleshooting assembling car body electrical. Through the results of this experiment, a comparison of the level of motivation to study autotronic will be seen. The hope is that these results can be a basis for consideration for researchers or educators to identify the root of the problem before determining the learning model to be applied.

Keywords: Autotronic, Electrical, Wiring Diagram.

1. INTRODUCTION

Subjects related to electrical are still an obstacle for students to master a competency. On the subject of automotive electrical, it tends to cause a decrease in student learning motivation because it is considered the most difficult to understand. In fact, the lecture program in the automotive field will not be separated from electrical material. An example is the electrical system of the car body. One of the main topics in this program is learning about car lighting systems.

In this program, students must master an understanding of how to draw, read, and apply wiring diagrams. However, the real conditions show that students experience difficulties and tend to lack motivation to learn [1]. This will have an impact on the achievement of their competence. In fact, if we look at the existing curriculum, this program has been equipped with basic electrical competencies and automotive engineering drawings. If we look at the level of competency attainment in SKKNI, students who have graduated from the basic electrical and automotive engineering drawing program should be able to easily study the automotive body electrical system program.

However, it is a surprising fact that there are still many students who experience problems and decreased motivation to study [2]. Especially in the automotive body electrical system program. On the other hand, they have actually taken basic electrical and automotive Engineering drawing programs. Therefore, there needs to be a special study to see or prove that the decline in learning motivation and student competency achievements in the body's electrical system program is caused by the lack of optimal mastery of basic electrical competencies and automotive engineering drawings. In addition, this study aims to rank the factors causing decreased motivation to learn. The hope is that we can find the source of the problem that causes student competency achievements in the body's electrical system program to not be optimal.

2. METHODS

This quantitative research uses experimental methods. The experiment was applied to 80 students who programmed the Body Electrical Practicum course. The experiment was carried out by comparing the level of competence in the basic electrical and automotive drawing courses with learning motivation and competency achievement in the Body Electrical

Practicum course [10]. Competency level data for basic electrical and automotive drawing courses were obtained from pre-test scores at the beginning of lectures. Meanwhile, learning motivation is assessed based on the level of learning activity in the body electrical practicum course. The level of student activity was assessed from the involvement factor in solving the problem of assembling wiring diagrams, the number of wiring diagrams that students were able to explain, and the number of trials assembling the body's electrical system during lectures. And the achievement of competence is seen in the ability to draw wiring diagrams, explain the working principles of wiring diagrams, and install wiring diagrams on the car body electrical learning media. The minimum standard score that must be achieved to be included in the competent category is 75 [11]. Based on these data, it can be analyzed the causes of the decrease in learning motivation and the source of the problems in the achievement of car body electrical practicum competence.

3. RESULTS AND DISCUSSION

3.1. Basic Electrical Competence

Basic competence is a main foundation in learning activities [3]. Basic electrical competence is a requirements competency that must be mastered by students before programming body electrical practicum courses. These competencies consist of basic competencies which include Ohm's law theory, electrical components, and the use of electrical measuring instruments. basic electrical competence will be applied to its utilization in the body electrical practicum course. So, basic electrical is an initial competency that must be mastered by students.

Based on Figure 1 it is known that the majority of students have mastered basic electrical competence. Meanwhile, 35% of students are still below the competency standards that must be achieved. This data was obtained after a pre-test was carried out before the body electrical practicum lecture began. Data on the percentage of basic electrical competency achievements show that the majority of students already have the sufficient basic knowledge to carry out body electrical practicum. Whereas 35% of students still have not reached the expected competency standards, generally due to factors of memory, comprehension in reading test questions, and level of concentration at the beginning of lectures.
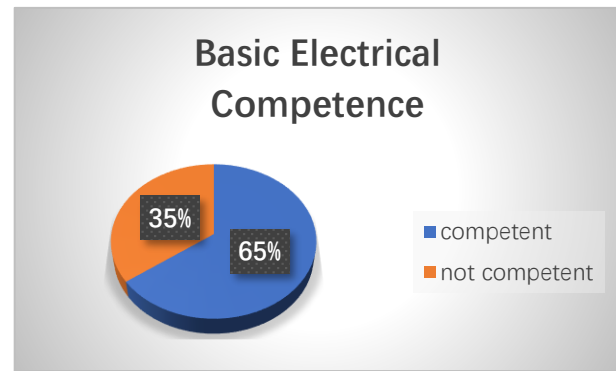

Figure 1. Percentage of Basic Electrical Competence.

3.2. Kompetensi Gambar Otomotif

Automotive drawing competence is the ability of students to draw wiring diagrams and explain their working principles. In this test, students are given a lighting system wiring diagram, but the components are not yet connected. So, students are asked to connect the electrical network between components so that it can function properly. [12] To further ensure that students master this competency, they are asked to explain the results of the wiring diagram.
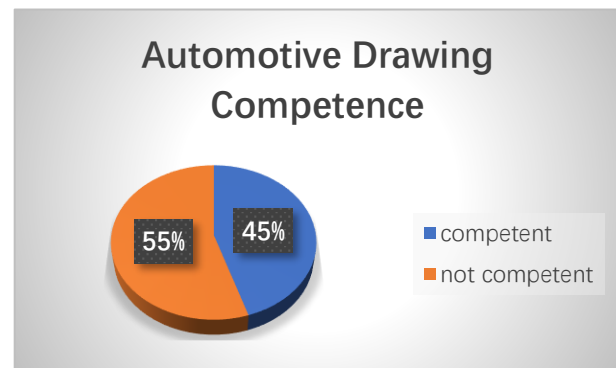

Figure 2. Percentage of Automotive Drawing Competence.

Based on Figure 2, it is known that the majority of students have not mastered automotive drawing competencies. It is known from the results of the pre-test, 55% of students have not been able to achieve these competency achievement standards. An interesting fact was found that the majority of them could draw a lighting system wiring diagram but could not explain its meaning. This means that they cannot read electrical wiring diagrams yet. This finding is a concern because reading wiring diagrams is the key to assembling and repairing electrical systems [4].

3.3. Learning Motivation

Learning motivation in this study is traced through aspects of student involvement in finding solutions when the results of the body's electrical circuits experience

problems or do not work, students' efforts to explain the wiring diagrams that have been drawn, and student initiatives in carrying out exercises assembling the body's electrical system. Of course, this motivation is influenced by internal and external factors [5]. But on this occasion, it is more focused on the level of student motivation. The results of the analysis of learning motivation in the vehicle body electrical practicum are presented in Figure 3.
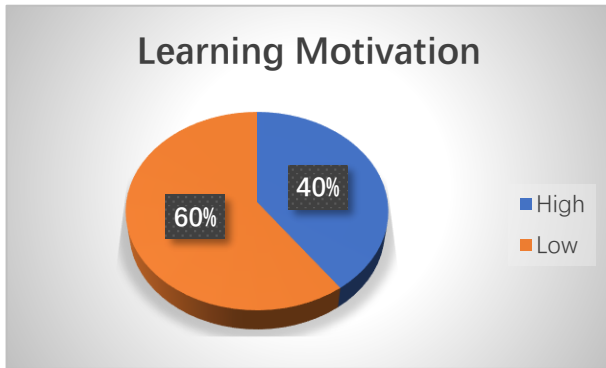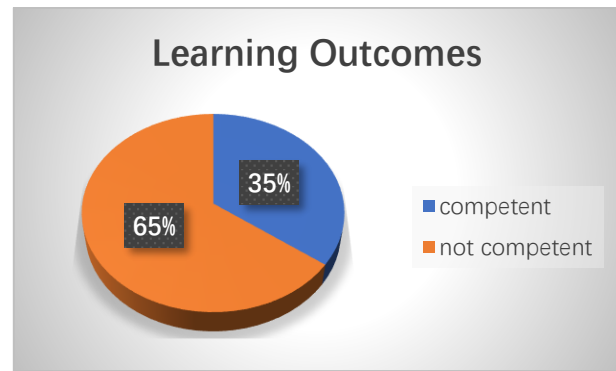

Figure 3. Percentage of Learning Motivation.

Based on Figure 3 it is known that the level of student learning motivation, the majority is still relatively low. Only 40% of students have high motivation, as seen from the high activity of practicing assembling wiring diagrams and troubleshooting. So, of the three elements of learning motivation assessment, the most dominant is the activity of assembling and solving problems in the body's electrical system.

3.4. Body Electrical Practicum Competency

The achievement of body electrical practicum competency is the result of student learning as seen from the ability to draw wiring diagrams, explain wiring diagram images, and assemble wiring diagrams on learning media for car body electrical systems. These three abilities are coherent stages mastered by students so that they can be declared competent [13].

Based on Figure 4, it was found that 65% of students could not be declared competent. This data shows that the achievement of body electrical practicum competency is still low. In addition, this fact reinforces the stigma that automotive electrical is a difficult part to study in the automotive field. The phenomenon that electrical is still the main learning obstacle in the automotive field is still undeniable.

Figure 4. Percentage of Learning Outcomes.

3.5 Correlation between Basic Competence and Learning Motivation

Students who have mastered basic competencies tend to be motivated to learn higher competencies [6]. Students find it easier to learn applied science compared to students who are not equipped with basic competencies. The level of difficulty of a competency affects the motivation to learn. If the basic competencies have been mastered, of course, it will be easier to reach a higher level of competence. This is the same as the level of learning that we have gone through from elementary school to university.

It's the same with basic electrical competence and automotive drawings. Both are basic competencies that will be applied to the body's electrical system. The combination of the two will make it easier for students to achieve advanced competencies [7]. However, based on the data obtained, there are differences in the level of influence between basic electrical competence and automotive drawings on student learning motivation in body electrical.

The fact obtained is that the level of influence of automotive drawing competence on learning motivation is higher than basic electrical competence. After further study, it was found that basic electrical competencies tended to be theoretical, while automotive drawing competencies were a combination of theoretical and practical. A competency that contains theoretical and practical activities tends to have more impact on applied competence because of the combination of theoretical knowledge which is simultaneously applied or trained in a lesson [8]. Thus, students get experience learning theory and practice simultaneously. Meanwhile, a theoretical competency is indeed easier to learn but it is tedious.

This phenomenon can be accepted logically because the nature of vocational students tends to prefer learning related to practical activities. So automotive image competence tends to have more influence on learning motivation in body electrical practicum. For students

who have not mastered automotive drawing to the fullest, it will reduce their motivation to learn in body electrical.

Generally, students who have not mastered automotive drawing competence have several learning characteristics. Some can draw but cannot interpret the drawing into the activity of assembling the wiring. Or students who cannot draw and interpret wiring diagram images. Both are very fatal because all competencies related to electricity will be difficult to learn. Meanwhile, at this time it is unavoidable that the automotive and electricity sectors have lived side by side [9].

3.6 Correlation between Learning Motivation and Body Electrical Competence

It is undeniable that to be able to master a skill competency, each individual must be equipped with learning motivation. Learning motivation must be grown so that students can learn competency more easily. Learning motivation that arises from within (internal) and from outside (external) must be maximized. Both will affect student learning conductivity to achieve the expected learning outcomes, namely competence achievements [14].

Achievements of body electrical practicum competencies consist of the ability to draw, explain, to assemble wiring diagrams. From the data obtained and shown in Figures 4 and 5, it can be concluded that low learning motivation will harm competency achievement. Students with low learning motivation tend to experience problems in applying wiring diagrams to the activity of assembling the vehicle body's electrical system.

The constraints experienced by students harm their learning outcomes. Thus, the competency achievement target will be difficult to achieve. So, the relationship between learning motivation and competency achievement is very strong.

4. CONCLUSION

Basic competencies in the form of basic electrical competencies and automotive drawings influence student learning motivation. However, automotive image competency has a stronger influence. High learning motivation will increase student opportunities to get better learning outcomes [15]. So, indirectly it can be concluded that the mastery of basic competencies will affect student learning outcomes. The main finding in this study is what are the main triggers for decreased learning motivation that can affect learning outcomes or final competency achievement? The answer is understanding basic competence is the main trigger for the level of learning motivation to increase or decrease. So, the academic community must consider strategies to improve students' mastery of basic competencies so as not to encounter obstacles in achieving their applied competencies.

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