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Improving Mastery of Educational Research Course Through the Application of a Reflective Learning Model for Undergraduate Students of Primary Teacher Education

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Abstract

Abstract: The purpose of this study was to determine the description of the application of reflective methods in learning in Educational Research courses as well as to determine the goodness of reflective methods on student learning outcomes. The subject of Educational Research was chosen because there is a growing assumption among students that this subject is difficult to understand as well as few of them who get excellent grades (A). Through a quasi-experimental study, one group pretest-posttest design on fifth semester students of class B regular morning PGSD FKIP Unram, with 50 samples from 50 students by purposive random sampling. The application of reflective methods to class V / B morning through, the stages of identifying problems, formulating problems and solutions, and solving problems in learning Educational Research. The average results of the pretest and posttest to 50 sample students were obtained through the implementation of the pretest and posttest and then compared. The results showed that the posttest learning outcomes (75.41) were better than the pretest learning outcomes (59.05). The results of the normalized gain $\langle g \rangle$ test found $\langle g \rangle = 0.352$ (medium classification). The reflective method is indicated to be able to improve students' Educational Research learning outcomes, indicated by the difference in posttest and pretest learning outcomes of 16.36 and significant in the medium category.

Keywords: *Reflective Method; Educational Research Learning*

Introduction

Educational Research is a course that aims to help students analyze data. This kind of ability is needed later after they become teachers. As is known, every teacher to be promoted must have scientific work and the like, in accordance with the Regulation of the Minister of Administrative Reform and Bureaucratic Reform (Permen PANRB) No.16 of 2009 dated November 10, 2009 concerning the Functional Position of Teachers and their Credit Score. The elements and sub-elements of teacher activities that are assessed for credit include scientific publications of research results or innovative ideas in the field of formal education.

If only it is realized that it is so necessary to have basic Educational Research knowledge, then it is likely that every student will strive for it, but in reality, most students, once they hear the word

Educational Research, what they imagine first is formulas, problem solving and so on. This condition certainly does not support a good and conducive learning process. Therefore, lecturers teaching the course are required to make various learning innovations, so that students' curiosity arises, so that they are interested and eager to learn Educational Research.

One manifestation of the lecturer's efforts to arouse students' interest in learning Educational Research is the application of reflective methods. Through the reflective method, students will be accustomed to not only understanding the formulas in data analysis, but accompanied by continuous exercises. Thus, it has an impact on improving students' ability to analyze data. Thus, the quality of the process and learning outcomes of Educational Research will increase.

Given the urgency, students must be able to analyze data properly and correctly by doing a series of varied exercises. The government through the Ministry of Education underlines the importance of improving students' abilities and skills. Students are people who are trusted as prospective educators to educate, teach, train, and evaluate the learning process and results of their students. In carrying out their duties, students as prospective teachers are not in an empty environment. Students as prospective teachers are part of the preparation of a "big machine" of national education, therefore they are bound by signs that have been set nationally regarding what should be done. Such things are common everywhere.

Several studies (read: thesis) on PGSD FKIP Unram students, it is known that the implementation of a variety of methods for Educational Research courses is still lacking and the classroom climate does not motivate students to enjoy studying Educational Research. Ideally, lecturers can utilize the problems encountered in their classes as research study topics. Thus, lecturers have the opportunity to use various learning methods that can arouse students' curiosity, interest and motivation to achieve the highest learning achievement. Thus, the weakness of one method can be overcome by utilizing other methods as eclectic methods or even applying new methods in learning.

Seeing its urgency for students, the application of reflective methods in Educational Research courses is needed to improve students' knowledge and understanding abilities, the ability to apply their knowledge and understanding, the ability to analyze, synthesize and evaluate the data processing they do. Based on this background, the problem formulations raised in this study are: (1) how is the application of reflective methods in learning Educational Research; (2) how are the learning outcomes of Educational Research of experimental group students after the application of reflective methods; and (3) how far are the differences in Educational Research learning outcomes in experimental group students and control groups after the application of reflective methods to the experimental group.

Keeping the research in focus, the formulated objectives to be achieved are to obtain: (1) an overview of the application of reflective methods in learning Educational Research, (2) an overview of the Educational Research learning outcomes of experimental group students after the application of reflective methods, and (3) differences in Educational Research learning outcomes of experimental and control group students after the application of reflective methods in the experimental group.

Various experts say that reflective means practice, skill training, or training. Surakhmad (1982), Djamarah and Zain (2006) interpret that reflective as a method can be used to obtain a dexterity, accuracy, and skill. As a way of teaching, reflective can instill certain habits and maintain good habits. Defines reflective as a learning method by doing certain activities to gain higher dexterity or skills about something that has been learned. By practicing practically, the knowledge of skills that students have can be improved and perfected. Reflective is not synonymous with repetition because only by repetition there is no change towards improvement and perfection. Reflective is a natural method used to acquire motor skills or movements, mental skills, and associations made by learners.

This research limits the notion of reflective as a skill learning method in which students perform certain activities to gain higher proficiency, accuracy, speed, and skill about something (Educational

Research) they learn. The implementation, reflective must be preceded by understanding and understanding (explanation), that is, students must understand what they are learning, what they should do and what is the relationship with their competence as prospective teachers.

Research Method

This study was a pre-experimental research design. The experiment was conducted on one group of fifth semester students of PGSD FKIP Unram, class V / D morning who programmed the Educational Research course on KRS (Study Plan Card). This group will be tested pre-test and post-test. The first test (pre-test) is given before the application of the reflective method, and the second test (post-test) is given after the reflective method treatment. The pre-test results and post-test results will be compared to determine the impact of the application of reflective methods in learning Educational Research. This research design can be described as follows.

Table 1: Pre-Experimental Research Design One Group Pre-Test Posttest Design

Group	Treatment	Pre-Test dan PostTest
Eksperiment	X (Reflektif)	(T1) dan (P1)

Description:

- X = Reflective Method Treatment
- T = pretest and posttest tests
- P = meeting in learning

Treatment (X) to the experimental group was carried out to see the goodness of the reflective method in learning. Learning with reflective methods is a treatment (treatment) X that familiarizes students with direct practice in preparing proposals, preparing reports (Educational Research). Through a series of reflective stages (recognize, formulate and solution, problem solving) which are carried out continuously) test (T) student learning outcomes (posttest) after reflective treatment (X) is imposed. The test results of the experimental group and the control group were compared.

1.Population and Sample

The population of this study were all PGSD FKIP Unram Semester V students who programmed the Educational Research course. Information obtained from the Head of the Department of Education, FETT Unram, PGSD students have varying levels of ability. Some have high, medium, and some have low abilities. The sample of this study was 50 students of class V / D who were appointed by purposive random sampling, namely sample members were randomly appointed from research that had a specific purpose. The typical goal here is an effort to improve student learning outcomes in Educational Research courses.

2.Research Instruments

The research instruments used for data collection in this experimental research are pretest and post-test. The test instrument (pretest and posttest) is in the form of questions that are arranged in such a way as to reveal the ability of students in learning Educational Research in the realm of knowledge ability, ability to distinguish, ability to calculate, and ability to interpret. The instrument that has been arranged, first calibrated each item by conducting a validation test with the product moment correlation

technique by Pearson, testing its reliability with the split-half technique with the Spearman-Brown formula, and calculating the level of difficulty and differentiation.

Based on the results of the calculation, it is known that the validity of the instrument with an r value moves from - 0.0434 to 0, 722. The results of consultation at the 5% significance level table obtained 28 valid items from 30 items tested. The reliability of the question obtained the amount of reliability $r = 0, 699$. Thus, the test instrument is declared reliable. Likewise with the level of difficulty and differentiation. The results of the trial on 20 PGSD FKIP Unram students obtained the highest score of 92 and the lowest score of 28. Analysis of the level of difficulty of the instrument showed 4 items classified as difficult, 14 moderate, and 10 easy. After revision and modification, the level of difficulty of the items in the ratio of easy, medium, and difficult in the ratio of 5:14:5. This ratio is considered adequate to reveal the ability of students' Educational Research learning outcomes. The thing with the differential power. From the calculation results, it is known that the discrimination index is between 0.40 to 0.75. Thus, the test results of this test instrument show the items in the category of 4 items are sufficient, 18 items are good and 6 items are very good.

3. Assumption Test

The distribution normality test was carried out on the scores of the reflective method application instrument and the learning outcomes instrument (Educational Research test) on 50 experimental group students, after the research was carried out. The results of data processing found that the scores of the reflective method were normally distributed. The data shows that the price of X^2_0 is greater than the price of X^2_t at the degree of freedom (db) = 1 and 95% confidence level, namely: $X^2_0 = 5.80 > X^2_t(\text{db}.1)(\text{tk}.95\%) = 3.841$. The distribution normality test on the scores of student learning outcomes shows normal distribution. The distribution normality test results show that the price of X^2_0 is greater than the price of X^2_t at the degree of freedom (db) = 1 at both the 95% and 99% confidence levels, namely: $X^2_0 = 13.71 > X^2_t, (\text{db}.1)(\text{tk}.95\%) = 9.48$ with $(\text{db}.1)(\text{tk}.99\%) = 13.277$.

The case with homogeneity of Variance. The assumption of homogeneity of variance is set in order to have a strong foundation in generalizing. Because this study has set the research setting in the PGSD FKIP Unram study program, the same semester (V), the same morning class, the same lecturer, and relatively the same learning conditions. So, the homogeneity of variance test using Educational Research analysis is not needed.

4. Data Analysis Technique

Data were analyzed using descriptive statistics and normalized gain $\langle g \rangle$. Data description utilizes percentage techniques to facilitate understanding in reading the research results. Posttest and pretest data will be analyzed for gain (improvement) by using normalized gain $\langle g \rangle$ then the results are consulted on the normalized gain index.

The classification of the increase in mastery of the subject matter is characterized by the magnitude of $\langle g \rangle$, which is high if greater than 0.7; medium if between 0.3 to 0.7; and low if less than 0.3. Student learning outcomes are said to increase convincingly (significantly) if the normalized gain score of the post-test class average is higher than the pre-test.

Experimental research is vulnerable to various threats to the validity (internal and external) of research results. Internal validity concerns the level of quality of the accuracy of controlling the physical-psychological aspects of the implementation of research and the utilization of various instruments in the implementation of research. Control of various validity threats is carried out to minimize bias in research results. Controls were carried out from the preparation of the research until the end of the research implementation, concerning: 1) control of selection bias in determining the research sample; 2) control of location bias or the place where the research was conducted; 3) control of *instrumentation bias/testing*

effects related to the preparation of instruments that are suitable for use and the application of test-posttest data collection; 4) *control of maturity effect* related to research time restrictions; and 5) *control of Hawthorne effect* related to impressions arising in research subjects.

5. Research Procedure

This research consists of three stages, as follows:

Stage I (Research preparation), including: identifying problems to be studied related to learning Educational Research, preliminary studies, namely by studying literature and observing research classes, making research proposals or formulating problems, formulating theories and making hypotheses, determining research methods and designs, determining variables and data sources, compiling instruments to be used in research, conducting research studies-experimental studies, test and non-test instruments, analyzing test instruments and revising test instruments based on test results, and analyzing non-test instruments and revising instrument items that do not meet the requirements.

Stage II (research implementation), including: explaining to students that this class will be conducted reflective method research, before the learning process is carried out; conducting treatment in the experimental class, namely by applying reflective methods for six meetings (3 sessions), namely the 4th and 5th meetings (session-I), 9th and 10th meetings (session-II), and 11th and 12th meetings (session-III). During the treatment process, observations and various controls on the application of reflective methods in the implementation of the treatment were carried out, giving a pretest before treatment and a posttest after the treatment process was carried out.

Stage III (data analysis, data processing and conclusion drawing), including: collecting quantitative data and qualitative data, processing and analyzing quantitative data in the form of pretest and posttest results and finding the average of each test result, and processing and analyzing qualitative data in the form of reflective method questionnaire results.

Results and Discussion

1. Normalized Gain <g> Test Results

It is obtained an overview of the impact of the application of reflective methods on the increase/improvement (gain) of student learning outcomes, by converting research data into a scale of 0 - 100. The extent to which the gain of student learning outcomes in the post-test will be compared with student learning outcomes in the pretest, through the work table and the gain formula below will be known to increase student learning outcomes after the application of reflective methods in learning Educational Research.

Table 2 Learning Outcome

I	Pretest Learning Outcome				Posttest Learning Outcome			
	F	x'	fx'	fx' ²	f	y'	fy'	fy' ²
87 – 100	1	+2	2	4	5	+2	10	20
74 – 86	3	+1	3	3	16	+1	13	13
59 – 73	13	0	0	0	19	0	0	0
46 – 58	20	-1	-17	17	7	-1	-7	7
32 – 45	13	-2	-26	52	3	-2	-6	12
Σ	50	-	-38	76	50	-	10	52

Based on the data tabulation above, it is known that the mean (average) student learning outcomes in the pretest = 53.05 and posttest = 69.41. Then after calculating with the gain formula, the

result is 0,348. The gain index shows $\langle g \rangle$ of 0.348 including the medium category. Thus it can be concluded that there is an impact of applying reflective methods on improving student learning outcomes in Educational Research. The increase in the average score of student learning outcomes in the pretest (53.05) increased in the posttest (69.41). The increase in the average student learning outcomes of 16.36 is significant in the medium category.

2. Discussion

The reflective method is a method that accustoms students to do exercise tasks (working on problems) immediately after the provision of material by educators (lecturers). Through a series of exercises that are designed for the purpose of improving knowledge and skills and monitored by lecturers, students can practice doing problem-solving tasks while practicing discipline to immediately apply their knowledge in exercises.

Although skill exercises dominate learning, the reflective method does not neglect the cultivation of concepts and transfer of knowledge through its first activity stage, the integrative stage. The lecturer presents the material at this stage as well as asking questions and must be answered by students to find out the Stimulus-Response connection. As prospective teachers, PGSD students are also provided with information about the benefits, functions, and the relationship between their learning materials and their competencies later as elementary school teachers. Thus, both the understanding and practice materials presented by the lecturer are as much as possible related to learning in elementary schools.

At the stage of introducing the problem, the lecturer focused on exercises to find the problem and compile the background by minimizing the occurrence of errors, and gradually increasing the tempo of doing the task to be more in-depth.

At the stage of formulating the problem and its solution, students have been able to do the task well. Confidence is increasing, efforts to solve the problems they encounter have grown along with the ability to distinguish, analyze, and evaluate. Towards the application of a good reflective method, the researcher lecturer strives for good reflective traits to be applied from the beginning, namely:

First, each student did a different exercise from the previous exercise. This happened because the material/topic of each meeting was different. Secondly, changes in learning situations and conditions demand different responses, so the researcher lecturer applies a variety of humor related to the learning material. Third, there are skills that can be mastered or perfected in a short time with minimal practice, while some require a long time with maximum practice. Fourth, a skill exercise must be preceded by understanding and comprehension, i.e., students must understand something they have to do and what the exercise has to do with competence. The reflective method has a number of principles for the purposes of skill training, namely: a) practice is only for action skills that are responsive (stimulus-response); b) practice must have meaning in the broader sense of behavior (meaningful to competence). Before being given an exercise, students need to first understand the meaning of the exercise, the benefits of the exercise, have an attitude that the exercise is useful for the next task; c) the values of the exercise are diagnostic in the sense that the initial stage of the student does not yet have adequate skills; the next exercise is an effort to correct mistakes; continued by showing the correct response; and a variety of exercises is held so that there can be an increase and perfection of skills; d) training begins with accuracy and continues with speed and at the end both (accuracy and speed) must be achieved as a unit; e) the training period is short so as not to be boring; f) the training period must be interesting and fun so that the results are satisfactory; g) at the time of training, essential processes are prioritized; h) individual differences must underlie training, and individual training is needed before strengthening training in groups (Dede Rahmat Hidayat and Aip Badrujaman, 2012).

Conclusions and Suggestions

1. Conclusion

Based on data analysis of the results of research that has been conducted on PGSD FKIP Unram students through the application of reflective methods in learning educational research, the following conclusions are obtained:

- a. The application of the reflective method in learning educational research has been able to improve the ability of PGSD undergraduate students with coherent implementation stages, namely the stages of recognize (identifying problems), problem solution (formulating problems and solutions), and rational idea (problem solving). Identifying problems by recognizing the problem first, then writing it in the background while still prioritizing the rationalization of the problem. Furthermore, alternative solutions are offered in a sustainable manner as a way out of the problems that have been previously stated.
- b. The learning outcomes of educational research of experimental group students are better than those of control group students. The data shows that the number of students with good grades (Guttman scale) is more in experimental group students, namely 88% (44 people-50 samples) compared to control group students 58% (29 people-40 samples).
- c. The results of the test of the difference in the mean score of the experimental group students and the mean of the control group utilizing the t.Test formula found a difference in the mean score of the experimental group students of 66.224 versus 59.660 higher mean score of the experimental group students. The obtained t.Test significance test (t_o) and t.Table (t_t) shows: $t_o = 2.319 > t_t$ ($t_{(95\%)}(50) = 2.010$ (interpolated). Thus the difference in the mean learning outcomes of 6.564 is significant at the 95% confidence level. The mean score of the experimental group students' learning outcomes is better than the mean score of the control group's learning outcomes. In other words, this research is categorized as successful.

Suggestions

Suggestions that need to be given after this research are as follows:

1. For Students. The results of observations show that the interest, motivation, discipline and enthusiasm of students in participating in educational research lectures are quite high and can even be said to be high. The indicators are 1) students are rarely found late in attending lectures; 2) The academic climate of the class is very conducive, especially when practicing working on compiling backgrounds, compiling question instruments; 3) Student interest, motivation, discipline and enthusiasm in learning are quite high, this can be seen from their diligence in doing all tasks in learning.
2. For Lecturers. Good learning is when students are motivated to learn, therefore lecturers need to create a pleasant learning atmosphere, namely by interspersing fresh humor with character value.
3. For Institution Management. Institutions need to facilitate learning that can arouse student interest and learning discipline. The better the learning climate that lecturers can create, the better the impact on student achievement in the future and leads to the creation of PGSD undergraduate outcomes that are able to compete in the job market.

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