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The Effect Of Project Based Learning On Creative Thinking Skills For Teachers

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Abstract :
The success of a program is closely related to the quality of the plans made. The inability of someone to plan a program will undoubtedly tend to fail. Likewise, educational success is closely associated with quality learning processes. This research is a case study analysis that explores a system that is bound or a case (or it could be several cases) that occurred over a certain period through in-depth and detailed data collection from various sources of information that can be trusted for the truth of the testimony. This research aims to determine the effect of project-based learning on students' creativity in preparing learning designs. This study used an experimental type using a one-group pretest-posttest technique. The research was conducted at Vocational High School in Surabaya, involving ten multimedia teachers and collecting data using practice tests. The results and analysis of the data obtained in the independent sample t-test get t count > t table. If so, project-based learning affects teacher creativity.

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Introduction

Learning in the 21st century is expected to open up wider employment opportunities and expand employment opportunities for Indonesian people as quality and superior human resources. To form quality human resources, educators ready to teach and educate through 21st-century learning must be relevant to the development of the 4.0 Industrial Revolution Era. The Ministry of Education and Culture (Kemdikbud) of the Republic of Indonesia formulated that the 21st-century learning paradigm emphasizes the ability of students to find out from various sources, acquire problems, think analytically, and work together and collaborate in solving problems.

To achieve this goal, the Ministry of Education and Culture has adopted three 21st-century education concepts to develop curricula for Elementary Schools (SD), Junior High Schools (SMP), Senior High Schools (SMA), and Vocational High Schools (SMK). These concepts are 21st-century skills, scientific approach, authentic learning, and assessment, adapted to develop education toward Creative Indonesia in 2045.

This is supported by the results of research showing that there is a shift in work in the future which shows that the highest type of work is creative work which requires intelligence and human creativity to produce creative and innovative products. In contrast, routine work will be taken over by robots and other automation processes (Karim & Daryanto, 2017, p. 12).

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Global demands require the world of education to continuously adapt technological developments to efforts to improve the quality of education, not only human resources but also the devices in it. One of them is the learning model. This writing utilizes innovations developed previously, namely using the Project-Based Learning model. Project-Based learning can make teaching and learning more student-centered, innovative, and independent.

The success of a program is closely related to the quality of the planning made. The inability of someone to plan a program will undoubtedly tend to fail. Likewise, educational success is closely associated with quality learning processes. This research is a case study analysis that explores a system that is bound or a case (or it could be several cases) that occurred during a specific period through the collection of in-depth and detailed data from various sources of information that can be trusted for the truth of the testimony (Creswell, 1988).

According to Creswell, gathering information in the case of studies can be done by conducting interviews with informants, direct field observations, and various pre-existing documents and reports. Based on observations and interviews with researchers, many teachers in Indonesia, especially the Multimedia teachers at Vocational High School in Surabaya, need help preparing lesson plans. Although the Minister of Education Nadiem Makarim. Through circular letter number 14 of 2019, the learning implementation plan has been simplified. However, it still has to be combined with the needs and conditions of the subject/character of students in the class. Meanwhile, most SMKs in Surabaya are still implementing the 2013 Curriculum this year. This is what raises several problems experienced by teachers:

1. It is difficult to determine and combine learning objectives
2. Confusion in formulating learning indicators
3. Busy teaching and activities outside of school, so lazy to make RPP (Learning Implementation Plan). Teachers are required to prepare lesson plans thoroughly and systematically (Appendix to the Minister of Education and Culture Number 22 of 2016 concerning Process Standards)
4. Lack of creative ability for each teacher to formulate lesson plans

Research Method

This study used an experimental research method in the form of a one-group pretest-posttest design and data collection techniques using practice tests. Participants in this study were ten people. In this study, there are two variables, namely, project-based learning and creative thinking. According to Stolaki (Cahyani et al., 2020), creativity indicators are fluency, flexibility, elaboration, and originality.

Table 1. The research instrument grid

Indicators	Sub-Indicators
Fluency	1. Submit ideas/ideas to create a design 2. Develop a design plan
Flexibility	3. Create a design based on design principles
Elaboration	4. Make a description of the design made

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Originality	5. Create unique combinations of objects and colors 6. Generate a logo as an identity

Before testing the hypothesis, the data needs to be tested for prerequisites, namely normality, using the product-moment correlation test and homogeneity test to show that the data is usually distributed and homogeneous. After that, an independent sample t-test is performed using the SPSS version of the application 25.0 Windows to determine the effect on pre and post-test in one group.

Result

Researchers have conducted a needs analysis for the effect of project based learning on creative thinking for teachers through observation and distributing questionnaires (google forms) which are disseminated through the WhatsApp application. Based on observations made during the culinary learning process, the following data are obtained:

Table 2. Observation results of needs analysis

	Observation Results
1.	The lecture learning method is often used in learning
2.	Inadequate facilities for teaching and learning activities
3.	There are still students who do not actively participate in the learning process
4.	Teachers have difficulty in preparing a standardized Learning Implementation Plan (RPP).

Researchers gave questionnaires on September 24 - October 2 2022 to Multimedia teachers, namely 10 teachers: SMK Unitomo Surabaya 2 people; SMK Wijaya Putra Surabaya 2 people; SMK Gama Cendekia Surabaya 2 people; SMK Ketintang Surabaya 1 person; SMK Wachid Hasyim 2 Surabaya 1 person; SMK Mahardika Surabaya 1 person; SMKN 10 Surabaya 1 person. The statements/questions given are as many as 5 questions. Below is presented the data and the results of the analysis:

1. The first statement reads, "At school you always apply a learning model that is appropriate to the subject matter"

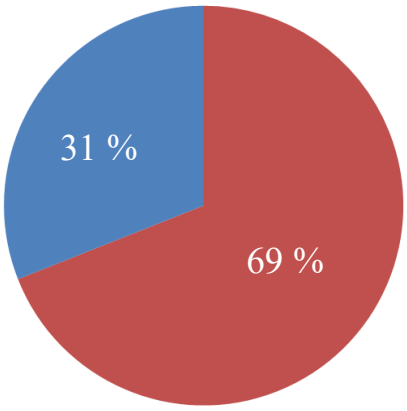

Figure 1. Results of the First Statement Questionnaire

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From Figure 1 it can be seen that the learning model must be developed according to the topic material and student characteristics, this is based on the response of 69% of teachers who stated that the learning model that is suitable for the subject is not always applied, this shows that the existing learning model is not suitable for the subject.

2. The second statement reads, "In your school there are always adequate facilities available and support teaching and learning activities (KBM)"

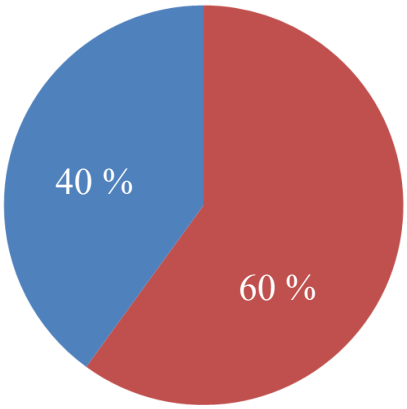

Figure 2. Results of the Second Statement Questionnaire

60% of teachers disagree with the statement that adequate facilities are always available and support teaching and learning activities (KBM), while 40% of teachers agree. From Figure 2 it can be seen that learning facilities must be developed according to the subject matter and student characteristics.

3. The third question reads, "Does the teacher always make a standardized lesson plan (RPP) according to the characteristics of the material?

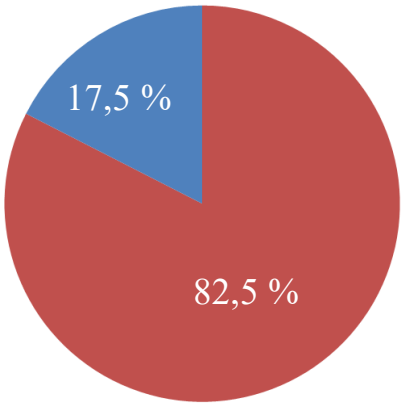

Figure 3. Results of the Third Question Questionnaire

Figure 3 shows that 82.5% of teachers disagree if the teacher always makes a standardized lesson plan (RPP) according to the characteristics of the material and another 17.5% of teachers agree with this statement. From Figure 3 above, it can be seen that training is needed on making a standardized Learning Implementation Plan (RPP) according to the characteristics of the material.

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4. The fourth question reads, "Is designing a Learning Implementation Plan (RPP) in compiling indicators, learning objectives, and so on the result of your own thoughts?"

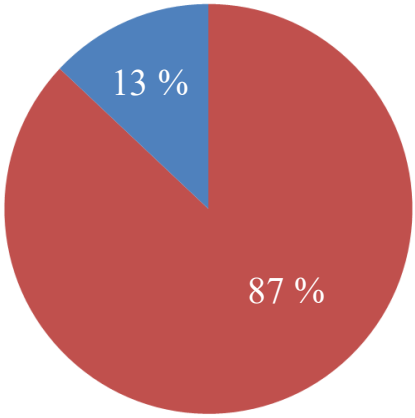

Figure 4. Results of the Fourth Question Questionnaire

Figure 4 shows that 87% of teachers do not develop indicators, their own learning objectives and 13% of teachers develop indicators, their own learning objectives.

5. The fifth statement reads, "Students are more active and focused on the material if the teacher prepares a standardized Learning Implementation Plan (RPP) according to the characteristics of the material."

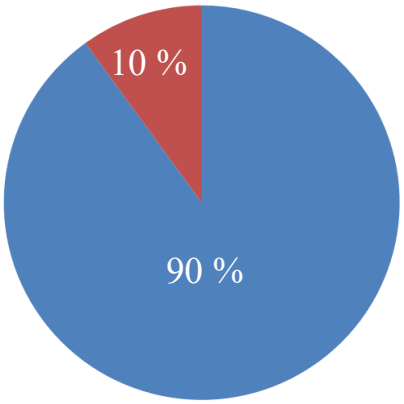

Figure 5. Results of the Fifth Question Questionnaire

From Figure 5 it can be seen that 90% of teachers agree and state that students become more active and focused on the material if the teacher prepares a standardized Learning Implementation Plan (RPP) according to the characteristics of the material.

Discussion

Through the results of observation and questionnaire data, the results of the needs analysis were obtained, namely, the researcher offered a solution in the form of project based learning training to develop learning designs for multimedia teachers at SMK level in Surabaya.

Project-based learning or project-based learning is a learning model that uses projects or activities as learning tools to achieve attitude, knowledge, and skill competencies. The

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project itself can be interpreted as an activity that involves much work and requires coordination and specialization of support personnel to complete it.

From the research questionnaire data it was also seen that 90% of teachers agreed and stated that students became more active and focused on the subject matter if the teacher prepared a standardized Learning Implementation Plan (RPP) according to the characteristics of the material. This is also reinforced by the findings of previous research, Sucipta, Candiasa & Sukajaya, (2018: 7) using the Project Based Learning model provides opportunities for students to explore events that are detrimental in nature so that they can be linked to the material, then complete or provide solutions that are relevant.

Saefudin (2014: 58) argues that project-based learning is a method that uses problems to gather and integrate new knowledge based on experience in actual activities. The implication is that the project is only a vehicle that will stimulate students to be creative and learn.

Based on the theoretical findings that support it, including looking at the previous explanation regarding creativity, the Project Based Learning model is applied to develop and foster students' creative thinking. Based on Munandar's opinion (2012: 227), there are three indicators used, namely fluency indicators (fluent), conducting discussions and assessing students' responses or answers, assessing students' abilities in analyzing problems, and answering these questions. Munandar (2012: 227) says creative individuals have a great interest in learning anything that is challenging, different, and unique and has a high interest in learning so that they are active in discussions by answering questions or giving questions during the learning process.

The indicator of flexibility, the experimental class looks very enthusiastic when participating in learning activities in the classroom. One driving factor is the teacher's use of a project-based learning model. When students are encouraged to think critically and be involved in completing projects given by the teacher, the stages that students must work on in completing the project are analyzing and understanding existing problems and providing solutions which are stages in developing creativity (Widiyaningrum & Harnik, 2016: 29).

Novelty indicator (Original) can be assessed from the solutions given to solve the problem. In line with the opinion of Utami, Probosari & Fatmawati (2015: 6), indicators of novelty (Original) can be measured when the solutions or answers given by students differ from the others. The problems studied and the solutions given in the experimental class varied and followed the conditions in the field. Differences were found in several groups in the experimental class in discussing and solving problems. Students are confident and confident in the results obtained in groups even though they differ from other groups.

Conclusion

Based on the needs analysis results, the project-based learning model is needed in the learning process to increase creative thinking to fulfill learning objectives and improve learning outcomes. The Project Based Learning learning model must be adapted to the subject matter and the characteristics of students so that the project-based learning model's influence is aimed at increasing teacher knowledge and improving their skills. The results of this study provide benefits as a complement to previous research studies and add to the body of knowledge, especially in the field of educational technology, as well as being a reference material for further research related to the effect of Project Based Learning on the ability to think creatively for teachers.

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Recommendation

Based on the findings, some recommendations for further research have been set up. Suggestions in this development research include: First, it is easier teachers to prepare standard/quality learning designs. Second, raise the spirit of learning teachers. Third, improve the creative ability—of multimedia teachers at. Fourth, improve student achievement in multimedia subjects.

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