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The Influence of Inquiry Collaboration Pbl Learning Model on Students' Critical Thinking Ability

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Abstract: The ability to think critically is one of the skills that is very important and needed in the 21st century. The aim of this research is to determine the influence of the collaborative inquiry PBL model on the critical thinking ability of Indonesian Language and Literature Education Study Program students. This research is a quasi-experimental type of quantitative research and the design used is post-test only control. The population of this research is all 3rd semester students taking the Language Research Methodology course. The sample in this research is class IIIA as an experimental class using the Problem Based Learning collaborative inquiry learning model and class IIIB as a control class using a conventional learning model. Class random sampling technique. The data collection used was a critical thinking ability test and a self-efficacy questionnaire. The analytical test used is two-way analysis of variance with unequal cells, with a significance level of 5%.

Keywords: Learning Models, PBL Collaborative Inquiry, Critical Thinking, Language Research Methodology

1. Introduction

The development of the Inquiry collaborative PBL learning model in educational research methodology courses has been developed based on the needs of lecturers and students in the Indonesian Language and Literature Education Study Program. The process of designing an Inquiry collaborative PBL learning model is carried out by combining syntax *PBL* and *Inquiry*. The stage of designing the Inquiry collaborative PBL learning model was carried out by combining the PBL learning model with *Inquiry*, (Ahsin, et. al 2020; Angelia, et. al 2020; Arukah, et. al 2020). The aim is for students to get double benefits from both learning models. Learning *PBL* rich in nuances of cooperation and trains students to have the ability to solve problems, discussions and presentations, meanwhile *Inquiry* requires and trains students to have the skills to find solutions to problems scientifically. Each model has characteristics and advantages, so that if they collaborate, students can get maximum benefits.

Learning syntax *PBL* There are five, namely orienting students to problems, organizing students to learn, guiding individual and group investigations, developing and presenting work results, and analyzing and evaluating the problem solving process, (Fathurohman, et. al 2020; Kara, et. al 2020; Satria, et. al 2020; Septaningsih, et. al 2020). Learning syntax *Inquiry* consists of six stages, namely problem orientation, formulating problems, making hypotheses, exploration (gathering information or data), testing hypotheses and making conclusions, (Arukah, et. al 2020; Dewanti, et. al 2020; Endiawan, et. al 2020). This mix basically combines activities *PBL* into the syntax *Inquiry*.

The draft collaborative Inquiry PBL learning model that has been developed is then validated by learning model experts and education experts to obtain input, (Fathurohman, 2020; Kara, et. al 2020; Purnaningtyas, et. al 2020; Purnaningtyas, et. al 2020). The input from these experts was used to revise the draft Inquiry collaborative PBL learning model, (Fathurohman, et. al 2020; Sofia, et. al 2020; Tamarudin, et. al 2020). Next, an FGD was carried out to find out the advantages and disadvantages as well as input from lecturers and policy makers. Input from lecturers in FGD activities is used to perfect the Inquiry collaborative PBL learning model before it is used in the field to determine the level of effectiveness of the model.

To determine the level of effectiveness of the collaborative PBL learning model, this inquiry was carried out

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experimentally. The experiment was carried out in 2 classes, namely class A for the experimental group and class B students as the control class. This experiment was carried out from February 2024 to May 2024. This experiment was carried out involving 1 class A lecturer and the control class also involved 1 class B lecturer. The lecturers experimented with learning student educational research methodology using the Inquiry collaborative PBL learning model based on the draft Implementation Guide book Inquiry collaborative PBL learning for students in the Indonesian Language and Literature Education Study Program, FKIP UMK. Before carrying out the experiment, both the experimental group and the control group were given the same educational research methodology ability test (*pretest*), as well as afterwards (*posttest*). The pretest and posttest results were then tested for normality and homogeneity.

The normality test in this research consists of class A as well as class B. In the calculations, the Asymp Sig value is greater than the confidence level $\alpha = 0.05$. This means that the sample group comes from a normally distributed population.

2. Structure of References

The implementation of the Inquiry collaborative PBL learning model is a combination of PBL learning and Inquiry, so that several previous studies were related to learning outcomes *PBL* and *Inquiry* can be used as a reference. Previous research results show learning outcomes with *PBL* more effective than traditional in improving academic achievement (Sahin, 2010; Evcim & Ipek, 2013; Wilson et.al., 2017; Hoerunnisa et.al., 2017; Subiyantari et.al., 2019). A study on the effectiveness of learning outcomes also concluded that cooperative learning had the most positive impact on achievement variables (Darmuki, et al., 2017). The results of research using the Inquiry collaborative PBL model are also supported by the results of learning research *Inquiry* which shows that there are significant differences between the experimental group and the control group regarding average academic achievement, learning retention scores, and student perceptions of skills in carrying out investigations, both at the cognitive and affective levels (Dedonno, 2016; Indiastutik, 2016; Martaida et al. .al., 2017; Putri et.al., 2020; Gunawan et.al., 2020; This result is also confirmed by other research studies, namely that the inquiry learning method is better than traditional teaching methods in terms of academic achievement (Nuryakin & Riandi, 2017). Other research results show that students achieve better in understanding the content of learning through *Inquiry* compared to the lecture method (Rahmadani et.al., 2017; Rambe et.al. 2018).

3. Methodology

This research was conducted to determine the effect of implementing the Inquiry collaborative PBL learning model on student learning outcomes. The PBL learning model was carried out in the experimental group in class IID with a total of 38 students, while the control group in class IIA with a total of 36 students used the lecture method. Class IID as the experimental group and class IIA as the control group were carried out separately *cluster sampling* Previously, a balance test had been carried out on the entire population of level II of the Indonesian Language and Literature Education Study Program, Muria Kudus University and Muhammadiyah University of Malang for the 2023/2024 Academic Year. Learning outcomes ability test *(posttest)* The two groups treated with different methods were compared, so that it could be seen whether there was an influence of the application of the PBL learning model on students' learning outcomes.

The development of the Inquiry collaborative PBL learning model in educational research methodology courses has been developed based on the needs of lecturers and students in the Indonesian Language and Literature Education Study Program. The process of designing an Inquiry collaborative PBL learning model is carried out by combining syntax *PBL* and *Inquiry*. The stage of designing the Inquiry collaborative PBL learning model was carried out by combining the PBL learning model with *Inquiry*. The aim is for students to get double benefits from both learning models. Learning *PBL* rich in nuances of cooperation and trains students to have the ability to solve problems, discussions and presentations, meanwhile *Inquiry* requires and trains students to have the skills to find solutions to problems scientifically. Each model has characteristics and advantages, so that if they collaborate, students can get maximum benefits.

Data from educational research methodology ability tests were analyzed using *uji t*previously tested for normality and homogeneity. Statistically, both educational research methodologies ability scores are different because $F_{calculation}$ was 16.5875 while F_{table} was 3.91 at the significance level =0.05. Since $F_{calculation} > F_{table}$, it can show that Inquiry Collaborative PBL learning has a very significant influence on educational research methodology for Indonesian Language and Literature Education Study Program students, FKIP UMK.).

4. Results and Discussion

The aim of this research was to determine the effect of implementing the Inquiry collaborative PBL learning model on student learning outcomes. The PBL learning model was carried out in the experimental group in class IID with a total of 38 students, while the control group in class IIA with a total of 36 students used the lecture method. Class IID as the experimental group and class IIA as the control group were carried out separately *cluster sampling* Previously, a balance test had been carried out on the entire population of level II of the Indonesian Language and Literature Education Study Program, Muria Kudus University and Muhammadiyah University of Malang for the 2023/2024 Academic Year. Learning outcomes ability test *(posttest)* The two groups treated with different methods were compared, so that it could be seen whether there was an influence of the application of the PBL learning model on students' learning outcomes.

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The draft collaborative Inquiry PBL learning model that has been developed is then validated by learning model experts and education experts to obtain input. The input from these experts was used to revise the draft Inquiry collaborative PBL learning model. Next, an FGD was carried out to find out the advantages and disadvantages as well as input from lecturers and policy makers. Input from lecturers in FGD activities is used to perfect the Inquiry collaborative PBL learning model before it is used in the field to determine the level of effectiveness of the model.

To determine the level of effectiveness of the collaborative PBL learning model, this inquiry was carried out experimentally. The experiment was carried out in 2 classes, namely class A for the experimental group and class B students as the control class. This experiment was carried out from February 2024 to May 2024. This experiment was carried out involving 1 class A lecturer and the control class also involved 1 class B lecturer. The lecturers experimented with learning student educational research methodology using the Inquiry collaborative PBL learning model based on the draft Implementation Guide book Inquiry collaborative PBL learning for students in the Indonesian Language and Literature Education Study Program, FKIP UMK. Before carrying out the experiment, both the experimental group and the control group were given the same educational research methodology ability test (*pretest*), as well as afterwards (*posttest*). The pretest and posttest results were then tested for normality and homogeneity.

Based on the results of the lecturer's perception questionnaire, it shows that in general the Inquiry collaborative PBL learning model regarding the importance of learning educational research methodology during the pretest was lower, 55% for the experimental group, 75% for the control group, while at the posttest the experimental group and the control group were the same at 100%.

Data from educational research methodology ability tests were analyzed using *uji t*previously tested for normality and homogeneity. Statistically, both educational research methodologies ability scores are different because $F_{calculation}$ was 16.5875 while F_{table} was 3.91 at the significance level =0.05. Since $F_{calculation} > F_{table}$, it can show that Inquiry collaborative PBL learning has a very significant influence on the educational research methodology of Indonesian Language and Literature Education Study Program students, FKIP UMK.

Based on the results of this research, lecturers need to adapt student learning needs to learning strategies. *Multiple models of instruction* is the practice of applying several different learning models in the teaching process. The choice of learning model to be used by a lecturer is determined by the characteristics of the learning material and learning objectives to be conveyed, the ability to meet student learning needs, and the ability to increase student learning capacity to optimal limits (Arifmiboy, 2018). In line with the views of Arend (2018: 111), it is impossible for there to be one teaching model that is considered superior for all educational purposes. In reality, each teaching model is often only suitable for certain types of learning, however these models can also be combined to help students achieve learning goals (Suryanti et. al., 2020: 76). No single approach is consistently better than another.

The implementation of the Inquiry collaborative PBL learning model is a combination of PBL learning and Inquiry, so that several previous studies were related to learning outcomes *PBL* and *Inquiry* can be used as a reference. Previous research results show learning outcomes with *PBL* more effective than traditional in improving academic achievement (Sahin, 2010; Evcim & Ipek, 2013; Wilson et.al., 2017; Hoerunnisa et.al., 2017; Subiyantari et.al., 2019). A study on the effectiveness of learning outcomes also concluded that cooperative learning had the most positive impact on achievement variables (Darmuki, et al., 2017).

The results of research using the Inquiry collaborative PBL model are also supported by the results of learning research *Inquiry* which shows that there are significant differences between the experimental group and the control group regarding average academic achievement, learning retention scores, and student perceptions of skills in carrying out investigations, both at the cognitive and affective levels (Dedonno, 2016; Indiastutik, 2016; Martaida et al. .al., 2017; Putri et.al., 2020; Gunawan et.al., 2020; This result is also confirmed by other research studies, namely that the inquiry learning method is better than traditional teaching methods in terms of academic achievement (Nuryakin & Riandi, 2017). Other research results show that students achieve better in understanding the content of learning through *Inquiry* compared to the lecture method (Rahmadani et.al., 2017; Rambe et.al. 2018).

This Inquiry collaborative PBL learning model has the potential to increase students' social interaction in learning educational research methodology. Social interaction is important considering the different characteristics of students in class (Darmuki & Hariyadi, 2019). The practice of using the Inquiry collaborative PBL model is to carry out scientific work in cooperative groups, so that this model is able to close the gap between upper and lower academic students, tensions caused by differences in student backgrounds, and is able to reduce the negative impact of competitive learning which gives birth to unhealthy competition (Sahin , 2010; Gunawan et.al., 2020). Student interaction in the PBL group is related to inquiry activities to discover concepts or facts through stages of scientific work, while in the PBL group social interaction is encouraged in problem solving activities through intense presentations and discussions to build a complete conceptual understanding of educational research methodology.

A literature review of studies on learning in the classroom reveals that the application of learning models using the Inquiry collaborative PBL method is more effective (Leyva & Riu, 2016; Yemi et. al., 2018; Subiyantari et. al., 2019(Jigsaw); Rambe et. al. , 2018; Wardono et.al., 2020; Winarni et.al., 2020; Gunawan & Lestari, 2020 (Discovery Learning)). The research results of (Leung et.al. 2018) have collaborated with the discovery learning model with the Geogebra model assistant to show that learning activities are effective and enjoyable. Research by (Suryanti et.al. 2020) shows that the discovery learning model which is collaborated with the problem solving learning model shows an increase in students' abilities and understanding in mastering material concepts well and optimally. Previous scientific studies conducted by (Darmuki & Hariyadi 2019) in classroom learning using the PBL learning model can maximize student learning outcomes. Learning strategies which include learning models applied by lecturers in teaching and learning activities will influence the success of learning objectives. The lecturer's ability to apply learning models will make it easier for students to receive learning (Darmuki et al., 2018).

The weakness of this research is that the learning process in the classroom lies in the lecturer's commitment when implementing the collaborative Inquiry PBL learning model where the combination of the PBL learning model is more dominant than the Inquiry learning model. Apart from that, another weakness during the learning process is that students lack a competitive atmosphere so that there are some students who dominate learning in class even though in the end all students are actively learning. The strength of this research lies in social interaction in learning and students' needs in learning so that it can build a complete understanding of students' concepts regarding educational research methodology through problem solving. The application of the Inquiry collaborative PBL learning model in this research is proven by the Inquiry collaboration PBL learning model applied by lecturers in learning educational research methodology. It turns out that students find it easier to understand educational research methodology courses so that student competence is better.

The results of this research indicate that the application of the Inquiry collaborative PBL learning model in educational research methodology learning is able to improve students' critical thinking abilities. This research is in line with research conducted by (Palupi et al. 2020; Saputra et al. 2019; Azizah et al. 2018) who stated that there was an increase in students' and university students' critical thinking abilities through collaborative constructivist learning. Other research that supports this research is research conducted by (Utami & Giarti, 2020) which states that through collaborative learning and critical thinking, learning outcomes including thinking abilities can be improved. This research is also strengthened by research conducted by (Prayoga & Setyaningtyas, 2021) regarding the use of the collaborative Inquiry PBL model to improve critical thinking skills and learning outcomes. It is proven by the data obtained that there has been a significant increase in each cycle.

5. Conclusion

The results of this research are very important for learning the Educational Research Methodology course. The Inquiry collaborative PBL model has a positive influence on students' critical thinking abilities and the effectiveness of learning in the classroom. It can be concluded that the Inquiry collaborative PBL model is more effective than the lecture model because it is able to improve students' critical thinking skills in educational research methodology courses in the Indonesian Language and Literature Education Study Program. This research provides an overview for students, lecturers and academics about improving the quality of the learning process and learning outcomes when the collaborative Inquiry PBL model is applied in the classroom. This cannot be separated from the role of lecturers, students, appropriate learning models or methods in producing good learning outcomes, and other factors. Further research is needed to test the practicality and effectiveness of PBL and other learning models to determine critical thinking abilities and student learning outcomes in educational research methodology courses. The implication of this research is that the collaborative inquiry PBL model can be applied in other learning that can develop students' critical thinking abilities. It can be applied in other learning that can develop students' critical thinking abilities.

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Conflict of Interest

The authors declare no conflicts of interest.

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