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Analysis of Understanding the Role of Teachers in Exploring Students' Creative Thinking in College Students Through Project Based Learning (Pjbl)

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Abstract: *Teachers have an important role in assessing students' learning progress and providing constructive feedback. This helps students understand where they stand in the learning process and provides a clear direction for improvement. The urgency of the teacher's role in fluent learning is fundamental because Teacher Engagement Influences Student Motivation When teachers are actively involved in the learning process, students tend to be more motivated to learn. The presence and active role of the teacher helps to create a motivating and supportive environment. Teachers as a Source of Knowledge and Authority are the main source of knowledge in the classroom. They not only convey information, but also guide students to understand and apply the concepts. Without an effective teacher role, students may struggle to understand the material well. This research is a type of qualitative research with descriptive analysis. The choice of research type is adjusted to the purpose of the problem focused on in this study. This research involved 3 classes in 3 different subjects. The subjects studied involved 3 classes of students with a total of 56 people with heterogeneous characteristics. Data collection methods with observation and interviews using validated instruments. The conclusion of the research is that students can complete learning well with project-based leaning (PjBL), the results of learning can be used to play a role in exploring students' creative thinking.*

Keywords: Teacher's Role, Creative Thinking, Project Based Learning (PjBL)

1. INTRODUCTION

Good communication to teach complex concepts in a simple and interesting way for students. Teachers need to motivate students to learn by providing positive encouragement and building good relationships with each student [1][2][3]. They should also be able to identify students' individual needs and provide appropriate guidance to help them reach their full potential. In addition, in assessment and feedback, teachers have an important role in assessing students' learning progress and providing constructive feedback [4][5]. This helps students understand where they stand in the learning process and provides a clear direction for improvement.

fostering a Safe and Inclusive Learning Environment. Teachers are responsible for creating a supportive, inclusive and safe learning environment for all students. They must ensure that every student feels accepted and valued, thus enabling them to learn without fear or distraction. The urgency of the teacher's role in seamless learning is fundamental because Teacher Engagement Influences Student Motivation When teachers are actively involved in the learning process, students tend to be more motivated to learn [6][7]. The presence and active role of the teacher helps to create a motivating and supportive environment. Teachers as a Source of Knowledge and Authorities are the primary source of knowledge in the classroom. They not only convey information, but also guide students to understand and apply the concepts. Without an effective teacher role, students may struggle to understand the material well. Structured Learning Minimizes Chaos in learning [8][9][10]. With the teacher's role in planning and organizing learning, classroom chaos can be minimized. This helps create an environment conducive to learning, where students can focus on the subject matter without distraction. Effective Assessment and Feedback Drives Improvement. Teachers who provide quality assessment and feedback help students to identify areas where they need to improve and provide a clear direction for improvement. This is important for students' overall growth and development. Thus, the role of teachers in classroom learning is not only important, but also urgent to ensure a smooth and effective learning process.

The exploration of creative thinking in students is an important aspect of higher education that helps them develop the ability to think innovatively, critically, and creatively [11] [12]. By paying attention to supporting factors such as asking open-ended questions, providing opportunities for collaboration, setting up a supportive learning environment then by giving proper attention to the development of creative

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thinking, students can gain invaluable skills that will help them develop their creative thinking skills.

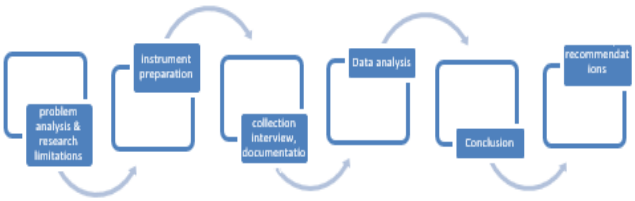
2. STATEMENT OF THE PROBLEM

The formulation of the problem taken in this study is to describe the steps taken to understand the role of the teacher in exploring students' creative thinking in students by learning through Project Based Learning (Pjbl). How is the implementation of project-based learning (PjBL).

3. RESEARCH METHODOLOGY

3.1 RESEARCH DESIGN

This research is a type of qualitative research with descriptive analysis. The selection of the type of research is adjusted to the objectives of the problem focused on in this study. According to John W. Creswell, a well-known research methodologist, qualitative research is an approach to research that focuses on an in-depth understanding of social, cultural, or behavioral phenomena [13]. The findings serve as a foundation for recommendations about further research . Figure 1 below depicts the progression of the study that was done.



Based on Figure 1, the data analysis technique classified is a descriptive technique. Data obtained from coding to facilitate analysis. The data obtained from the analysis results are described in accordance with the problem formulation. Descriptive results are represented to make it easier to display and retrieve research results.

3.2 PARTICIPANTS OF THE

This study involved 3 classes in 3 different subjects. The subjects involved 3 classes of students with a total of 56 people with heterogeneous characteristics. This type of random but deliberate sampling drawn from classes with certain characteristics is referred to as "stratified random sampling." In this method, the population is broken down into groups (strata) that have similar characteristics [15][16]. Then, random samples are drawn from each stratum to ensure better representation of each characteristic in the population.

3.3 RESEARCH INSTRUMENTS

This research uses several types of data collection methods involving research instruments. The observation data collection method is carried out using the help of an observation sheet that has been validated by experts first. The method of collecting interview data using an interview guideline instrument on the selected subjects with reference to the results of the observation data. The subjects interviewed were selected using several predetermined criteria. The criteria for the subjects interviewed were subjects with the best project work scores, subjects with high creative thinking skills, and subjects with the best understanding of roles. In qualitative research using data validity testing using source triangulation [13]. So that the subjects chosen are more than one. In this study, 3 subjects were interviewed with the predetermined criteria described above.

4. RESULTS AND DISCUSSION

The research produced observation data from a total of 56 students in 3 classes. The observation results include observations of student creative thinking which consists of 4 indicators including fluency, flexibility, elaboration, and originality [12]. The following is a table of data on the results of observations of students' creative thinking abilities.

Table 1. Observation Results Of Students' Creative Thinking

class	Number of Students	Fluency		Flexibility		Elaboration		Originality	
		yes	no	yes	no	yes	no	yes	no
A	26	3	23	3	23	15	11	2	24
B	18	2	16	1	17	6	12	1	17
C	12	1	11	1	10	4	8	0	12

Based on the data in Table 1, subjects will be taken with the provisions that have been determined. Then the subjects of class A were obtained in the amount of 2 people and class B in the amount of 1 person. The subjects who meet the 4 criteria of creative thinking. The subjects are A1, A2, and B1. The next research activity is to observe the results of the project performance that has been completed by the subject. The subject presented how the subject became a teacher and taught the results of his project to be understood by his students in class. This personal simulation of teacher branding is carried out to see the subject's skills in understanding the material as a teacher with project-based learning (PjBL). The results of the observation of understanding ability are presented in the following figure.

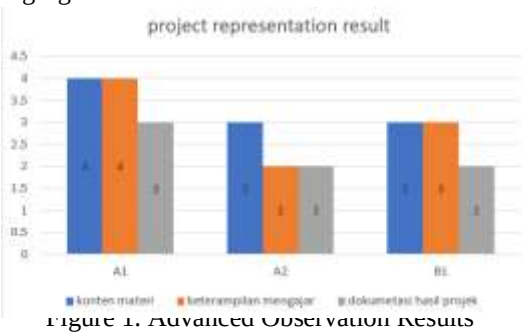


Figure 1. Advanced Observation Results

Looking at the data from Figure 1, it can be seen the acquisition of the subject's ability as a teacher's role in understanding the material. The range of scores from 1 to 4 is the highest. Subject A1 collected the highest score with a total of 11 points, A2 amounted to 7 points, and A3 amounted to 8 points. So it can be said that A1 obtained the highest score.

Learning activities with problem-based learning (PjBL) can be carried out well with the fulfillment and completion of the project given [17]. The next research step is the interview method which is carried out to obtain data on the exploration of project activities that have been carried out by the subject. This data collection uses a validated interview guideline sheet. The following is given a summary of the results of the sub-interviews on each subject.

Table 2. Summary Results of Sub-interviews

Sub wawancara	A1	A2	B1
projek	etnomatematika dalam pembelajaran	aritmatika sosial dalam pembelajaran	digital literasi dalam pembelajaran
proses penyelesaian projek	melalui informasi digital, observasi obyek langsung, analisis konsep materi matematika yang terhubung	studi literatur, survey ke toko/mall	studi lliteratur pada platform pembelajaran, survey pada siswa
hambatan	tidak ada	ijin survey yang sulit	tidak ada

Based on table 2 above, it can be seen that the 3 subjects with different projects each have different ways and solutions. Analysis of subject A1 shows that the completion process involves a variety of information obtained from digital, directly on related objects as learning with direct sources, and linking data results in the field with existing theories. what has been done by subject A1 is a good thing in order to improve creative thinking skills. Because from various sources and food views, new things can be found that are the latest findings [18]. Creative activities carried out by being able to design activities that are a series of direct research by making notes of findings that are formalized and delivered during learning with students in class [19][20]. This can make it easier for students to understand because it involves things that are close to students' daily lives. The strategy of delivering project results is also well represented and easy for students to understand.

Subject A2 with a project related to social arithmetic is very close to the students' lifestyle. So the selection of surveys is a good method in obtaining data from the field. In addition, before conducting the survey, the subject has equipped his knowledge in advance by reading sources from several literatures [21]. This is very good in order to provide initial provisions in making surveys and taking surveys conducted. However, the obstacles experienced are related to the store/mall that will be used as a source of data collection, which also needs to be considered further. It is necessary to choose the right place so that the data obtained is appropriate.

Subject B1 who examines the digital literacy project in learning should indeed have skills related to the development of good information technology. This skill must be supported in order to be able to surf in cyberspace to get data about digital literacy that is widely used today [22]. The results of the project show that digital literacy is closely related to the use of artificial intelligence (AI) [23][14]. This is an important added point in the project results on subject B1. After learning how digital literacy in learning, it is appropriate to survey the initial results to obtain data on the use of digital literacy in learning by students. This learning is anywhere and anytime. So it requires the right data to continue the project results. The survey must be conducted using an adequate survey instrument that can cover all the data needed. So naturally the implementation of this project did not find any significant obstacles. Based on the research data above, the results of observations and interviews show that subject A1 has the highest points and is supported by adequate interview results. Likewise with subject A2 with not too low point results but the completion of the interview results despite having obstacles but the project was completed in a good way. Subject B1 of course with a fairly high point 8 has also been able to properly complete the project task in a good way of representation as well. The completion strategy is good and very appropriate. Subjects as teachers in their role of providing understanding in the exploration of students' creative thinking can be shown by well-completed projects in subjects A1. A2, and B1.

5. CONCLUSION

The conclusions that can be drawn from the research that has been described are as follows.

a. Subjects as students can complete well learning with project-based leaning (PjBL)

b. The results of learning can be used to play a role in the exploration of students' creative thinking.

Some recommendations that researchers can convey based on the findings during the research activities are related to the implementation of learning can be used different methods so that the role of the teacher in understanding and exploring the ability of creative thinking can increase and more students have the ability to think creatively.

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