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The effect of the guided inquiry learning model on student's learning outcomes in fractional materials in fifth grade elementary school

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Abstract

Student's' mathematical abilities will only become material that follows a series of procedures without knowing its meaning if students' reasoning abilities are not developed. The purpose of the study was to determine the effect of the Guided Inquiry learning model on student learning outcomes on fraction material in grade V Elementary School. This type of research uses a quantitative approach. The design uses a quasi-experimental design with an equivalent control group design. The sample consists of 2 groups, namely group 1 using conventional learning, group 2 using the Guided inquiry model. The research instrument was in the form of test scores (pre-test scores and post-test scores). Data analysis techniques in the form of normality test, homogeneity test, t-test. The results showed that there was an influence of the Guided Inquiry learning model on the student learning outcomes of fractions in grade V Elementary School with an average of 74.84%.

Keywords: Guided Inquiry, Conventional, Learning Outcomes, Fractions

INTRODUCTION

Education is the main pillar of the establishment of a nation or state by developing and improving quality human resources. The existence of reforms in the world of education carried out in a planned, directed, and sustainable manner will create superior humans who are ready to compete in the intense global competition. Education is the first step in entering a new world in global competition so that it does not lag behind other countries, and can catch up with countries that are already superior in terms of the quality of human resources.

According to (Leonard, 2013) "Education as an indicator of the nation's progress is seen as important in the development process". This is in accordance with the objectives of national education as stated in Law no. 20 of 2003 Chapter I, Education is a conscious and planned effort to create a learning atmosphere and learning process so that students actively develop their potential to have religious spiritual strength, self-control, personality, intelligence, noble character, and skills needed for themselves. society, nation and state.

The role of the teacher is not only as a transfer of knowledge or the teacher is the only source of learning (teacher center), but the teacher as an active mediator and facilitator to develop the active potential of students in him. Knowledge, independence, and experience of teachers are integrated in creating effective and professional

learning conditions to make them more varied, meaningful, and fun. Problems in learning are internal and external problems. Internal problems in students include: learning attitudes, learning motivation, learning concentration, self-confidence, study habits, and ideals.

External problems include: teachers, facilities, learning infrastructure, assessment policies, social environment, and curriculum. (Leonard & Supardi U.S., 2010) said that basically students' mathematics learning outcomes are influenced by several factors, including students' attitudes towards mathematics, self-concept and student anxiety in learning; in addition to other external factors. The external problem, namely the teacher, is the lack of variety of learning models. Teachers need to keep up with the times, creativity and innovation are needed in the development of integration rules with new learning models in accordance with the times in carrying out teaching and learning activities so that learning activities are more active, creative, innovative, and fun so as to create good multi-interaction between teachers and students, students with teachers, students with learning media and learning resources, as well as students with other students. Therefore, the teacher as one of the important components of learning success, must be able to position himself as a figure who is able to awaken the ability of students to continue learning.

From these problems, a learning model that is suitable for learning objectives is needed so that it can be achieved. The development of learning has developed, both personal learning methods, learning media, or learning processes, and the use of learning models is an example of developments in the field of science.

A solution is the use of appropriate learning models, a learning system is needed that is able to develop the abilities of students while being able to foster student creativity, the use of the Guided Inquiry learning method is an alternative that is very appropriate to the times. Guided inquiry approach is a method that is able to lead students to realize what they have learned during learning. Inquiry places students as active learning subjects (Mulyasa, 2005). This model can be applied to the learning process to achieve predetermined competencies.

By using Guided Inquiry learning, it is hoped that the learning outcomes will be more meaningful for students. The learning process takes place naturally in the form of student activities working and observing students are required to be active, not transfer knowledge from teachers to students.

Guided Inquiry learning process, with the active involvement of students means that the teacher does not take away the child's right to learn in the true sense. So that students get the opportunity and facilities to build their own knowledge to gain a deep understanding, and can improve the quality of students.

Although this approach is centered on student activities, the teacher still plays an important role as the designer of the learning experience. Teachers are obliged to lead students to do activities. Sometimes teachers need to provide explanations, ask questions, provide comments, and suggestions to students. Teachers are obliged to provide ease of learning through the creation of a conducive climate, by using various media facilities and learning materials. This approach involves them in intellectual activities, requiring students to process learning experiences into something meaningful in real life. Thus, through this method students are accustomed to being productive, analytical and critical.

The steps in the inquiry process are awakening curiosity about something, predicting an answer, and drawing conclusions and making valid decisions to answer problems supported by evidence and then using conclusions to analyze new data. The strategy for implementing the inquiry is; 1) the teacher provides explanations, instructions or questions on the material to be taught; 2) giving assignments to students to answer questions, the answers of which can be found in the learning process experienced by students; 3) the teacher provides an explanation of the problems that may confuse students; 4) recitation to impart previously learned facts; and 5) students summarize in the form of a formulation as a conclusion that can be accounted for (Mulyasa, 2005). Bruner (in Mulyasa, 2005) states that the advantages or advantages of learning with a guided inquiry approach are; a) inquiry learning increases students' intellectual potential; b) students who have succeeded in finding themselves so that they can solve existing problems will increase their intellectual satisfaction which actually comes from students; c) students can learn how to make discoveries only through the process of making the discovery itself; d) learning through inquiry, students can understand the concepts and ideas better; e) learning is more student-centered; f) the inquiry learning process can form and develop self-concept; g) through inquiry learning it is possible to

increase the level of hope; h) inquiry learning can develop talents including academic talent; i) inquiry learning can prevent students from learning by rote; and j) inquiry learning can give students time to assimilate and accommodate information.

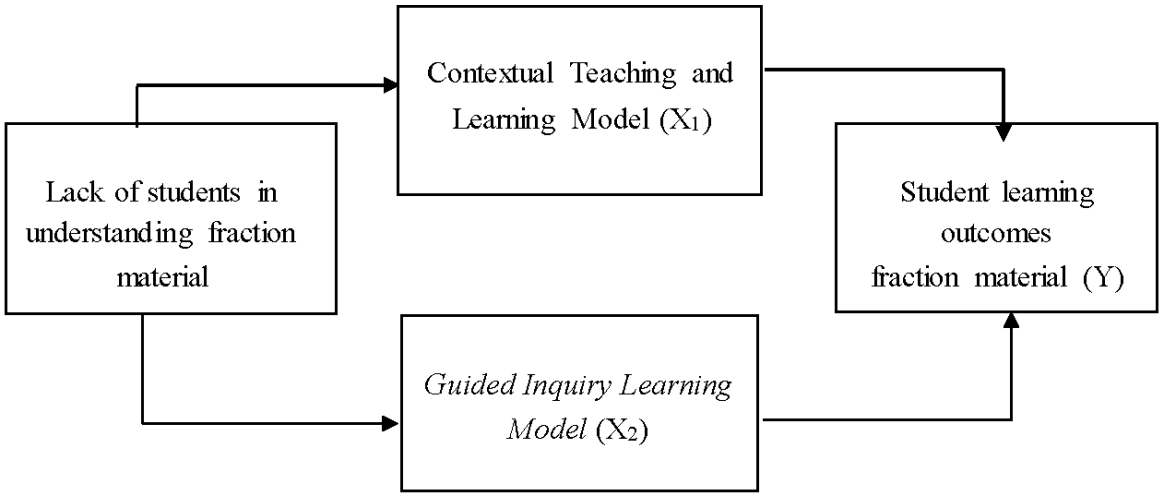
Based on the existing problems, the authors are interested in researching an active learning method, where students are the center and can develop two-way teaching methods. The method that will be developed is the Guided Inquiry learning model. This research is entitled "The Influence of the Guided Inquiry Learning Model on Student Learning Outcomes in Class V Fraction Materials for Elementary School Students. Fractions are one of the core studies of mathematical material that students learn in elementary schools (SD). According to (Sukawati and Marfuah, 2010:1) the discussion of the material focuses on basic arithmetic operations, namely addition, subtraction, multiplication, and division, both for ordinary, mixed and decimal fractions. By studying the material above, it is hoped that students will be able to understand the material for operating ordinary and mixed fractions.

The researcher's assumptions are supported by the results of research conducted by Nur Idyatul Fitri (2008) with the title "Using the Inquiry Discovery Method to Improve Learning Achievement in Economics Subjects in Class X MA Mualimat NW Pancor in the 2007/2008 Academic Year", concluding that there is an increase in the average student achievement during learning in each cycle, where in the initial test with an average value of 61.77, the formative average value of the first cycle was 65.62, from the second cycle the average value was 69.22, and the first cycle III the average value is 71.25.

Another research that is considered relevant to this research is the research conducted by Anhar (2009) with the title "Contextual Inquiry Learning Model To Improve Motivation and Learning Achievement in Social Studies Subjects in Class VIII of SMPN 3 Pringgabaya Academic Year 2008/2009", concluded; 1) an increase in the average student learning motivation during learning in each cycle, where in the first cycle the average student learning motivation is 16.40 or the low category and in the second cycle the average student learning motivation is 23.20 or the high category. This means that there is an increase in student learning motivation, and 2) an increase in student learning achievement, this is seen from the number of students who have mastery learning in each cycle, where in the first cycle the number of students who have mastery learning is 19 people or 47.50% and in Cycle II the number of students who have complete learning is 31 people or 77.50%. Based on this research, it is hoped that it will improve student learning outcomes, but doubts arise about the learning model. Does this learning model really affect the learning outcomes of fifth graders in elementary school? Therefore, in this study, we will conduct a mathematics learning experiment using a learning model with the title "The Effect of Guided Inquiry Learning Model on Student Learning Outcomes on Fractions in Grade V Elementary School.

Conceptual Framework

While the framework for this search will be described in the following table:



Research Objective

1. To determine the effect of the contextual learning model on student learning outcomes in fractional school basic materials.
2. To determine the effect of the guided learning model on student learning outcomes in fractional materials in grade V of elementary school.
3. To find out, there are significant differences in the contextual teaching and learning model, conventional making and consulting about student learning outcomes in basic materials in primary schools.

METHODS

In this study, the approach used is a quantitative approach, considering that the data to be collected is in the form of numbers. As the opinion that says that "Quantitative research is as the name implies, many are required to use numbers, starting from data collection, interpretation of the data and the appearance of the results" (Suharsimi, 2002).

While the method used is the experimental method (quasi experiment). Sugiyono (2012:114) argues that a quasi-experiment is an experiment that is difficult to do because there is a control group and does not have a complete function in controlling external variables. In the experimental class, learning will be carried out using the Guided Inquiry learning model through the experimental method and in the control class, learning will be carried out using a conventional approach. With the design of "nonequivalent control group design".

The design of a study is largely determined by the purpose of the research itself. In connection with the purpose of this study, namely to determine the effect of the Guided inquiry learning model on student learning outcomes, the experimental design used was the pre-test, post-test control group design. The patterns are:

E O1 X O2
E O3 X O4

E is the experimental group
K is the control group
O is the result of observation
(Suharsimi, 2002: 80)

In this case, the difference in achievement between the experimental group (O1 – O2) and the achievement of the control group (O3 – O4) is seen. To apply the pre-test, post-test control group design, when conducting research, the researcher will make observations of both groups twice, namely before the experiment and after the experiment. Observations made before the experiment (O1 and O3) are called pre-test, and observations after the experiment (O2 and O4) are called post-test. Where the difference between O1 and O2, O3 and O4 is assumed to be the effect of the treatment or experiment carried out.

The population is all research subjects (Suharsimi, 2002: 108). According to Fraenkel and Wallen in Yatim Riyanto, the population is a group that attracts researchers, where the group is used by researchers as objects to generalize research results. The population in this study were 248 students of class V Elementary School Gugus Dewi Sartika, Dempet District.

The research sample was taken using the Purpose Sampling technique so that it was obtained SD Negeri Balerejo 1 which amounted to 33 students as the experimental class, SD Negeri Balerejo 3 which amounted to 30 students as the control class. Class V SD Negeri Balerejo 1 as an instrument test class. Data collection techniques in this study were pretest and posttest forms. The data analysis technique in this research is to use quantitative analysis consisting of prerequisite tests (normality test and homogeneity test and inferential test (t-test)

The data collection of this research was carried out in several ways, namely: observation, test and documentation. With the observation method, the researcher observed the behavior of the students who were

given the Guided Inquiry approach with the discovery method in the learning process. So by using this method, researchers will obtain data on; activeness, motivation, student enthusiasm and student cooperation. The test was conducted to determine the effect of the treatment given in the form of a Guided Inquiry approach with the discovery method on increasing historical learning achievement. Where in this test method, the researcher uses a test instrument that contains a number of questions that will be given before and after the experiment. With the documentation method, researchers take data in the form of books, documents, regulations and so on so that the data obtained is easy to process. With this method, researchers will get data in written form regarding student data.

Data analysis in this study, using statistical analysis with data description procedures, and test requirements analysis. Things that need to be considered in the preparation of the data are "only enter data that is important and really needed, between the information data and the respondent's personal impression." (Margono, 2002). So here it can be understood that not all data can be entered but it is really chosen which data are important and really needed. Before the researcher begins to analyze the data, there is one very important work that is often forgotten (ignored). It is important to pay attention to the data that is processed. The selection of analysis techniques and intervals is determined by several factors, including the distribution of the data. For certain techniques, the normal requirements must first be checked whether they really meet the intended requirements. Among these requirements, besides being normal, it must also be homogeneous. In connection with the requirements that must be met before.

FINDINGS AND DISCUSSION

The distribution of pre-test results in the experimental group has a range of 33-67 with a mean of 52.96 and a standard deviation of 10.24. The full distribution is as follows:

Sebaran hasil pretest pada kelompok eksperimen memiliki rentangan 33 – 67 dengan rerata 52,96 dan standar deviasi 10,24. Sebaran selengkapnya sebagai berikut:

Tabel 1. Distribution of Pre-Test Results of the Experimental Group

Interval	Frekwensi		Frekwensi Comulatif	
	Angka	Percentage	Angka	Percentage
33 – 38	4	12,1%	4	12,1%
39 – 44	2	6,1%	6	18,2%
45 – 50	3	9,1%	9	27,3%
51 – 56	7	21,2%	16	48,5%
57 – 62	16	48,5%	32	97%
63 – 68	1	3,0%	33	100%
Total	33	~	~	~

The distribution of pretest scores in the control group ranged from 33 to 62 with a mean of 46.67 and a standard deviation of 8.56.

Tabel 2. Distribution of Pre-Test Results of the Countrol Group

Interval	Frekwensi		Frekwensi Komulatif	
	Angka	Persen	Angka	Persen
33 – 37	3	10%	3	10%
38 – 42	4	13,3%	7	23,3%

43 – 47	8	26,7%	15	50%
48 – 52	9	30%	24	80%
53 – 57	3	10%	27	90%
58 – 62	3	10%	30	100%
Total	30	-	-	-

Dengan demikian berdasarkan data nilai hasil pre tes dari kedua kelompok, perolehan mean (rerata) dan standar deviasi dari masing-masing kelompok dapat dilihat pada tabel berikut:

Tabel 3. Data Recapitulation of Pre-Test Values for the Two Groups

Description	Eksperimental Group	Countrol Group
Maximum Value	68	62
Minimum Value	33	33
Range	6,15	4,83
Mean	52,96	46,67
Standard Deviation	8,56	8,52

That the average value of the experimental group's pre-test results and the control group's average pre-test results are not too much different, which only has a difference of 6.29. This indicates that the distribution of pre-test scores of the two groups is not too different, meaning that the initial ability before treatment is relatively the same.

Post-Test Result Data

The distribution of posttest value data in the experimental group has a range of 57 – 98 with a mean of 74.84 and a standard deviation of 10.24. The complete distribution is as follows:

Table 4. Distribution of Post-Test Results of the Experimental Group

Interval	Frequency		Frequency cumulative	
	Numbe	Persent	Angka	Persen
57 – 63	5	15,1%	5	15,1%
64 – 70	9	27,3%	14	42,4%
71 – 77	3	9,1%	17	51,5%
78 – 84	9	27,3%	26	78,8%
85 – 91	6	18,2%	32	97%
92 – 98	1	3%	33	100%
Total	33	--	--	--

The distribution of posttest results in the control group has a range of 30-83 with a mean of 50.00 and a standard deviation of 10,877.

Tabel 5. Distribution of Post-Test Results of Control Group

Interval	Frequency		Frequency Comulative	
	Numbe	Percent	Numbe	Percent
30 – 38	3	10%	4	10%
39 – 47	8	26,7%	11	36,7%

48 – 56	12	40%	23	76,7%
57 – 65	5	16,7%	28	93,4%
66 – 74	1	3,3%	29	96,7%
75 – 83	1	3,3%	30	100%
Total	30	-	-	-

Tabel 6. Data Recapitulation of Pre-Test Values for Both Groups

Description	Eksperiment Group	Controul Group
Maximum Value	95,65	78,26
Minimum Value	56,52	30,43
Range	6,5	8
Mean	74,84	50,00
Standard Deviation	10,24	10,877

If it is seen from the average and final scores of the two groups above, it can be said that the average posttest value of the experimental group is higher than the average posttest value of the control group, which has a difference of 24.84. This indicates that the distribution of post-test scores of the two groups is different, meaning that the final ability of the experimental group is relatively higher than the final ability of the control group. Thus, the categorization can be made as follows:

1. Mi + SDi to Mi + 3SDi = high category

75+10 to 75+30

85 to 100

2. Mi - SDi to Mi + SDi = medium category

75 - 10 to 75 + 10

65 to < 85

3. Mi - 3SDi to Mi - SDi = low category

75 - 3(10) to 75 – 10

45 to < 65

Based on the average obtained by the experimental group after treatment, which is 74.84, it can be seen that the quality level category of the influence of the use of the Guided inquiry model on student learning outcomes, after being consulted with the categorization above, it can be concluded that the quality level of the influence of the use of the Guided inquiry model on student learning outcomes the material for fractions in grade V Elementary School Dewi Sartika, Dempet sub-district is quite sufficient.

CONCLUSIONS AND RECOMMENDATIONS

Based on processing, analyzing data, submitting hypotheses, and discussing research findings, it can be concluded that there is an influence on the use of the Guided inquiry learning model on student learning outcomes in fractional material in class V Elementary School Gugus Dewi Sartika, Dempet District in 2021. This is based on the obtained value Sig. (2-tailed) obtained 0.000 < 0.05, or t-count 9.603 > t-table 1.68957, it can be concluded that there is a difference in the average class pre-test and post-test. The effect given is 20.69. Based

on the value of N Gain, the highest increase was in the medium category of 18 students or 51.43%. Overall, the results of the study showed that student learning outcomes in fractions material were successfully improved with the Guided inquiry approach.

AKNOWLEDGMENTS

In our opinion, the use of the Guided Inquiry model is more effectively used in order to improve student learning outcomes, especially in the material for counting fractions in class V Elementary School.

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