

The Effect of Problem Based Learning Models and Levels of Creativity Toward Student Outcomes in Vocational High School

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ABSTRACT

This study aims to determine the level of creativity of students who are taught using problem based learning models and students who are taught using direct learning models. To find out the learning outcomes of students who have a high level of creativity and creativity level of creativity is low. The method used in this study is Quasi Experimental. The design used is a 2x2 factorial design, because this design can be used to see student learning outcomes before administering treatments and after giving treatments. The results of the study found: (1) the level of creativity of students who study using a learning model based on higher learning outcomes compared to students who learn with the direct learning model; (2) student learning outcomes with a high level of creativity, significantly higher than students who have low levels of creativity; and (3) there is an interaction between the use of learning models and the level of creativity on student learning outcomes. This study concludes that: (1) problem based learning models can improve student creativity; (2) students who have a high level of creativity, higher learning outcomes than students who have low levels of creativity; and (3) there is an interaction between the use of learning models and the level of creativity on student learning outcomes.

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1. INTRODUCTION

The application of efficient learning models at Vocational Schools is used to improve skills and develop creative thinking that can explore students' potential. The main goal is of course that the student learning outcomes are better, higher than the previous learning outcomes, so as to create skilled and innovating graduates.

The position of the teacher as a facilitator, must be able to inspire, design and develop a variety of appreciation for the fields involved. The above skills are in accordance with the regulations of the Ministry of Education and Culture (2017) which state 21st century skills or which are termed 4C namely Creative, Critical Thinking, Communicative and Collaborative.

This skill aims to achieve success and improve students' skills and learning outcomes. Creative described in the 21st century is that students are good at creating new ideas and able to develop creative ideas, while the explanation of Critical Thinking is that students are able

to understand complex problems and be able to find solutions. Explanation from Communication is that students are able to apply good communication, while Collaborative is students able to unite potential in group members to achieve learning goals.

One of the 21st century skills competencies associated with this research is creativity and innovation. Some of these skills include: (1) having the ability to develop, implement, and deliver verbally or in writing; (2) being open and responsive to new and different perspectives; (3) able to express conceptual and practical creative ideas; (4) use their concepts or knowledge in new and different situations both in related subjects, between subjects and in contextual issues; (5) use failure as a learning vehicle; (6) have the ability to create renewal based on their prior knowledge; and (7) able to adapt to new situations and make a positive contribution to the environment (Ministry of Education and Culture, 2017).

The development of creativity and innovation in this study was to make a presentation design. These development efforts can be obtained from experience or knowledge, based on natural phenomena and other inspirational images that are adjusted between color character, material texture and fashion style. Sinha (2002) in his research entitled "Creativity in fashion", concluded that creativity is the most important part of the strategy of designing clothes with the aim of exploring insights to produce creative designs.

Creativity is considered as a high-level problem solving by fashion designers to increase company production, make varied samples and apply classical styles. Future changes to be gained from creativity include: being able to explore new trends, analyze and predict new trends, skills to bring new ideas into making fashion drawings and sketches. Based on this, the learning model that is applied to make the design of the dish should be able to increase high creativity to produce a variety of creative and unique presentation designs.

2. METHODS

This study used a quasi-experimental research method. In experimental research there is treatment (treatment) that is used to find the effect of certain treatments on others in controlled conditions (Sugiyono, 2015: 109). The experimental research method in this study aims to determine the differences in learning outcomes in the Basic Design subjects, as well as the use of learning models namely problem based learning models and direct learning models.

According to Sugiyono (2015: 110), there are several forms of experimental design that can be used in research, namely Pre-Experimental Design, True Experimental Design, Factorial Design, and Quasi Experimental Design. In this study using a factorial design (Factorial Design), namely by paying attention to the existence of moderator variables that influence treatment (Independent Variables) on learning outcomes (Dependent Variables). The design of the 2 x 2 factorial design can be seen in Figure 1.

2.1 Factorial Design 2x2

| | | | | |
|---|----------------|----------------|----------------|----------------|
| E | O ₁ | X ₁ | Y ₁ | O ₃ |
| | | | Y ₂ | O ₄ |
| K | O ₂ | X ₂ | Y ₁ | O ₅ |
| | | | Y ₂ | O ₆ |

Figure 1. Factorial Design Research 2x2
Source: Sugiyono (2015: 115)

Information:

E = Experimental Class

K = Control Class

O_{1,2} = Pre-test

O_{3,4,5,6} = Post-test

X₁ = Treatment in the experimental class (taught with MPBM)

X₂ = Treatment in the control class (taught with MPL)

Y₁ = High creativity level

Y₂ = Low creativity level

2.2 Statistical Data Analysis

Data Analysis of Covariance (ANCOVA) was used to analyze significant in different level of treatment with probability 5%.

3. RESULTS AND DISCUSSIONS

3.1 Level of creativity of students if taught using problem based learning models.

Problem based learning model is a learning strategy that requires students to learn more actively and think creatively, so that it can help develop the ability to think and improve intellectual skills. Problem-based learning models that are student-centered, provide opportunities for them to improve creativity, solve problems independently or collaboratively. The role of the teacher in this learning, as a facilitator who guides learning activities and helps direct students to achieve self skills.

The learning model that is applied to the students of Fashion Vocational School, especially on Basic Design subjects, should use learning practices that can explore creative ideas. In addition, the learning model is expected to be able to train students' independence in making presentation designs and enhance creativity in the field of clothing. This has implications for the quality of human resources in the field of vocational education, especially the Department of Clothing and other fields that want graduates with high level creativity skills.

The application of problem based learning models that are used in the teaching and learning process, helps students understand all presentation design design techniques, so that students can increase the creativity of the higher. Students who learn to use a problem-based learning model, will be more active and creative when compared to students who study using the direct learning model. This is because, activities in the problem based learning model in the Basic Design subjects include: (1) emphasizing meaning, not facts. Change the lecture model with discussion in a group involving all students in the group; (2) increase self-direction, ie students will strive to find solutions to their problems and be more responsible for learning design offerings; (3) students' understanding is higher and increases creativity in making presentation designs; (4) interpersonal skills and teamwork; (5) self motivating attitude; (6) tutor relations between students; and (7) improve learning outcomes.

Table 1. Creativity using Problem Based Learning Models

| Learning Models | Mean | Std. Error | 95% Confidence Interval | |
|-----------------|--------|------------|-------------------------|-------------|
| | | | Lower Bound | Upper Bound |
| PBL | 84.638 | .542 | 83.553 | 85.723 |
| DI | 83.066 | .542 | 81.981 | 84.151 |

3.2 Learning outcomes of students who have a high level of creativity and students who have low levels of creativity

Students with high kindergarten will be able to solve problems in a way that is efficient and fast compared to other students. Examples of problems given during the learning process, have a very good impact on improving learning outcomes. The learning model used must be able to be oriented to problem solving and also train students to improve creativity.

Students who have a high kindergarten with a suitable learning model, will produce extraordinary answers or solutions to a problem faced by students. Fluency dimensions, flexibility and originality which are indicators of the level of creativity are very influential in solving a problem. Students who are able to solve problems according to conditions and data in the field, will get high learning outcomes.

Students with kindergarten are high, able to find relevant information, conduct analysis, evaluate research results and be able to draw conclusions. In addition, students with high-level kindergartens are able to develop alternative solutions to problem solving based on the knowledge and understanding gained. Based on this, students who have high kindergarten will get better learning outcomes than students who have low kindergarten.

Students with high Creativity tend to do: (1) make a sentence using a relatively large number of words; (2) sentences written differently from other students; and (3) the written sentence looks interesting.

Students with low kindergarten tend to solve problems with the methods used to use. Examples of problems given in the learning process have a good impact on improving learning outcomes. Students who have low creativity level do not mean students who cannot solve problems. Students who are in the low creativity level category often get a unique solution, but they are not able to finish correctly.

The lack of knowledge, the inability to make sentence structure and the application of inappropriate learning models, resulted in them being included in the low creativity level category. Students with low kindergarten, tend to: (1) less skilled at developing sentences; (2) sentences written relative to the previous sentence; (3) less able to make interesting sentences.

The learning model used must be oriented to problem solving and also train students to improve creativity even in students who have low kindergarten. Problem based learning is one of the learning approaches used to stimulate increased creativity of students in problem-oriented situations, including learning to multiply alternative solutions from various learning resources.

Table 2. Learning outcomes of student high and low creativity

| Creativity Level | Mean | Std. Error | 95% Confidence Interval | |
|------------------|--------|------------|-------------------------|-------------|
| | | | Lower Bound | Upper Bound |
| Low | 82.373 | .542 | 81.288 | 83.458 |
| High | 85.330 | .542 | 84.245 | 86.415 |

3.3 There is an interaction between the use of learning models and the level of creativity on student learning outcomes

Factorial design provides the possibility to assess the interaction between the two independent variables, namely the different influence of one variable at a different level from the other variables. If interactions occur, then the effect of treatment on learning outcomes at both levels of creativity will be different. If there is no interaction, the effect of the treatment of learning outcomes will be the same for both levels of student creativity.

Students who have high creativity if taught with a problem based learning model, the learning outcomes will be high. The acquisition of high learning outcomes is caused because the learning model presents contextual problems, so it can stimulate students to learn and work in teams to solve real-world problems. Conversely, if students are taught with a direct learning model, the learning outcomes are low.

The acquisition of learning outcomes is low, because it uses teacher-centered demonstrations to teach certain skills to students. Teacher-centered demonstration that starts from preparing and motivating students, demonstrating, providing guided training, feedback and providing advanced training.

Students with high creativity, tend to do: (1) always be creative to produce interesting serving designs; (2) always think of creating new ideas in accordance with prevailing trends; (3) always experimenting with collaborating old elements into something new; (4) stylizing or developing simple designs; and (5) easy to find inspiration. Students who have a high level of creativity, if given a learning model based on the problem, the learning outcomes will be high. Learning that involves students on real problems will be able to help develop students' thinking abilities, whereas if given a direct learning model, the learning outcomes will be low. This is because the management of teacher-centered learning, so students are only passive and waiting for instructions from the teacher.

Furthermore, students who have low kindergarten if taught with a problem based learning model, the learning outcomes will be low. The acquisition of low learning outcomes occurs, because learning that presents contextual problems to solve real world problems (real work). Students who are not fluency, flexible and originality in solving problems, will have difficulty in following the learning model that is needed in problem solving.

Conversely, if students are taught with a direct learning model, the learning outcomes are high. This happens because learning is teacher-centered to teach certain skills, so students are more focused in accepting explanations from teacher demonstrations and obtaining high learning outcomes.

Students with low creavity, tend to do: (1) lazy to be creative to produce interesting serving designs; (2) lack of thinking to create new ideas for making presentation designs; (3) less like experimenting with collaborating old elements into something new; (4) less able to do stylation or development on a simple design; and (5) difficult to find inspiration.

Then, for students who have low levels of creativity, if given a problem based learning model, the learning outcomes will be low. Low learning outcomes are caused because students find it difficult to solve problems independently, whereas if given a direct learning model, the learning outcomes will be high. This is due to the use of learning models that depend on the teacher, making students not think too much about problem solving.

Table 3. Interaction between use of learning models and the level of creativity on student learning outcomes

| Source | Type III Sum of Square | df | Mean Square | F | Sig. |
|--|------------------------|----|-------------|---------|------|
| Corrected Model | 206.954 | 2 | 103.477 | 10.646 | .000 |
| Intercept | 1038.080 | 1 | 1038.080 | 106.800 | .000 |
| Tingkat Kreativitas Model Pembelajaran | 42.357 | 1 | 42.357 | 4.358 | .041 |
| Error | 554.030 | 57 | 9.720 | | |
| Total | 42489.000 | 60 | | | |
| Corrected Total | 760.938 | 59 | | | |

4. CONCLUSION

- Problem based learning models can improve student creativity
- Students who have a high level of creativity, higher learning outcomes than students who have low levels of creativity
- There is an interaction between the use of learning models and the level of creativity on student learning outcomes.

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