

The Effect of Learning Model Based on Entrepreneurship and Work Attitude towards on Student Learning Outcomes of Welding Technology

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Abstract: *The aims of this research are to (1) find out the differences between students learning outcomes who were taught by using project based learning and problem based learning; (2) find out the differences between student learning outcomes that had positive work attitudes and negative work attitudes; (3) find out the interaction between learning models and work attitudes towards learning outcomes of welding technology. This research method was quasi-experimental design, with descriptive and inferential analysis, 2x2 factorial design and two-way ANOVA analysis and continued with the Scheffe test. The results showed that: (1) the student learning outcomes who were taught by using project based learning were higher than problem-based learning; (2) the student learning outcomes of welding technology who have high work attitudes are higher than low work attitudes; (3) there is an interaction between learning models and work attitudes towards learning outcomes of welding technology. The results showed that students who had positive work attitudes were get better grades if taught with project based learning, while students who have negative work attitudes get better if taught with problem based learning.*

Keyword: *learning models, project based learning, problem based learning, entrepreneurship, work attitude, welding technology*

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I. Introduction

Education is the most important element in the evolution of the nation. The country will advance if there is an increase in better education. The progress of education will have a positive impact in increasing human resources. The world of education is currently entering an era digital revolution, the use of technology in the workplace is also growing so it must balance to an education system that is ready to work

Miarso [1] said that "human resources are the most important basic capital of development". Further education is explained for the development of human quality covering all aspects of human development in the dignity of being intelligent, personal, community and citizen. Education must reflect the process of humanizing humans in the sense of actualizing all of their potential into abilities that can be utilized in everyday life in the wider community.

The model is a three-dimensional representation of real objects [2]. Learning model is a plan or a pattern that is used as a guide in planning class learning or learning in a tutorial [3]. In applying learning with practice models, students are placed as the center of the learning process, students are not the object of education. In addition to factors from the teacher, factors within students also affect the learning process. In addition to the practice model used by teachers, student learning outcomes are also influenced by various factors, as stated by Slameto [4] other factors that influence student learning outcomes are attitudes. Attitude is something that is learned and attitude determines how individuals react to situations and determines what individuals look for in life.

According to David Mc. Clelland was quoted by Mudjiarto [5] the results of the study showed that for those who have the desire to achieve higher, approximately 66% of them chose a career as an entrepreneur, while 34% chose other occupations.

Bogardus, LaPierre, Mead and Gordon Allport quoted by Azwar [6] stated that attitude is a kind of readiness to react to an object in certain ways. Readiness is a potential tendency to react in certain ways when individuals are faced with a stimulus that requires a response. Furthermore, Secord & Backman cited by Azwar [7] states that attitudes are certain regularities in terms of thought (cognition), feelings (affection), and predisposition of one's actions (conation) to an aspect in the surrounding environment.

Entrepreneurship

An entrepreneur is an individual who practices diligence in carrying out work. Based on the word concept, which is an entrepreneur who states, among others, can be interpreted as a hero, and business that can be interpreted as carrying out economic activities, entrepreneurship can be defined as follows: a person who is striving to run a business activity with the aim of achieving results that can be proud of. Someone can be classified as an entrepreneur if he has high self-confidence, believing that he can achieve the goals he wants. Entrepreneurship as a trait and expertise possessed by entrepreneurs. Thus entrepreneurship can be interpreted as the character of an entrepreneur, who is brave to take risks, wise in making decisions, good at seeing open opportunities and can be a good manager [8].

To become a successful entrepreneur, there is nothing more important than our willingness and ability to continuously learn and build creativity from what we learn all the time. The willingness to learn, change and grow and not be afraid to make mistakes or failures is the fuel for the growth and development of our business. Most people are not successful in life because they are not willing to go through periods of personal uncertainty and emotional frustration. This is because we learn in school that mistakes are bad and should be avoided. So we leave school, sit in the nest and never learn to fly [9]. According to Sukirno [10] An effective and successful entrepreneur has the following characteristics and personality: (1) Confidence, (2) Humanity Oriented, (3) Task and Decision Oriented, (4) Attitude of Idea and Creative Authenticity, (5) Future-Oriented, (6) Willing to Take Risks, (7) The Ability to Make Decisions, (8) Planning-Oriented, (9) Ability to Establish a Company, and (10) Management Capabilities.

According to Kainrath [10], Entrepreneurship Education is to help students realize entrepreneurial education. This project-based learning aims to make students in the learning process in addition to creating interesting and meaningful learning experiences that have an impact on the mental maturity, attitudes, and skills of students entering the workforce and hopefully students can recognize the impact of technology in their social life and can know interactions between social, technology, society and the environment. Students are expected to be able to understand and apply the spirit of entrepreneurship so that later students can live and work, and be able to make the right decisions and be able to take responsible personal and social actions in society.

The Nature of Learning Results in Welding Technology

According to Sudjana [11], learning outcomes or achievements are the realization or expansion of potential skills possessed by someone. Mastery of learning outcomes by a person can be seen from his behavior, both behavior in the form of mastery of knowledge, thinking skills, and motor skills.

Welding business can be an option for vocational high school graduates. According to Suparyanto [12] small business is a business sector that receives a lot of attention from various groups and its role is very dominant in Indonesia's national development. skills in business can be obtained from productive subjects, including (1) oxy-acetylene welding (OAW) techniques; (2) Shielded metal arc welding (SMAW) welding techniques; and (3) Metal Inert Gastechniques (MIG/MAG). Nasser's opinion that was quoted by Ramadani [13] states that if students already have competence in certain fields, it will create confidence for them to enter the world of work both in industry and entrepreneurship.

Hisrich [14] the background that also influenced the formation of the entrepreneurial spirit was work experience. According to Rusdiana [15], the knowledge that must be possessed by entrepreneurs includes (1) knowledge of businesses that will enter, be pioneered and the existing business environment; (2) knowledge of roles and responsibilities; and (3) knowledge of business management and organization. This knowledge is obtained by students through compulsory subjects in schools, namely crafts and entrepreneurship.

Project Based Learning (PjBL)

The projectbased learning model is innovative learning-centered on students and the teacher as a motivator and facilitator, where students are allowed to work autonomously to construct their learning [16]. The project-based learning model is a learning model that involves a project in the learning process.

According to Thomas et al (Wena) [17], Project Based Learning is a learning model that provides an opportunity for teachers to manage to learn in class by involving project work. It is uses projects or activities as media" [18]. Project-based learning model is the assignment of tasks to all students to be done individually, students are required to observe, read and examine [19].

Based on above definitions, the researcher concludes that the project-based learning model is learning that focuses on the activities of students to be able to understand a concept and principle by conducting in-depth research on a problem and finding relevant solutions and learners learn independently and the results of learning this is a product.

The learning model is an important component in learning activities, in this case, not all characteristics of the learning model match the characteristics possessed by students. Project-based learning models, namely: (1) Students as decision-makers, and create a framework; (2) there are problems whose solutions are not

predetermined; (3) Students as process designers to achieve results; (4) students are responsible for obtaining and managing the information collected; (5) conducting further evaluations; (6) Students regularly look back on what they are doing; (7) final product form and quality evaluation; (8) class has an atmosphere that tolerates error and change [20].

The advantages of project-based learning include: (1) Increasing motivation, where students persevere and strive to achieve projects and feel that learning in projects is more fun than other curriculum components; (2) Improving problem solving abilities, from various sources that describe project-based learning environments making students more active and successful in solving complex problems; (3) Enhancing collaboration, the importance of group work in projects requires students to develop and practice communication skills; (4) Improving the skills of managing resources, if properly implemented, students will learn and practice in organizing projects, making time allocations and other resources such as equipment to complete tasks; (5) Improving students' skills in managing learning resources; (6) Encouraging students to develop and practice communication skills; (7) Providing learning experiences that involve complex students and are designed to develop according to the real world; (8) Making the learning atmosphere enjoyable, so students and educators enjoy the learning process [21].

Problem Based Learning (PBL)

Problem Based Learning is a learning model that is based on constructivism and accommodates student involvement in learning and is involved in contextual problem-solving. To obtain information and develop science concepts, students learn about how to build a framework of problems, examine, collect data, and organize problems, arrange facts, analyze data, and construct arguments related to problem-solving, both individually or in groups [22].

Work Attitude

Attitudes are evaluative statements both desirable and undesirable regarding objects, people, or events. Attitudes reflect how someone feels something according to Stephen P. Robin [23]. According to Slameto [24], Another factor that influences learning outcomes is an attitude. Attitude is something that is learned, and attitude determines how individuals react to situations and determine what individuals look for in life. The above formula states that the attitude contains three components, namely the cognitive component, the affective component, and the behavioral component. The attitude always pleases an object, and the attitude towards this object is accompanied by positive and negative feelings. People have a positive attitude towards an object that is valuable in his view and will be negative towards an object that is considered to have no value and adverse.

Furthermore, Ellis cited Purwanto [25] as saying the most important thing in attitude is the feeling or emotion factor, and the second factor is the reaction or response, or the tendency to react. In some cases, attitude is an important determinant in human behavior. As a reaction, the attitude is always associated with two alternatives, happy or not happy, obey and implement, avoid something.

Every human being has an attitude. In general, attitudes are divided into positive and negative attitudes. According to Schermerhorn, Hunt, Osborn, and Uhl-Bein in Wibowo [25], attitude is described as a tendency to respond positively or negatively to someone or something in their environment. Attitudes will appear when we say like or dislike something or someone. Whereas in another meaning "Attitude is a statement that is pleasant or unpleasant to the object, individual, or event. This reflects how someone feels about something" [26]

Wibowo [27] concluded that the attitude component has the same meaning, namely Cognitive is the same as Belief, Affective is the same as feeling and behavior is the same as behavioral intention. Meanwhile, to the research to be conducted, student work attitudes are examined using three indicators, namely student confidence (Cognitive), Student Feelings (Affective) and student actions (behavior).

The formulation of this research (1) is there any the differences between students learning outcomes who were taught by using project based learning and problem based learning? (2) is there any the differences between student learning outcomes that had positive work attitudes and negative work attitudes? (3) is there any the interaction between learning models and work attitudes towards learning outcomes of welding technology?

II. Methods

This research was conducted in the mechanical engineering education program for the odd semester. The research treatment is carried out by adjusting the welding schedule that has been structured.

The population in this study were all students who took welding technology courses in the odd semester in the mechanical engineering education program. Which consists of 2 classes. From the total of population, 2 (two) classes were taken as a sample of all, because of less than 100 students. So that a total of 63 students.

This study is a quasi-experimental with a 2 x 2 factorial research design. Through this design, it will involve two sample groups each designated as the first experimental group using the Project Based Learning and the second experimental group using problem based learning in thewelding of technology courses.

The end of this experiment is expected to get information about the differencesin learning outcomes of welding technology through the Project based learning model compared to the problem based learning model. The learning model of project based learning and the problem based learning model are independent variables while work attitudes are divided into positive work attitudes and negative work attitudes as moderator variables and learning outcomes of welding technology as the dependent variable.

Table no 1 :Factorial Design Table Representing a 2 x 2 Factorial Design

Learning Model (A)	Project Based Learning (A ₁)	Problem Based Learning (A ₂)
Work Attitude(B)		
Positive (B ₁)	A ₁ B ₁	A ₂ B ₁
Negative (B ₂)	A ₁ B ₂	A ₂ B ₂

Where :

A = Learning Model

A₁ = Projek Based Learning.

A₂ = Problem Based Learning

B = Work Attitude

B₁ = Positive Work Attitude

B₂ = Negative Work Attitude

A₁B₁ = The learning outcomes of welding technology are taught by the project based learning model and positive work attitudes

A₁B₂ = The learning outcomes of welding technology are taught by the project based learning model and negative work attitudes

A₂B₁ = The learning outcomes of welding technology are taught by the Problem based learning model and Positive work attitudes

A₂B₂ = The learning outcomes of welding technology are taught by the project based learning model and negative work attitudes

The data analysis technique are useddescriptive and inferential statistical techniques. Descriptive statistical techniques are used to describe data including the mean, median, standard deviation and data trend. Inferential statistical techniques are used to test research hypotheses, where the inferential technique used is a two-way analysis of variance (ANOVA) technique with a significant level of 0.05%.

Before this analysis technique is used, the analysis requirements test is first performed, carried out with the normality test using the Liliefors test and homogeneity test using the Bartlett test (Sudjana, 2009: 261). If there are interactions between variables, then the analysis continues with the different test using the Scheffe test. If the number of research subjects per cell does not differ, but if each cell is the same then proceed with the Tuckey test.

Based on the research hypotheses that have been formulated in advance, the following statistical hypotheses can be compiled that will be tested as follows:

1. First Hypotheses

$$H_0 : \mu_{A1} = \mu_{A2}$$

$$H_a : \mu_{A1} \neq \mu_{A2}$$

2. Second Hypotheses

$$H_0 : \mu_{B1} = \mu_{B2}$$

$$H_a : \mu_{B1} \neq \mu_{B2}$$

3. Third Hypotheses

$$H_0 : A \times B = 0$$

$$H_a : A \times B \neq 0$$

Where:

μ_{A1} = The Average learning outcomes of welding technology students are taught by learning based project learning models

μ_{A2} = The Average learning outcomes of welding technology students are taught by learning based project learning models

μ_{B1} = The Average learning outcomes Welding technology students who have positive work attitudes

μ_{B2} = The Average learning outcomes Welding technology students who have negative work attitudes

A x B = The interaction between learning model based on entrepreneurship with work attitudes.

III. Result

Results

Based on the data about learning outcomes of welding technology, the next step is to calculate the total value and the average value of each treatment group, which can then be used as a basis for statistical decisions for hypothesis testing.

Tabel no 2 :The Data of Learning Outcomes for Hypothesis Testing

Learning Model Work Attitude	Project Based Learning	Problem Based Learning	Total
Positive	n = 14 \bar{X} = 32 s = 2,41	n = 15 \bar{X} = 28,20 s = 2,91	n = 29 \bar{X} = 29,61 s = 2,97
Negative	n = 17 \bar{X} = 25 s = 2,63	n = 18 \bar{X} = 26,14 s = 4,29	n = 35 \bar{X} = 25,93 s = 3,64
Total	n = 30 \bar{X} = 28 s = 3,84	n = 33 \bar{X} = 27 s = 3,97	n = 63 \bar{X} = 27,59 s = 2,82

Based on the data above, the first data, second and third data research hypotheses were tested using 2 x 2 factorial variance analysis. The summary of the calculation results can be seen in Table 3.

Tabel no 3 : Anava Factorial 2 x 2

Source of variance	Dk	JK	RJK	F _{count}	F _{table (1,60)} (α = 0,05)
Learning Model	1	101.52	101.52	4.53	4.00
Work Attitude	1	1120.64	1120.64	48.93	
Interaction	1	171.27	171.27	7.61	
In the group (within)	60	1348.44	21.64		
Total	63	2763.86			

Because there is an interaction between entrepreneurial-based learning models and work attitudes in influencing the learning outcomes of welding technology, it is necessary to do a further test (post hoc test), to find out the average learning outcomes in which samples are different. To see the form of interaction between entrepreneurship-based learning models and work attitudes in influencing the learning outcomes of welding technology, a further test was conducted using the Tuckey test.

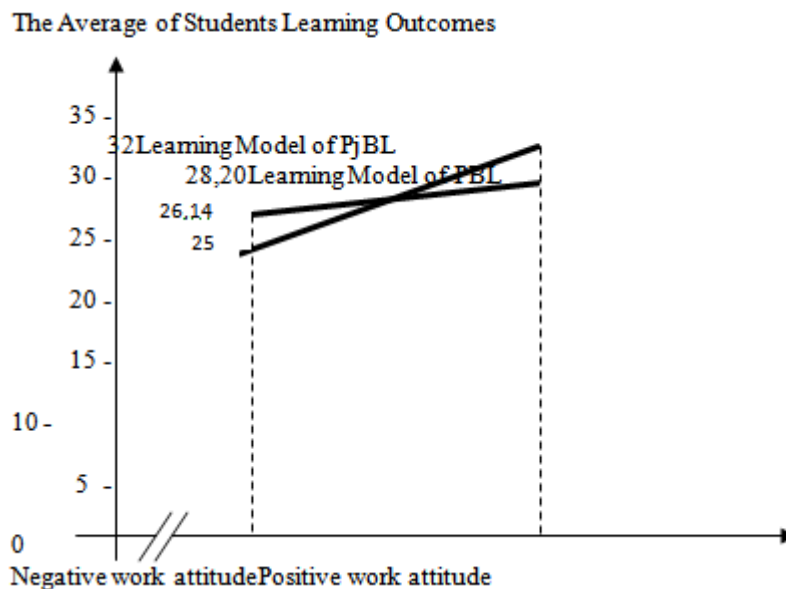
Tabel no 4 : Scheffe test

Statistical Hypothesis		F _{count}	F _{table (3,76)} (α = 0,05)	conclusion
H ₀ : μ _{A1B1} = μ _{A2B1}	H _a : μ _{A1B1} > μ _{A2B1}	7,53	2,73	significant
H ₀ : μ _{A1B1} = μ _{A1B2}	H _a : μ _{A1B1} > μ _{A1B2}	2,74	2,73	significant
H ₀ : μ _{A1B1} = μ _{A2B2}	H _a : μ _{A1B1} > μ _{A2B2}	8,51	2,73	significant
H ₀ : μ _{A1B2} = μ _{A2B1}	H _a : μ _{A1B2} > μ _{A2B1}	5,32	2,73	significant
H ₀ : μ _{A1B2} = μ _{A2B2}	H _a : μ _{A1B2} > μ _{A2B2}	6,34	2,73	significant
H ₀ : μ _{A2B1} = μ _{A2B2}	H _a : μ _{A2B1} > μ _{A2B2}	6,23	2,73	significant

Acceptance criteria if F_{count} > F_{table}, then it is significantly tested. Based on the results of the Scheffe test in the table above it can be seen that there are 6 (six) pairs of statistical hypotheses, namely:

- (a) There are differences in the students learning outcomes of welding technology who are taught by using the project based learning model with positive work attitudes and problem based learning models that have positive work attitudes tested for truth.
- (b) There are differences in the students learning outcomes of welding technology who are taught by using the project based learning model with negative work attitudes and tested for truth.

- (c) There are differences in the students learning outcomes of welding technology who are taught by using the project based learning model with positive work attitudes and problem based learning models that have negative work attitudes tested for truth.
- (d) There are differences in the students learning outcomes of welding technology who are taught by using the project based learning model with negative work attitudes and problem based learning models that have positive work attitudes tested for truth.
- (e) There are differences in the students learning outcomes of welding technology who are taught by using the project based learning model with negative work attitudes and problem based learning models that have negative work attitudes tested for truth.
- (f) There are differences in the students learning outcomes of welding technology who are taught by using the problem based learning model with positive work attitudes and that have negative work attitudes tested for truth.



Picture no 1 : Learning Model Interaction and Work Attitude

IV. Discussion

The use of project based learning models in learning welding technology allows students to interact directly and exercise direct control of information sources, thus enabling students to directly find the information being studied. Learning with the project based learning model when practicing, shows a better curiosity for work, but works hastily. Work through assignments in project based learning can be better learning outcomes if given a direct assessment and given reinforcement and input and shown the results of work that is right and wrong so that students will be better in doing their work

In welding practice instructor explanation refers to the presentation of new academic information which delivery can be done on the implementation of the practice that will be done by students in advanced practice. Learning using the project based learning model, students more quickly get information from the supervisor, because the practice time is shorter in stages. While in the process of using the problem based learning model students take longer to practice, information that is less understood by students from the practice site cannot quickly interact with the mentor, causing forgotten things that are not understood. Interact or exert direct control over sources of information and learning are dominated by field practice counselors (instructors). In the process of presenting learning material can not be done in every sequence (sequence) desired by students.

Learning using the problem based learning model, students are relatively active in carrying out activities and following what is conveyed by instructors in the field. Welding practice work is carried out in accordance with instructor requirements, so students get in-depth information on learning materials that are less effective. Lecturers deliver the material in a structured manner with the expectation that the subject matter delivered can be mastered well by focusing on academic abilities.

Even though the research data obtained that the learning outcomes of student welding technology is higher when taught with the project based learning model than the learning outcomes Student welding technology learned by the problem based learning model, but in practice these two learning models in general have been able to increase understanding and results learning welding technology of students. Thus, it can be

concluded that the learning outcomes of student welding technology learned using a project based learning model are higher than the learning outcomes of student welding technology learned using a problem based learning model.

The results showed that the average learning outcomes of welding technology students who have positive work attitudes with an average of 85.65, higher than the learning outcomes of welding technology students who have negative work attitudes with an average of 78.25. This indicates that students who have positive work attitudes are better able to understand welding technology lessons with a contribution of 67.65%, compared to students who have negative work attitudes with a contribution of 58.48% contribution. Students who have work attitudes usually have the following characteristics: Positive work attitudes and negative work attitudes. A positive work attitude in one's mentality to carry out an activity that is better, faster, more effective and more efficient than the activities carried out previously, especially in learning problems. While negative work attitudes are the limitations of a person to carry out an activity that is better, faster, more effective and more efficient than the activities carried out previously, especially in his learning problems.

Based on the characteristics of the work attitude above, students who have positive work attitudes will obtain higher learning outcomes than students who have negative work attitudes, especially in learning welding technology because learning of welding technology requires patience, perseverance, creativity, motivation and persistence in knowing technology new and its applications that are closely related in daily activity.

The entrepreneurship-based cooperative learning model is a learning strategy that requires direct interaction with the source of learning the material to increase curiosity, interest, creativity, and learning the motivation for students who have positive work attitudes. In line with that for students who have a positive work attitude will be encouraged to be more active in learning and able to control themselves because they are always optimistic to be able to know the welding technology learning materials in daily life and improve learning outcomes. While students who have negative work attitudes might feel worried if they are not able to participate in learning. This happens because work attitudes are lack of motivation to learn, lack of confidence due to not being able to change bad circumstances. Students who have negative work attitudes are also less able to control themselves and pick up on social signals that fill what is desired by others so that communication with teachers in learning does not occur properly which results in diluting student enthusiasm for learning if taught by using a project based model learning.

The problem based learning model is student-oriented learning with material provided in the form of modules so that it is more suitable for students who have negative work attitudes, this is because students who have negative work attitudes tend to passively wait for guidance. Thus lecturers have many opportunities to provide motivation, enthusiasm, and direction so that students are more motivated and encouraged to know and understand information on the application of technology in daily life and improve learning outcomes. However, if the learning model of problem based learning is given to students who have positive work attitudes will lead to an increase. This is due to the learning process having variations in presentation and learning that provides opportunities for students to be active and creative. In this way, the learning outcomes of welding technology for students who have negative work attitudes are higher if they are taught using the problem based learning model compared to students who have negative work attitudes if they are taught using project based learning models. Thus the project based learning model learning is more appropriate to learn to students who have positive work attitudes and learning by using the problem based learning model is more appropriate given to students who have negative work attitudes.

The results of Saerozi's research, Hadromi, Khumaedi [28] on the Project Learning Model and Motivation of Welding Practice Competencies, show that: (1) There is an influence on the use of Ecopreneurship-oriented project learning models on the learning outcomes of Welding practices; (2) There is an influence of learning motivation on learning outcomes of welding practices; (3) There is an effect of the interaction of Ecopreneurship-oriented project learning models and learning motivation together on the learning outcomes of Welding practices.

Research conducted by Supraba and Rahdiyanta [29] shows the results that entrepreneurial knowledge has a positive influence on students' entrepreneurial readiness. This research shows that the more entrepreneurial knowledge students possess, the more ready students are for entrepreneurship. In entrepreneurship learning at school students will understand about attitudes and behavior as an entrepreneur. An entrepreneur must have a high mental attitude, a strong will and never give up. From this attitude it will bring high confidence so that entrepreneurs can determine their business vision. With this vision of the business, entrepreneurs will think creatively and innovatively to achieve their vision.

The results of Nurbaya's research [30] show that entrepreneurial knowledge has a positive effect on entrepreneurial readiness, namely the higher the entrepreneurial knowledge of students, the higher the student entrepreneurship readiness. Students who already have knowledge tend to want to apply what they already know. That knowledge is about entrepreneurship, so he wants to apply his knowledge to the business world and by doing his own business.

The mastery of welding competencies gets second place scores because students' knowledge and skills in welding are obtained from learning on university. Without material students will find it difficult if they go directly into the workforce. Students who have mastered education and training well are well prepared to enter the workforce or become entrepreneurs.

V. Conclusion

The conclusions of the results of this study are as follows:

1. The average of students learning outcomes of welding technology who are taught by the project based learning model are higher than the problem based learning model. In this case students who are taught by using a project based learning model are higher than student learning outcomes who are taught by the problem based learning model.
2. The average of students learning outcomes who have positive work attitudes are higher than students who have negative work attitudes. Thus students who have positive work attitudes get better learning outcomes in welding technology compared to students who have negative work attitudes.
3. There is an interaction between learning models and work attitudes in influencing the students learning outcomes of welding technology.

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