

Jigsaw learning model in increasing interest and learning of automotive electrical systems

Cecep Ardian¹, Subagyo², Arif Bintoro Johan³

^{1,2,3}Program Studi Pendidikan Teknik Mesin, Universitas Sarjanawiyata Tamansiswa

E-mail: ¹cecepardian9@gmail.com ²yokssubagyo@gmail.com

Abstracts. The purpose of this study was to determine the increase in interest in learning and learning outcomes Automotive subjects Jigsaw cooperative learning model. This research is a class act. The data collection technique using observation, tests and questionnaires. The validity of the instrument in this study using the content validity using expert judgment. Data were analyzed using quantitative analysis techniques. The results showed that the application of cooperative learning model Jigsaw on the subjects of automotive electrical systems can increase interest and student learning outcomes in class XI SMK (Taman Karya) Tamansiswa Jetis Yogyakarta. Increased student interest in the first cycle an average of 59.04 (low) increased to 73.96 (currently) in the second cycle and increased again to 76.80 (high) in the third cycle. It can be concluded that Jigsaw cooperative learning model can improve learning outcomes interest and automotive electrical systems in class XI student of SMK (Taman Karya) Tamansiswa Jetis Yogyakarta.

Keywords: jigsaw, interests, learning

Introduction

Education is one of the main pillars in determining social change. Education in general has been explained in the Article 1 paragraph 1 of the National Education System Act, which states that education is a conscious and planned effort to create a learning atmosphere and learning process so that students actively develop their potential to have religious spiritual power, self-control, personality, intelligence, noble character, and skills needed by him, society, nation and country.

According to [1], what is called education is guidance in the life of children. The purpose of education is: to guide all the natural strengths of the children, so that they as human beings and as members of the community can achieve the highest safety and happiness, the first time that must be remembered that education is only one guidance in life the growth of children lies beyond the skills or will of the educator. Based on these definitions, it can be concluded that education is very important for individuals, nations and countries so that the education process must be carried out as well as possible and achieve the expected goals.

The purpose of education is used as the main guideline in managing education, and what results are expected in the educational process in an educational institution. The aim of national education described in Law No. 20 of 2003 article 3, namely national education aims to develop the capabilities and forms of dignified national character and civilization in order to educate the nation's life, aiming at developing potential students to become faithful and pious human beings to God Almighty, noble, healthy, knowledgeable, capable, creative, independent, and a democratic and responsible citizen.

Based on the results of observations on the subjects of auto-motive electrical systems in Vocational Schools (Taman Karya) Yogyakarta Jetis students there are several problems including: the lack of variety of teachers in choosing the learning model appropriately in a subject that will be delivered - in the teaching and learning process, lack of seriousness and enthusiasm of students following learning, learning is still teacher-centered. This makes students less interested in learning, there are still many student learning outcomes that have not yet reached KKM. The possibility of these various problems arises because the learning activities are monotonous with the learning

model that is often used by the teacher, namely using lecture or conventional models.

Based on the description above, the researcher decided to research using the jigsaw cooperative learning model, this learning is a cooperative learning model by the way students learn in small groups of four to six groups heterogeneously and students work together. With that the creation of communication between students and learning to discuss and be responsible independently of the arguments that are owned.

Learning is the process of changing a person's behavior or person based on the interaction between an individual and his environment which is done formally, informally, and nonformally [2]. Learning is a business process carried out by individuals to obtain a new change of behavior as a whole, as a result of the experience of the individual himself in interaction with his environment [3].

In terms of the etymology of Jigsaw comes from English, namely jigsaw and there are also those who call it the term puzzle, which is a puzzle that composes pieces of the picture. This jigsaw cooperative learning model also takes a pattern of how to work a saw (jigsaw), that is, students do something learning activities with other students to achieve a common goal. In Jigsaw learning, students are divided into groups with members of groups of 5 or 6 heterogeneous people. Learning material is given to students in the form of text that has been divided into several sub-chapters (Sujarwo, 2011: 106).

According to Hilgard quoted by [3] Hilgard gives a formula for interest as follows: "Interest is persisting, tendency to pay attention to and enjoy some activity or content". According to [4] interest is a feeling of being more like and feeling attached to a thing or activity, without being told. According to Crow and Crow quoted by Djaali said that interest is related to the style of motion that encourages a person to deal with or deal with people, objects, activities, experiences that are stimulated by the activity itself. According to [3] interest is a fixed tendency to pay attention and remember some activities. Activities that are of interest to someone, are constantly being watched with pleasure. According to [2] learning outcomes are learning experiences obtained by students in the form of certain abilities. Disclosure of ideal

learning outcomes covers all psychological domains that change as a result of students' experiences and learning processes [5]. According to Snelbeker, quoted by [6], that changes or new abilities obtained by students after doing learning actions are the results of learning, because learning is basically how a person's behavior changes as a result and experience.

Rusman in [7] The jihadist type of cooperative learning model focuses on group work in the form of small groups. The method or type of jigsaw is a cooperative learning method by means of students learning in small groups consisting of four to six groups in a heterogeneous manner. In this learning, students also have many opportunities to raise opinions and improve communication skills. Group members are responsible for the success of the group and the accuracy of the part of the material learned and can convey to the group. This shows that learning in groups and discussing with study partners creates an active learning situation. Suggests that "interest is a feeling of being more like and feeling interested in something or activity" [4].

In jigsaw learning, students must be responsible for their own learning and groups, in their learning students must be able to be responsible for structuring a number of learning materials and able to explain the material that has been mastered to each group. Seeing this, the Jigsaw cooperative learning model can increase student interest and learning outcomes. This is supported by research conducted by Ahmad Nurdian-syah (2016) which states that the Jigsaw cooperative learning model can improve learning activities and student learning outcomes.

Reaseach Methods

Seeing this, the Jigsaw cooperative learning model can increase student interest and learning outcomes. This is supported by research conducted by Ahmad Nurdian-syah (2016) which states that the Jigsaw cooperative learning model can improve learning activities and student learning outcomes. This research was conducted at Tamansiswa Vocational School (Taman Karya) especially in the XI class of Light Vehicle Engineering, which was addressed at Jl. Pakuningratan No.34 A Jety Yogyakarta.

The research subjects were class XI students of Jetis Vocational Vehicle Engineering (Taman Karya) Park. The object of this research was the application of the Jigsaw cooperative learning model to increase students' interest and learning outcomes in automotive electrical system subjects. In accordance with this study, namely classroom action research, the researchers used the theory from Kemmis & Mc Taggart in [8] with the following stages: stages of planning, implementation, observation, reflection.

In cycle I contains material Understanding the electrical system, safety, and additional equipment, cycle II understands conventional ignition systems, and cycle III understands the starter system. Each cycle will carry out the following actions: (1) the planning stage that contains (a) making learning instruments (lesson plans, expert material sheets, test sheets, presentation material). (2) the implementation stage which contains (a) the teacher makes an opening and the class leader leads the prayer to begin learning (b) the teacher checks the attendance of the students (c) the teacher explains the learning objectives and explains the jigsaw learning model (d) the teacher classifies students into 5 to 6 groups (e) each group is given the material specified (f) group members who have studied the section (sub-section) meet in the new group. (g) after finishing the discussion the expert team returns to the original group and alternately teaches his friend in one group of origin about the sub-section that has been mastered. (h) each expert team presents the results of the discussion. (i) the teacher gives a test sheet to each student (post-test). (j) the teacher concludes the learning outcomes and conveys learning that will (3) the stage of observation or servitude which contains (a) the situation of teaching and learning activities using the Jigsaw type cooperative learning model. (b) Students' ability in group discussions. (c) students' ability to deliver material. (d) students' ability to answer test questions. (4) reflection stage (a) reflecting on the teaching and learning process that has been implemented. (b) record problems that occur during the learning process. (c) evaluate the results during the learning given to students. Observation dating and closing greetings. the implementation of learning Jigsaw cooperative learning model is focused on students during the learning process takes place.

The questionnaire in this study was used to determine the increase in student interest in learning. Questionnaire contains 25 items, each answer has a score, the questionnaire score is 4 = Strongly Agree (SS), 3 = Agree (S), 2 = Disagree (TS), 1 = Strongly Disagree (STS).

The test is carried out to get the data on student learning outcomes and aims to determine the extent of the ability of students before the action and after the action is taken. The test contains 15 questions in the multiple choice form where each has a weight of 1 (one). Score 1 = If the correct answer is Score 0 = If the answer is wrong.

Determining the score based on the results of the observer Observation is carried out by the observer by observing the activities of the students. If students do activities they will get a score of 1 and if students do not do activities they will get a score of 0. How to calculate the percentage on the observation sheet based on the observation sheet:

Determining the score based on the questionnaire answer choices, For each item score in the interest questionnaire students use a Likert scale score, namely: 1, 2, 3, 4. Strongly Agree (SS) = 4, Agree (S) = 3, Disagree (TS) = 2, and Strongly Disagree (STS) = 1. For the calculation of the score to be the value of the student response questionnaire the following formula is used:

Result

Results between cycles show the average value of learning interest obtained by students in cycle I is equal to

59.04 and in the second cycle the average value of learning interest was 73.96 so the value increased by 14.91 points. Then in the third cycle the increase in the value of learning interest increased by

2.84 points to 76.80. This shows that the learning interest of the Tamansiswa Jetis Vocational High School (TKR) XI grade students has increased. The results of learning interest are summarized in table 1. as follows:

Table 1. Average Value of Inter Cycle Shopping Interests

Siklus	Nilai Rata-rata	Peningkatan
Siklus I	59,04	14,91
Siklus II	73,96	16,00
Siklus III	74,00	3,32

The average value in the first cycle of 59.04 increased by 14.91 to 73.96 in the second cycle. and the first cycle of 48.00% showed an increase to 16.00% of students. Due to the failure of the KKM target of ≥ 75 as much as 75% of students, it was continued to the second cycle, in the second cycle the learning outcomes of Cycle II showed that the average value obtained was 74.00, the increase in the second cycle reached 3.32.

**Figure 1.** Diagram Perkembangan Nilai Siswa *Pre-Test*, Siklus I, Siklus II dan Siklus III

973/5000

In line with research from Juwahir about the Application of the Jigsaw Method to Increase Motivation and Learning Outcomes in Automotive Basic Technology Subjects. This type of research is classroom action research. Methods of data collection using questionnaires, observation, documentation, and test results. Data analysis method uses quantitative description analysis method. The results of the study showed that there was an increase in learning outcomes and motivation to learn basic automotive learning subjects with a Jigsaw learning model. This can be proven by an increase in the percentage of learning activities in the first cycle with a percentage of 24.75%, increased in the first cycle to 57.79%, increased in the second cycle to 67.04%, and the third cycle increased again to 77.57 %. While the pre-test to post-test scores also increased. In the first cycle the increase in pre-

test to post-test was 20.75. In cycle II 31,25 and cycle III 33,12..

Conclusion

1. The application of Jigsaw cooperative learning mode on automotive electrical system subjects can increase the learning interest of the Tamansiswa Jetis Vocational High School XI students in Yogyakarta. This is shown based on the results of the study note the development of student learning interest in the first cycle an average of 59.04, categorized (Low) increased to 73.96 (Moderate) in the second cycle and increased again to 76.80 (High) in the third cycle.
2. Based on the results of the study it can be concluded that the application of the Jigsaw cooperative learning model on automotive electrical system subjects can improve the learning outcomes of the XI TKR SMK (Taman Karya) Jetis Yogyakarta students. This can be seen in the success of learning outcomes in the first cycle, 48.00% of students who achieved a minimum standard score of 75. Increased in the second cycle the number of students who achieved a minimum standard score had reached 64.00%. While in the third cycle students who achieve a standard score of at least reach 80.00%.

Based on the results of the study, it can be explained that learning using the Jigsaw cooperative learning model can increase students' interest and learning outcomes in the XI TKR (SMK Taman Karya) class of Tamansiswa Jetis Yogyakarta, on the basic competencies of the automotive electrical system. Because learning activities require a learning model that can stimulate students to be able to actively interact in the learning process. With the Jigsaw cooperative learning model, students can be encouraged and interested in working together in discussions, actively expressing opinions and helping each other in solving problems. The results of this study can be used as a reference in the application of learning models to increase interest and learning outcomes so that it can help achieve learning according to the standards expected.

Research Limitations

In this study researchers have deficiencies in carrying out research. In the first cycle the

researcher as an observer in the implementation of teaching and learning so that the research process went well. Furthermore, in cycles II and III, observers were asked to help teach in the classroom, so the researchers were reluctant to reject the request from the automotive electricity teacher, so the researcher carried out a dual task of carrying out the teaching and learning process and as an observer so that this thesis had drawbacks.

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