

The Effect of Learning Models and Ability Thinking Creatively on the Outcomes of Learning Course

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Abstract: The aims of the research were: (1) to find out the results of learning the grammar of the student group which was taught using the PjBL learning model and the group of students who were taught using the direct instruction model; (2) to find out the results of learning the grammar of the group of students who have high creative thinking skills higher than the group of students who have low creative thinking abilities; and (3) knowing that there is an interaction between the PjBL learning model and the ability to think creatively in influencing the learning outcomes of dish administration. The method applied in this learning model is Quasi Experiment with 2 x 2 factorial design with Analysis of Variance (Anava). This research was conducted at SMK Negeri 1 Beringin, Deli Serdang Regency, North Sumatra. The population of this study were all students of class XI Catering parallel classes, namely XI TB 1 and XI TB 2. The entire study sample consisted of 56 students. The results of the study show that: (1) PjBL is higher than students who are taught with the direct instruction learning model. (2) The results of learning Tata Dishes among students who have high creative thinking skills are better than students who have low creative thinking abilities; (3) There is an interaction between the learning model and the ability to think creatively on the results of learning serving arrangements.

Keywords: learning models, creative thinking skills, serving arrangements, catering arrangements

1. INTRODUCTION

The Culinary Course subject is one of the subjects that appear in class XI Culinary Course in odd and even semesters, with 12 basic competencies. There are 6 basic competencies in the even semester, namely, (1) analyzing table set-up, (2) evaluating food and drink services, (3) applying hot drinks, (4) making cold drinks (mocktails), (5) implementing telephone calls, (6) implementing order taking for room service. Based on the results of interview observations on January 12, 2022 with teachers who teach cooking at SMK Negeri 1 Beringin, researchers found several problems, including the learning model that was applied tended to be monotonous with one learning model. In the learning process, innovative learning models have not been implemented, while innovative learning is based on a constructivist paradigm, which can help students internalize, reshape, or transform new information.

Transformation occurs through the creation of new understandings which are the result of the emergence of new cognitive structures [1]. So that this results in less attracting students' attention when the teacher delivers the material. Students are less active in participating in the learning process, there are no positive activities carried out by students in learning. Based on these problems the learning model is an important aspect of the learning process. The expected learning objectives of the designed learning model are to build students' habits of active learning by utilizing their potential and using

existing learning resources and facilities, so that they are able to solve problems faced jointly and the results can be accounted for. For this reason, students need to be given the opportunity to learn freely and diversely so that they can increase various interactions between individuals, which in turn can improve the learning process optimally. So, the appropriate learning model to be applied to create an active situation is project-based learning.

In the 2013 curriculum the terms model and approach imply different meanings [2]. The project-based learning model or (PjBL) provides several advantages that will increase student understanding, including students having the opportunity to become "experts" by conducting their research, projects can familiarize students with deeper investigations. PjBL is seen as a learning philosophy that gives teachers the freedom to apply it. Project basic steps to prepare and realize the work namely; (a) preparatory work, (b) background reading, c) literature search, (d) realization, (e) reports, (f) presentations, (g) discussions, (h) conclusions [3].

The PjBL learning model is a learning model that involves students in activities that provide opportunities for students to work autonomously solving problems and constructing their own learning and ultimately producing valuable and realistic student work [4]. According to Sutirman [5] states that, "project-based learning is a learning model to produce real products or projects in which students play an active role". In

line with this opinion, Rusman [6], states that, "project-based learning is a learning model that is supported by or based on constructivist learning theory". The theory requires students to build their own knowledge through the experiences they get.

1.1 The Nature of Learning and Learning

Learning means a learning process that occurs because of the existence of teachers as teachers and educators and the presence of students or students as those who are taught or as recipients of knowledge or skills. In general, the term learning is interpreted as an activity that results in a change in behavior. With this understanding, learning can be interpreted as an activity carried out by the teacher in such a way that the behavior of students changes in a better direction [7].

Learning is a set of events (events) that affect students in such a way that students get convenience (Briggs, 1992). This set of events builds a learning that is internal if students carry out self-instruction and on the other hand it may also be external, that is, if it comes from, among other things, the educator. So teaching is only a part of instruction, as a form of learning. The main element of learning is the child's experience as a set of events so that the learning process occurs.

1.2 Learning Outcomes of Dishes

Learning outcomes are the most important part of learning. Sudjana [9] states that learning outcomes are the abilities possessed by students after they receive their learning experience. Learning outcomes are also the results of students after carrying out a series of learning activities which are then evaluated by exams. What is meant in this study is student learning outcomes in the form of scores.

According to Sardiman [10] "learning outcomes are real abilities which are the result of interactions between various factors that influence both internal and external individuals in learning." According to Gagne's thinking (in Suprijono [11]) learning is patterns of action, scores, understanding, attitudes, appreciation and skills learning outcomes in the form of: (1) Verbal information, namely the capacity to express knowledge in the form of language, both spoken and writing; (2) Intellectual skills, namely the ability to present concepts and symbols; (3) Cognitive strategies, namely skills and directing their own cognitive activities; (4) Motor skills, namely the ability to carry out a series of physical affairs and coordination, so that it is realized; (5) automatism of physical movement; and (6) Attitude is the ability to accept and reject objects based on the score on the object.

Riegeluth [12] classifies learning outcomes into 3 (three) aspects namely: (1) learning effectiveness, (2) learning efficiency, (3) learning attractiveness. Aspects of learning effectiveness are usually measured by the level of student achievement at predetermined learning goals, efficiency is usually measured by the ratio between effectiveness and the amount of time and/or cost used, while the attractiveness aspect of learning is usually measured by the tendency of students to keep/continue learning (in Uno, 2014).

Scores of learning outcomes are all kinds of procedures used to obtain information about student performance or how far students can achieve the learning objectives that have been set [14]. There are several ways that can be used to collect evidence of student learning progress, namely: (a) Scoring portfolios, (b) Scoring through performance, (c) Scoring through assignments, (d) Scoring through work results, and (e) Escort through a written test.

The test is a research data collection method that serves to measure a person's ability. Tests can be used to measure

abilities that have right or wrong responses/answers. In the field of education, tests are usually carried out to measure academic achievement and vocational competence. Learning achievement can be measured by various types of tests, namely written tests, oral tests and tests for work [15].

The forms of tests used in educational institutions can be categorized into two, namely objective tests and non-objective tests. The forms of objective tests that are often used are multiple choice, true-false, matching, and objective descriptions [16].

A multiple choice test is a test whose answers can be obtained by selecting alternative answers that have been provided. In this multiple choice test, the form of the test consists of: statements (subject matter), alternative answers that include answer keys and distractors. Statements (subject matter) are sentences that contain information or notifications about a particular material that are incomplete and must be supplemented by selecting the available alternative answers. The answer key is an alternative answer which is the correct choice which is the desired answer, while the distractor is an alternative that is not an answer key [17].

The term Tata Dish is very beautiful to hear, and is commonly used by many people. The meaning of the Tata Serving itself when viewed from the meaning of each word is Tata which means arranging to beautify, and Dish means food and drinks served to guests or consumers. So we can conclude that the Tata Serving is a way of preparing food to beautify the food and drinks served to guests or consumers (2013 curriculum implementation module).

As is well known, Food and Beverage Department is part of the Food and Beverage Department which basically directly supports and carries out all the functions of the Food and Beverage Department. The catering department can generally be defined as one that handles eating and drinking. Whereas specifically, it is part of a hotel or a place that manages and is responsible for food and beverage services and other needs tied to the hotel or place in a commercial and professional manner. However, separately it can be seen that the main duties or main functions of Governance Dish is "provide food and beverage service".

1.3 The essence of the Project Based Learning Model

Project Based Learning or PjBL is an effective approach that focuses on creative thinking, problem solving and student interaction among their peers to create projects and use new knowledge. PjBL is a learning model that uses projects/activities as a learning process to achieve competency attitudes, knowledge and skills. PjBL is a learning model that provides opportunities for teachers to manage learning in class by involving project work. PjBL uses problems as a first step in gathering knowledge based on students' experiences in real activities. PjBL is designed to be used on complex issues that are required in conducting investigations [18].

PjBL is a teaching method by organizing teaching materials in such a way that they form a whole or unified whole that is meaningful and contains a subject matter. The project method is rarely used by teachers, because in practice it requires sufficient preparation and takes a long time to complete. However, this method has a very important and beneficial advantage for students, namely getting students used to working scientifically [19].

The PjBL model can be applied at various levels of education starting from Elementary School (SD), Junior High School (SMP), to Vocational High School (SMK), but it is still used in accordance with KD in the material. Learning about table setting, especially table set up. Students can work directly in the field and students are required to develop new knowledge, creative thinking patterns and ways to find solutions to existing problems. The success of students in making work/projects as the final result will give pride to students and will motivate students to move forward in the next project, so that students are indirectly able to develop their concepts from the various scientific fields they have studied. According to Alamaki, apart from being carried out collaboratively, projects must also be innovative, unique and focus on solving problems related to learning or the needs of the community or local industry [20]

Project-Based Learning or PjBL is student-centered learning, can be interdisciplinary in nature (subject integration), and long-term. Usually PjBL is related to the discussion of real problems. In the 2013 Curriculum Implementation module (2014) it is explained that PjBL is a learning model that uses projects or activities as the core of learning. Students explore, interpret, synthesize, and collect information to produce various forms of learning outcomes. PjBL is a learning model that uses problems as a first step in gathering and integrating new knowledge based on experience in real activities. Through PjBL the inquiry process begins by raising a guiding question and guiding students in a collaborative project that integrates various subjects or materials in the curriculum.

1.4 Direct Instruction learning model

The direct instruction model was first introduced in 1968 by Siegfried Engelman. He uses this approach to help children learn and master subject matter. This approach was successful in increasing student learning outcomes, regardless of their economic background. Direct instruction is a learning model specifically designed to support student learning processes related to well-structured declarative knowledge and procedural knowledge that can be taught with a gradual pattern of activities, step by step. "Direct instruction is a learning model that consists of teacher explanations of new concepts or skills to students."

The Direct instruction learning model there are five very important phases. The model syntax is presented in five stages, including: (1) Phase 1: Orientation / Delivering Objectives In this phase the teacher provides a lesson framework and orientation to the subject matter. Activities in this phase include: (a) Preliminary activities to determine knowledge that is relevant to the knowledge that students already have. (b) Delivering learning objectives. (c) Give an explanation or direction regarding the activities to be carried out. (d) Inform the material or concept that will be used and the activities that will be carried out during learning. (e) Inform the lesson framework f) Motivate students. (2) Phase 2: Presentation/Demonstration In this phase the teacher can present subject matter, either in the form of concepts or skills. This framework includes: a) Presentation of material in steps b) Providing examples of concepts c) Modeling/demonstration of skills d) Re-explaining things that are considered difficult or poorly understood by students (3) Phase 3: guided practice In this phase the teacher plans and provides guidance to students to do the initial exercises. The teacher provides reinforcement for the correct student response and corrects the wrong one. (4) Phase 4: Checking Understanding and Providing Feedback In the next phase, students are given the opportunity to practice

concepts and skills and apply the knowledge or skills to real-life situations. This guided exercise is also good for teachers to access students' abilities in carrying out assignments, check whether students have successfully carried out tasks properly or not, and provide feedback. The teacher monitors and provides guidance if necessary. (5) Phase 5: Independent Practice Students carry out exercise activities independently. This phase can be passed by students well if they have mastered the stages of doing assignments 85% - 90% in the guided practice phase. The teacher provides feedback for student success.

1.5 The Nature of Creative Thinking Ability

The ability to think creatively is an ability that involves intelligence that develops within individuals, in the form of attitudes, habits, and actions in creating something new and original to solve problems [24]. The ability to think creatively can be raised if students are given the opportunity to think of new ideas [25]. According to the Ministry of National Education, creative thinking is thinking about doing something by producing a way or result of something you already have. Class indicators of creative thinking are creating learning situations that foster creative thinking and acting as well as giving assignments that challenge the emergence of new, authentic and modified works.

According to Wallas, as explained by Satiadarma & Waruwu [26], creative thinking is a thinking process that has steps: (1) preparation, (2) incubation, (3) illumination, and (4) verification. In the preparation step one tries to collect various kinds of information that is relevant to the problem at hand. In the incubation step, a person deliberately temporarily does not think about the problem to which the solution is being sought. In the illumination step, an idea or solution plan has been found. However, these ideas are usually still in the form of main ideas or outlines. The final step is verification, which is evaluating or re-confirming that the answer to the problem is correct, and then implementing the ideas found. If successful then the creative thinking process is complete.

Hurlock, as revealed by Satiadarma & Waruwu [27], suggests several conditions that can improve children's creative thinking skills, including: time given to children to think; a chance to be alone to think; facilities that support students' creative thinking; stimulating environment; less possessive parent and child relationships; democratic way of educating children; opportunity to acquire knowledge; conducive classroom setting; a pleasant teaching atmosphere; mature teacher preparation; the attitude of teachers who give freedom to students to be creative; and student-centered teaching methods. The research problems are as follows: (1) Is the result of learning the grammar of the group of students who are taught using the PjBL learning model higher than the group of students who are taught using the direct instruction / Direct Instruction model?; (2) Are the learning outcomes of the group of students who have high creative thinking skills higher than the group of students who have low creative thinking abilities?; and (3) Is there an interaction between the PjBL learning model and the ability to think creatively in influencing the learning outcomes of dish administration?

2. METHOD

This research was conducted at SMK Negeri 1 Beringin Kec. Banyan tree, Deli Serdang Regency, North Sumatra. The population of this study were all students of class XI Catering at SMK Negeri 1 Beringin which consisted of 2 parallel classes, namely XI TB 1 and XI TB 2. From the population of

class XI SMK Negeri 1 Beringin, one class was determined as a sample for the treatment of the PjBL learning model, namely class XI TB I. and one class as a sample to treat the direct learning model, namely class XI TB 2. The entire study sample consisted of 56 students.

The method applied in this learning model is a Quasi Experiment with a 2 x 2 factorial design. Through this design, we compare the effect of the PjBL learning model and the direct learning model on the Learning Outcomes of Tata Dish in terms of creative thinking ability. The research design is then included in the study in Table 1.

Table 1. 2 x 2 Factorial Design Experiment

Learning model (A)	Project based Learning (A_1)	Direct Learning Model (A_2)
Ability Creative Thinking (B)		
Height (B_1)	$(\mu A_1 B_1)$	$(\mu A_2 B_1)$
Low (B_2)	$(\mu A_1 B_2)$	$(\mu A_2 B_2)$

The data analysis technique used is descriptive and inferential statistical techniques. Descriptive statistical techniques are used to describe the data, including: the average value, median, standard deviation and trend of the data. The inferential statistical technique was used to test the research hypothesis, where the inferential technique to be used was the two-way Anava analysis of variance technique (2x2 factorial design) with a significant level of $\alpha = 0.05$. Before the two-way anava was carried out, the analysis requirements were first determined, namely the normality requirements using the Liliefors test, while the Homogeneity requirements test used Fisher's test (F) and Barlett's test at 5% significance level. Fisher's test was used to test the homogeneity of each sample group (treatment), while Barlett's test was used to test the homogeneity of the sample group (treatment) together.

After testing the analysis requirements, then a two-way Anova test was carried out. If it turns out that the interaction is significant, then a further test is carried out to find out the comparison between cells, then if the sample size of each cell in this research design is the same, then it will be continued with the Tukey test. Furthermore, if the sample size of each cell in the research design is not the same, then the Scheffe test will be continued. For the purposes of testing the hypothesis, the statistics are formulated as follows:

First Hypothesis:

$$H_0 : \mu A_1 = \mu A_2$$

$$H_a : \mu A_1 > \mu A_2$$

Second Hypothesis:

$$H_0 : \mu B_1 = \mu B_2$$

$$H_a : \mu B_1 > \mu B_2$$

Third Hypothesis:

$$H_0 : A > < B = 0$$

$$H_a : A > < B \neq 0$$

3. RESULTS AND DISCUSSION

3.1 RESULTS

The following is presented sequentially descriptive data regarding: (1) the learning outcomes of students who have high

creative thinking skills, (2) the learning outcomes of students who have low creative thinking skills, (3) the learning outcomes of students who are taught dishes with PjBL learning model and have high creative thinking skills, (4) student learning outcomes taught by PjBL learning model and have low creative thinking ability, (5) student dish learning outcomes taught by direct instruction learning model and have the ability to think high creative, (6) learning outcomes of students who are taught with the direct instruction learning model and have low creative thinking ability.

Table 2. Summary of Descriptive Analysis Calculation Data

Data Summary		Learning models		Total
		PjBL	direct learning	
Creative Thinking Ability	Tall	N = 15 $\sum X = 580$ $\sum X^2 = 22476$ $\bar{X} = 38,67$	N = 13 $\sum X = 452$ $\sum X^2 = 15792$ $\bar{X} = 34,77$	N = 28 $\sum X = 1032$ $\sum X^2 = 38268$ $\bar{X} = 36,72$
	Low	N = 15 $\sum X = 515$ $\sum X^2 = 17747$ $\bar{X} = 34,33$	N = 13 $\sum X = 427$ $\sum X^2 = 14183$ $\bar{X} = 32,85$	N = 28 $\sum X = 942$ $\sum X^2 = 31930$ $\bar{X} = 33,59$
Total		N = 30 $\sum X = 1095$ $\sum X^2 = 40223$ $\bar{X} = 36,50$	N = 26 $\sum X = 879$ $\sum X^2 = 29975$ $\bar{X} = 33,81$	N = 56 $\sum X = 1974$ $\sum X^2 = 70198$ $\bar{X} = 35,16$

For the purposes of testing the hypothesis using the 2x2 factorial two-way analysis of variance (ANOVA) technique and Tukey's follow-up test, the average value of each group is needed. The summary of learning outcomes data can be seen in Table 2 above by using descriptive analysis. After the table data above is processed with ANOVA 2 factorial path 2x2, the results of the analysis are obtained as shown in Table 3.

Table 3. Summary of 2x2 Factorial ANOVA Calculation Results

Source of Variance	JK	dk	RJK	Fcount	Ftable
Between Columns	100,96	1	100,96	15,06	4,02
Between Lines	144,64	1	144,64	21,58	
Interaction	40,21	1	40,21	6,001	
Error	368,21	52	6,7	-	
TOTAL	654,02	55	-	-	

Based on the summary above, the hypothesis testing is detailed as follows:

First Hypothesis

Testing the first hypothesis, namely: student learning outcomes taught using the PjBL learning model are higher than students taught using the direct instruction learning model.

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

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

From the results of the data analysis, it was found that the average learning achievement for cooking procedures for students who were taught using the PjBL learning model was 36.50 and the average learning achievement for serving dishes for students who were taught using the direct instruction learning model was 33.81. Based on Anava calculations, it is obtained $F_{count} = 15.06$ while the value of $F_{table} = 4.02$ so that H_0 is rejected. Thus it can be concluded that the learning outcomes of students who are taught with the PjBL learning model are higher than students who are taught with the proven direct instruction learning model.

Second Hypothesis

Testing the second hypothesis, namely the learning outcomes of students who have high creative thinking skills are higher than students who have low creative thinking abilities. The statistical hypothesis is:

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

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

From the results of data analysis, it was found that the average learning achievement of students who had high creative thinking skills was 36.72 and the average learning achievement of students who had low creative thinking skills was 33.59. based on anava calculations obtained $F_{count} = 21.58$ while the value of $F_{table} = 4.02$ for dk (1.52) and a significance level of 5%, it turns out that the value of $F_{count} = 21.58 > F_{table} = 4.02$ so that H_0 is rejected. Thus it can be concluded that the learning outcomes of students who have high creative thinking skills are higher than students who have low creative thinking abilities.

Third Hypothesis

Testing the third hypothesis, namely: there is an interaction between the learning model and the ability to think creatively on student cooking learning outcomes.

$$H_0 : \mu_A > < \mu_B = 0$$

$$H_a : \mu_A > < \mu_B \neq 0$$

Based on data analysis, it was found that the average value of the learning outcomes for students who were taught using the PjBL learning model who had high creative thinking skills was 38.67 and the average learning outcomes for students who were taught using the PjBL learning model who had low creative thinking abilities of 34.33. Furthermore, the average learning outcomes for students who were taught using the direct instruction learning model who had high creative thinking skills were 34.77 and the average learning outcomes for students who were taught using the direct instruction learning model who had low creative thinking skills were 32.85.

Based on Anava calculations, the F count is 6.001 while the F table is 4.02 for dk (1.52) with a 5% significance level, it turns out that the F count is $6.001 > F_{table} 4.02$ so H_0 is rejected. Thus it can be concluded that there is an interaction between the learning model and students' creative thinking abilities towards proven correctness of the learning outcomes of the

dishes. The complete calculation can be seen in Appendix 21. The following interaction can be presented in Figure 1.

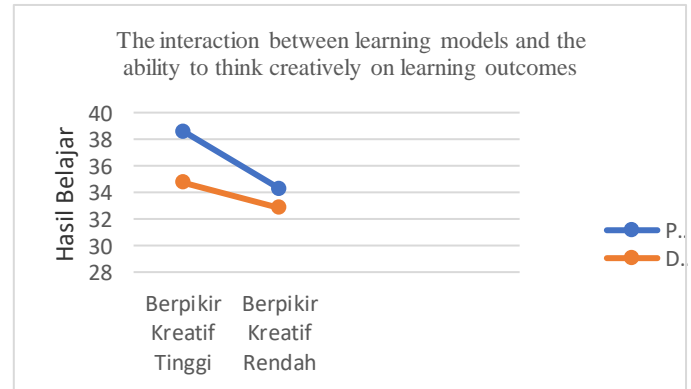


Figure 1. The interaction of learning models and the ability to think creatively on student cooking learning outcomes

By testing significantly the interaction between the learning model and cognitive style on the serving arrangement, further tests were carried out. Due to the same number of samples (n) in each group, a further test was carried out using the Tukey Test. The results of the advanced test calculations for each compared group are presented in Table 4.

Table 4. Summary of the Tukey Test

No.	Group	Uji Tukey	
		Qh	Qt = 0.05
1	A1B1 with A2B1	26,89	2.83
2	A1B1 with A2B2	40,13	
3	A1B1 with A1B2	29,93	
4	A1B2 with A2B1	-3,03ts	
5	A1B2 with A2B2	10,2	

Based on the results of the pilot test with the Tukey test above, it can be concluded that of the six test combinations, there are four follow-up tests which show significant results and two follow-up tests which show insignificant results, namely: taught with the PjBL learning model and have high creative thinking skills significantly different from the learning outcomes of students taught using the direct instruction learning model and have high creative thinking skills, (2) The learning outcomes of students taught using the PjBL learning model and have the ability high creative thinking is significantly different from the learning outcomes of students who are taught using the direct instruction learning model and have low creative thinking skills, (3) The learning outcomes of students who are taught using the PjBL learning model and have the ability to think creatively t High is significantly different from the learning outcomes of students who are taught using the PjBL learning model and have low creative thinking skills. who are taught with the direct instruction learning model and have high creative thinking skills, (5) The learning outcomes of students who are taught with the PjBL learning model and have low creative thinking abilities are different from the learning outcomes of students who are taught with the direct instruction learning model and have low creative thinking ability, (6) student learning outcomes taught by direct instruction learning model and have high creative thinking skills are different from student dish learning

outcomes taught by direct instruction model instruction and have low creative thinking ability

3.2 DISCUSSION

In the previous presentation it was known that the overall average learning outcomes for students taught using the PjBL learning model were higher than the average learning outcomes for students taught using the direct instruction learning model. this shows that the PjBL learning model has proven to be effective in improving overall student learning outcomes for both students who have high creative thinking skills and those who have low creative thinking skills. the results of these findings indicate that it is better to use the PjBL learning model to teach dishes than the direct instruction learning model.

This is in line with the expression Zulfiani, Tonih Feronika, Kinkin Suartini [28] which defines PjBL as a teaching method by organizing teaching materials in such a way that they form a whole or a unified whole which is meaningful and contains a subject matter. The PjBL model learning process is not just working together in a group but the emphasis is more on a learning process that involves a complete and fair communication process in the classroom. The application of the PjBL learning model is an alternative for students in class.

If it is further observed that in the PjBL learning model, the average learning outcomes for students who have high creative thinking skills are higher than the learning outcomes for students who have low creative thinking abilities. Whereas in the direct instruction learning model, the average learning outcomes of students who have high creative thinking skills are higher than the learning outcomes of students who have low creative thinking skills. This shows that students who have high creative thinking skills are significant for differentiating student learning outcomes, where students who have high creative thinking skills are better taught by discovery learning models, as well as students who have high creative thinking skills are better. by being taught with the direct instruction learning model. The results of the study show that all the research hypotheses that the researchers propose are acceptable.

This is acceptable because through the PjBL learning model it can encourage students to be active in learning because students are stimulated to actively observe, adjust between theory and reality, and can try to do it themselves. Besides that, the application of the PjBL learning model presents a concept of a learning model that involves students in carrying out a project so that students easily and quickly understand a material, and if students' understanding increases, they get better grades and learn faster so that schools will be easier. If they have experienced the learning process by involving a project in a lesson, they will easily understand the material. The application of the PjBL learning model is an alternative for students in class. The project-based learning model (Project Based Learning) provides opportunities for students to explore material using various methods and conduct experiments collaboratively with the aim that students have independence in completing the tasks they face

This proves students' creative thinking ability in learning is significant for differentiating dish learning outcomes. Students' creative thinking ability in this study was categorized into two categories, namely high creative thinking ability and low creative thinking ability. From the results of the overall data analysis, it was found that the average learning ability of students who had high creative thinking ability was higher than students who had high creative thinking ability. low creative

thinking. Thus students with high creative thinking skills understand and master the course material better than students with low creative thinking abilities. This is in line with the results of Payong's research [29] which proves that for students who have high creative thinking skills, the PjBL learning model has a high influence on learning outcomes compared to the direct instruction learning model.

Based on the average learning outcomes of dishes for students with high creative thinking skills who are taught with the PjBL learning model is higher than the average learning outcomes for students with low creative thinking skills who are taught with the direct instruction learning model. Then the average learning outcomes for dishes on students who have low creative thinking skills who are taught using the direct instruction learning model are higher than the average learning outcomes for students who have low creative thinking skills who are taught using discovery learning models.

Furthermore, based on data analysis, it was found that the average learning outcomes of students who had high creative thinking skills who were taught using the PjBL learning model were higher than the learning outcomes of students who had low creative thinking abilities who were taught using the direct instruction learning model. This means that the PjBL learning model and high creative thinking skills are more effective than using the direct instruction learning model, because through the discovery learning model, students directly experience the process of acquiring knowledge, thus motivating students to learn.

The average learning outcomes of students who have high creative thinking skills who are taught using the discovery learning model are higher than students who have low creative thinking skills who are taught using the discovery learning model. This means that the PjBL learning model is more effective for improving the learning outcomes of cooking grammar for students who have high creative thinking skills compared to students with low creative thinking abilities, because students who have high creative thinking skills are students who always use the potential to think high. exist in him in solving problems in learning activities.

The average learning outcomes for students with high creative thinking skills who are taught using the PjBL learning model are higher than students with low creative thinking skills who are taught using the direct instruction learning model. This is because students who have high creative thinking skills tend to try to complete the assignments given with their abilities to study the teaching materials contained in the dishes.

4. CONCLUSION

1. The learning outcomes of students who were taught with the PjBL learning model were higher than students who were taught with the direct instruction learning model.
2. The results of learning Tata Dishes among students who have high creative thinking skills are better than students who have low creative thinking abilities.
3. There is an interaction between the learning model and the ability to think creatively on the results of learning Tata dish. The learning outcomes of Tata Diang students who are taught with the PjBL learning model and have high creative thinking skills are better than students who have low creative thinking skills. Meanwhile, students' learning outcomes for serving dishes were taught using the direct instruction learning model and had higher creative thinking skills than students who had low creative thinking skills.

Thus, students who have high creative thinking skills are better taught using the PjBL learning model and students who have high creative thinking skills are better taught using the direct instruction learning model.

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