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Direct Learning Model to Improve Students' Mathematics Learning Outcomes: A Classoom Action Research

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Abstract

This article was to improve the student learning outcomes in the teaching and learning process thrugh direct learning model. The sample research was 32 students. The research used Classroom Action Research that conducted in two cycles. It consisted of four steps namely, planning, acting, observing, and reflecting. The procedures of research were performs by administrating two cycles. Each cycle contain four steps which are planning, action, observation, and reflection. The collecting data used test, observation, and interview. Analyzing data was calculated using simple statistics. The result showed that through direct learning models can streamline the teaching and learning process in the classroom in terms of student learning outcomes which continue to increase from the results of the pre-cycle 6.25%, the first cycle of 68.75%, and the second cycle of 90.63%. Based on the research findings, it can be concluded that the direct learning model can improve student learning outcomes, especially in mathematics subjects on the subject of fractions at MI Tarbiyatul Athfal Pasir Sakti.

Keywords: Direct Learning Model, Learning Outcome, Classroom Action Research

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INTRODUCTION

To Efforts in improving the quality of education must be carried out by moving all components that become subsystems in an education system. The first and foremost subsystem in improving the quality of education is the teacher factor (Odinokaya, et al., 2019; Budiharso, & Tarman, 2020; Latief, et al., 2019). It is in the hands of the teacher that learning outcomes which are one of the indicators of education are more determined, namely good learning as well as being valuable as an empowerment of the abilities and abilities of students (Madalińska-Michalak,O'Doherty, & Assunção Flores, 2018). To achieve optimal learning outcomes, creative and innovative teachers are needed who always have a continuous desire to improve and improve the quality of the teaching and learning process in the classroom.

The teachers got many learning problems, either related to learning models, understanding material, using methods (Retnawati, et al., 2018; Wulandari, et al., 2019), media or evaluation tools (Widodo, 2018; Stronge, J. H., & Tucker, P. D. 2020). There are many kinds of learning models each learning model has its own advantages and

disadvantages. The learning model is a plan or a pattern that is used as a guide in planning learning in class, or learning in tutorials and determining learning tools including books, films, computers, curriculum, and others (Hwang, et al., 2019; Singh, H. 2021). Mathematics is not knowledge that can be perfect for itself, but mathematics is mainly to help people understand and solve social, economic and natural mathematics problems. It grows and develops because of the thought proces; therefore logic is the basis for the formation of mathematics (Yunis, 2021). Based on the results of observations made on January 17, 2020 at MI Tarbiyatul Athfal Pasir Sakti on third grade students conducted by researchers, from 32 students consisting of 20 boys 12 girls there were 2 students who were declared complete. While, the remaining 30 students were declared incomplete. From these results it can be concluded that only 6.25% of students were declared complete, while 93.75% were declared incomplete. To overcome the problems above, the researchers used a direct learning model. The direct learning model is specifically designed to support student learning processes related to well-structured declarative knowledge and procedural knowledge that can be taught with a gradual, step-by-step pattern of activities (Fatmawati, et al., 2019; Simanjuntak, et al., 2018). The direct learning model is a teacher-centred, well-structured learning model with steps: preparing students to receive lessons, demonstrations, guided training, feedback, and advanced (independent) training.

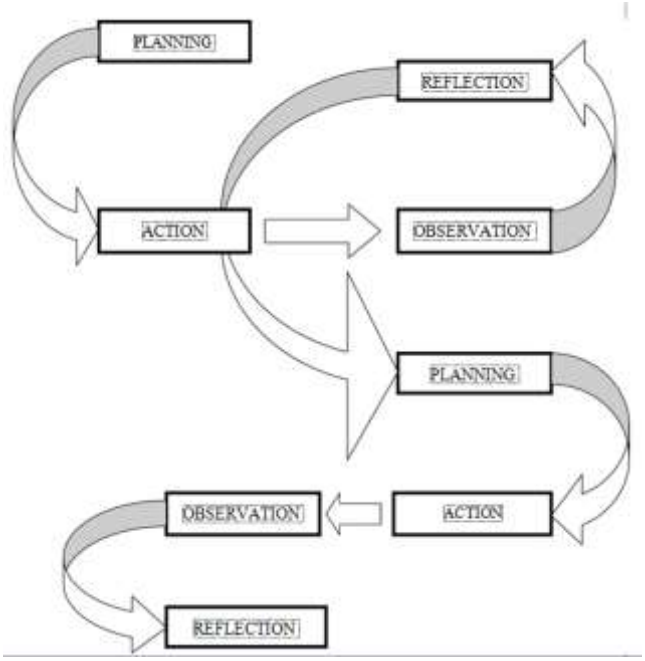
The direct learning model is important to use because it can be challenging to consider the gap between theory (what should be) and observation (what actually happened). This allows students to concentrate on the results of an assignment, not the techniques for producing them. This is important, especially if the student does not have the confidence or skills to do the task. The advantage of this model is that the teacher can also control the content of the material and the order in which the information is received by students, so that they can maintain focus on what students have to achieve. The purpose of this study was to improve mathematics learning outcomes for third grade students of MI Tarbiyatul Athfal Pasir Sakti

METHOD

The researcher used Classroom Action Research (CAR). It was directed at understanding how events or effects of an action take place (Rochiati, 2005; Kemmis and Mc Taggart, 2013). The subject was 32 students of class III A at MI Tarbiyatul Athfal Pasir Sakti, East Lampung regency. Data collection techniques used observation, interviews and tests. Observation activities are used to collect data about student activities in the teaching and learning process and using the direct learning model. An Interview was to obtain data about the success rate of the direct learning model. The test was used to obtain data about student learning outcomes. The researchers also held discussions between teachers, colleagues and collaborators to reflect on the results of the CAR cycle.

The basic concept allowed by Kurt Lewin was developed by Kemmis and Mc Taggart (2013). It consists of four steps namely, planning, acting, observing, and reflecting. Improvement the problem in this research is brought about by the series of cycle. The procedures of research are performs by administrating two cycles. Each cycle contain four steps which are planning, action, observation, and reflection.

Figure 1. Classroom Action Resarch by Kemmis and Mc Taggart (2013).



In here, the researchers use a Classroom Action Research (CAR) designed by Kemmis and Mc Taggart model that consist of four steps namely, planning, acting, observing, and reflecting. Improvement the problem in this research is brought about by the series of cycle. The procedures of research are performs by administrating two cycles. Each cycle contain four steps which are planning, action, observation, and reflection. Before the cycle I begun, orientation test is administrated to identify the basic knowledge of the students about speaking skill. After finishing the first cycle, it might be found a new problem or the previous unfinished problem yet. Therefore, it is necessary to continue to the second cycle in line it the same concept of the first cycle

The tesearchers used qualitative descriptive analysis techniques, which are research techniques that describe reality or facts in accordance with the data obtained with the aim of knowing the learning outcomes achieved by students as well as to obtain student responses to learning activities and student activities during the learning process. This analysis is carried out by providing evaluations in the form of written test questions and oral tests at the end of each cycle. This analysis is calculated using simple statistics

RESULTS AND DISCUSSION

This Classroom Action Research was conducted at MI Tarbiyatul Athfal Pasir Sakti. Madrasah identity, principal identity, school vision and mission, school infrastructure data, student data, teacher data as attached in the attachment of this thesis.

This classroom action research uses a direct learning model on the Weather Theme Sub-theme 3 The influence of weather on human life. Learning 1 and 3 of Mathematics learning materials about fractions has been designed by the researcher in cycle II, starting with cycle I and then continuing with cycle II. The research was carried out from January 17, 2020 to January 31, 2020 at MI Tarbiyatul Athfal Pasir Sakti, Pasir Sakti sub-district, East Lampung district

Pre-Cycle Stage

Based on the results of the test of the Mathematics subject instrument theme 5 on fractions and the addition of fractions with the same denominator which was held on Friday, January 17, 2020, the 3rd grade students of MI Tarbiyatul Athfal Pasir Sakti, Pasir Sakti sub-district, East Lampung district found several problems, including the following: the following:

a. students do not understand the meaning of fractions
b. students do not understand the meaning of adding fractions with the same denominator
c. students have not been able to solve problems related to fractions
d. Students' completeness percentage is still low

The above problems are based on observations as a prerequisite for Classroom Action Research conducted on 17 to 31 January 2020 in the subject of mathematics theme 5 concerning fractions and adding fractions with the same denominator, grade 3 students at MI Tarbiyatul Athfal Pasir Sakti, Pasir Sakti sub-district, East Lampung district, data analysis and calculations are as in the following table:

Table 1 Learning Outcomes of Pre-Cylce

No	Name Students	Score	Value	Description
				Completed / Not Completed
1	Aditya	2	25	Not Completed
2	Ahmad	1	12.5	Not Completed
3	Anggara	3	37.5	Not Completed
4	Astrid	2	25	Not Completed
5	Aulia	1	12.5	Not Completed
6	Azril	1	12.5	Not Completed
7	Dinda	2	25	Not Completed
8	Fahri	1	12.5	Not Completed
9	Fajri	3	37.5	Not Completed
10	Fatiyan	1	12.5	Not Completed
11	Assemble	2	25	Not Completed
12	Hidayatul	2	25	Not Completed
13	Khana	3	37.5	Not Completed
14	Lutviana	4	50	Not Completed
15	M. Rizky	3	37.5	Not Completed
16	Maryatul	4	50	Not Completed
17	Maulana	3	37.5	Not Completed
18	Melfi	3	37.5	Not Completed
19	Muhammad	5	62.5	Completed
20	Iqbal M.	4	50	Not Completed
21	Nassya	2	25	Not Completed
22	Nur	2	25	Not Completed
23	Raditya	3	37.5	Not Completed

No	Name Students	Score	Value	Description Completed / Not Completed
24	Rafa	3	37.5	Not Completed
25	Rany	4	50	Not Completed
26	Rizky MP	2	25	Not Completed
27	Rizqy DS	2	25	Not Completed
28	Muhammad	2	25	Not Completed
29	Salsabila	5	62.5	Completed
30	Tristan	3	37.5	Not Com
31	Windi	2	25	NotCompleted
32	Yusril	3	37.5	Not CompletedCompleteness
Percentage of				**6.25%**
Percentage of Incompleteness				**93.75%**
Average				**32.42**

Lanjutan

Table 2 Data Analysis

Description	Formula	Calculation	Results
Individual Completeness	KB =T/Tt X100	KB = 2 / 8 x 100	25
Percentage of classical completeness	P = S 70 x 100 % St	P = 2/32 x 100%	6,25 %
Average	MX= (∑X)/N	X = 1,037,5 /32	32,42

Information:
KB = complete learning
T = total score obtained by students
Tt = total score total
P = Percentage of completenesscompleteness

Classical learning ∑ S ≥ 60 = Number of students who scored ≥ 60 ∑ St Number of students who took thetest
MX = average
X = sum of all student scores
N = Number of subjects/number of students

Result of analysis from the table above, there are 2 students or 6.25% who are declared complete, 30 students or 93.75% are declared incomplete. The average is 32.42, and individual learning completeness is still low, which is a problem that would be discussed in this study.

Cycle 1

a. Planning

Action planning activities carried out are:

1) Setting competency standards and basic competencies.
2) Develop a Learning Implementation Plan.
3) Prepare observation sheets for learning.
4) Prepare observation sheets for student and teacher activities in the classroom,
5) Prepare learning tools.
6) Prepare evaluation sheet.

b. Implementation

CAR is carried out by researchers after carrying out systematic planning. The steps for class action are as follows:

1) Starting learning by doing apperception and introducing themselves to students.
2) Deliver basic competencies, indicators, achievements.
3) Researchers convey learning objectives and prepare students (attract, focus, and motivate students)
4) Researchers direct students to observe and understand fractions and addition of fractions according to student books.
7) Students are asked to give examples of fractions on concrete objects.
8) Researchers explain fractions and addition of fractions, using concrete objects and explain the steps and examples.
9) Supervised Training

   Researchers provide practical and written exercises to students on fractions and addition of fractions with the same denominator while checking and helping students' difficulties.

   The form of the test instrument is as follows:

   Question:

   (a) Mother brings 1 sponge cake pan, then the cake is cut into 4 parts. On the bus, Dayu ate 1 piece of cake, then dad ate 1 piece. How many pieces of cake have you eaten?

   Answer :$\frac{2}{4}$ or $\frac{1}{2}$

   (b) Dayu brought 1 chocolate bar containing 10 pieces of chocolate. On the way, Dayu ate 3 pieces of chocolate. Mother ate 2 pieces of chocolate. How many pieces of chocolate did Dayu and mother eat?

   Answer :$\frac{5}{10}$ or $\frac{1}{2\ My}$

   (c) father bought 1 block of sweet bread, the bread was cut into 5 parts. Mom ate 1 piece, dad ate 2 slices. How many pieces of bread did mom and dad eat?

   Answer :$\frac{3}{5}$

   (d) $\frac{1}{3} + \frac{1}{3}$ = ...

   Answer $\frac{2}{3}$

   (e) $\frac{2}{8} + \frac{3}{8} = \cdots$

   Answer $\frac{5}{8}$

   (f) $\frac{3}{9} + \frac{3}{9} + \frac{3}{9} = \cdots$

Answer $\frac{9}{9}$ or 1

(g) $\frac{2}{8} + \frac{1}{8} + \frac{3}{8} = \cdots$

Answer $\frac{6}{8}$

10) Checking understanding and giving feedback
Researchers give quizzes and check students' understanding, and provide feedback on student responses regarding material that is not understood in the guided training.

5) Researchers close the lesson

c. Observation

Observations are carried out when the learning process takes place. Observations in CAR are data collection activities in the form of a process of changing the performance of the teaching and learning process. Observations in the class using the direct learning model obtained data on student learning outcomes and calculation of data analysis as shown in the following table:

Table 3 Learning Outcomes of Cycle 1

No	Student Name	Score	Value	Description
				Completed/ Not Complated
1	Aditya	3	37.5	Incomplete
2	Ahmad	6	75	Completed
3	Anggara	5	62.5	Completed
4	Astrid	6	75	Completed
5	Aulia	6	75	Completed
6	Azril	7	87.5	Completed
7	Dinda	7	87.5	Completed
8	Fahri	3	37.5	Not Completed
9	Fajri	7	87.5	Completed
10	Fatiyan	4	50	Not Completed
11	Galang		8100	Completed
12	Hidayatul	6	75	Completed
13	Khana	4	50	Completed
14	Lutviana	6	75	Completed
15	M. Rizky	6	75	Completed
16	Maryatul	8	100	Completed
17	Maulana	5	62.5	Complete
18	Melfi	4	50	Incomplete
19	Muhammad	8	100	Completed
20	M. Iqbal	8	100	Completed

No	Student Name	Score	Value	Description Completed/ Not Complated
21	Nassya	6	75	Completed Lanjutan
22	Nur	6	75	Completed
23	Raditya	6	75	Completed
24	Rafa	7	87.5	Completed
25	Rany	5	62.5	Completed
26	Rizky MP	3	37.5	Not Completed
27	Rizqy DS	1	12.5	Not Completed
28	Muhamma d	4	50	Not Completed
29	Salsabila	5	62.5	Completed
30	Tristan	4	50	Incomplete
31	Windi	6	75	Completed
32	Yusril	4	50	Not Completed
PercentageComplete				**68.75%**
Percentagelack Tuntasan				**31.25%**
Average				**67.97**

Table 4 Data Analysis

Description	Formula	Calculation	Results
CompleteIndividual	KB = T / Tt X100	KB = 3/8 x 100	37.5
Percentage of classical completeness	P = S 70 x 100 % St	P = 22/32 x 100%	68.75 %
Average	MX= (∑X)/N	X =/32	2.17567 .97

Information:
KB = completeness learning
T = the number of scores obtained by students
Tt = the total score
P = Percentage of completenesscompleteness

Classical learning $\sum S \geq 60 =$ Number of students who scored $\geq 60 \sum$ St Number of students who took the test
MX = average
X = total all student scores

N = Number of subjects/number of students.

Based on the table of learning outcomes and analysis above, there are 22 students or 68.75% who are declared complete, 10 students or 31.25% are declared incomplete. The average reached 67.97 and individual learning completeness showed an increase compared to the results of the Pre-Cycle.

4). Reflection in

Cycle I still found deficiencies that occurred in researchers which resulted in student learning activities that were not good and maximal. The shortcomings in this first cycle, namely:

a) The eacher is still lacking in utilizing time so that a lot of time is wasted
b) In doing apperception, namely linking the past and future subject matter to be studied so that it does not arouse student interest.
c) The teacher does not guide students' activities in learning so that there are still many students who are not active in learning.

Cycle 2

a. Planning

The author re-planned the actions in cycle II with the following steps:

1) Improvement of the learning agenda and tools, preparing learning scenarios, preparing learning media, preparing tools and materials to be used. Especially make the most of your time. This activity is a refinement of cycle I.
2) Provide a more interesting apperception, so that it can arouse and increase student interest.
3) Improve guidance to students, so that students are more active in learning activities.

b. Implementation

An implementation of the action in the classroom is carried out by the author after understanding the planning prepared and perfecting the implementation of the first cycle. The steps for the class action in the second cycle are as follows:

1) Starting the learning by doing apperception in a more interesting way.
2) Delivering basic competencies, achievement indicators, and KKM mathematics.
3) Explain the material for adding fractions.
4) Divide students into study groups that have been formed in cycle I, one group consists of 4 students. Each group was given the task of working on the addition of fractions.
   The test questions are as follows:
   (a) Lani brings a layer cake that has been cut into 10 equal parts. Lani eats 3 pieces, Mama eats 2 pieces. How many pieces of cake did Lani and Mama eat?
   Answer :$\frac{5}{10}$ or $\frac{1}{2}$
   (b) Lani brought one apple which was cut into 8 equal parts. Lani eats 4 pieces, dad eats 2 pieces. How many apples did Lani and Dad eat?
   Answer :$\frac{6}{8}$ or $\frac{3}{4}$
   (c) Before leaving, Mom fried the mpek-mpek. One lenjer cut into 6 parts. Lani ate 2 pieces, Mama also ate 2 pieces. How many pieces of pempek did you eat?
   Answer :$\frac{4}{6}$ *or* $\frac{2}{4}$
   (d) When she is thirsty, Lani drinks a quarter of a bottle of water. Mama then drank a quarter bottle. How much water did Lani and mama drink?
   Answers $\frac{2}{4}$ or $\frac{1}{2}$
   (e) $\frac{2}{8} + \frac{3}{8} = \cdots$
   Answers $\frac{5}{8}$

(f) $\frac{3}{9} + \frac{3}{9} + \frac{3}{9} = \cdots$

Answers $\frac{9}{9}$ or 1

(g) $\frac{2}{8} + \frac{1}{8} + \frac{3}{8} = \cdots$

Answers $\frac{6}{8}$

5) The teacher guides students in take turns in groups.
6) Each group presents the results of their group work.
7) Each group makes important notes and submits questions to the group that is currently the percentage using the discussion method.
8) The teacher draws conclusions from the learning outcomes.
9) The teacher closes the lesson

c. Observations

Observations were made in the learning process by researchers and the results of observations in cycle II, the table of observations of student learning outcomes in cycle 2 is as follows:

Table 5 Learning Outcomes of Cycle 2

No.	**Student Name**	**Score**	**Value**	**Description**
				Completed/ Uncompleted
1	Aditya	6	75	Complete
2	Ahmad		8100	Completed
3	Anggara		8100	Completed
4	Astrid	7	87.5	Completed
5	Aulia		8100	Completed
6	Azril		8100	Completed
7	Dinda	6	75	Completed
8	Fahri	2	25	Not Completed
9	Fajri	7	87.5	Completed
10	Fatiyan	6	75	Completed
11	Galang		8100	Completed
12	Hidayatul	6	75	Completed
13	Khana	5	62.5	Completed
14	Lutviana	7	87.5	Completed
15	M. Rizky	8	100	Completed
16	Maryatul	8	100	Completed
17	Maulana	7	87.5	Completed
18	Melfi	8	100	Completed
19	Muhammad	8	100	Completed
20	M. Iqbal	8	100	Completed
21	Nassya	7	87.5	Completed
22	Nur	6	75	Completed

No.	Student Name	Score	Value	Description Completed/ Uncompleted
23	Raditya	7	87.5	Completed
24	Rafa		8100	Completed
25	Rany	5	62.5	Completed
26	Rizky MP	7	87.5	Completed
27	Rizqy DS	2	25	Not Completed
28	Muhammad	7	87.5	Completed
29	Salsabila		8100	Completed
30	Tristan		8100	Complete
31	Windi	6	75	Tunt as
32	Yusril	4	50	Completeness
	Percentage of			Uncompleted90.63 %
	Percentage of Incompleteness			9.38%
	Average			83.59

Table 6 Calculation of Data Analysis

No	Description	Formula	Calculation	Results
1	Completeness Individual	KB = N/Tt X100	KB = 6 / 8 x 100	75
2	Percentage of completeness classical	P = S 70 x 100 % St	P = 29/32 x 100%	90.63 %
3	Average	MX= (∑X)/N	X = 2.713 /32	83.59

The results of the analysis of the two tables above are 29 students or 90.63% who are declared complete, 2 students or 9.38% are declared incomplete. The average reached 83.59 and individual learning completeness showed an increase compared to the results of Cycle I.

d. Conclusion

Based on the results of the research in the second cycle, it is known that the act of learning by using the direct learning model is good compared to the learning in the first cycle, it is based on the value of student learning outcomes, the average student score and the percentage of completeness. So it can be concluded that by using the direct learning model can improve student learning outcomes.

Based on the results of research data analysis shows that the direct learning model can improve mastery or student learning outcomes. This is based on the table of analysis results as follows:

Table 7 Data Analysis

No	Description	Pre-Cycle	Cycle	
			I	II
1	Number of students who completed ≥ 60	2	22	29
2	Number of students who did not complete < 60	30	10	3
3	Percentage of complete learning	6.25%	68 ,75%	90.63 %
4	Average	32.42	67.97	84.77

The student learning outcomes in the pre-cycle showed a very low percentage, namely 6.25% as many as 2 students. The average value is also very low, which is 32.42. However, in the first cycle, there was an increase in learning outcomes. There are 22 students who have finished studying and 10 students who did not finish. If it is presented as many as 68.75% of students who complete. In cycle II, the results of student learning completeness individually and classically can be said to be satisfactory. This happens because of the 32 students there are 29 students who meet the criteria for mastery learning, while there are 3 students who do not complete. In the second cycle, students' learning completeness was obtained by 90.63% with an average grade of 84.77.

The findings of this study are strengthened by the findings of Rachwardhani (2013) that the use of picture media in the direct learning model can improve student learning outcomes in social studies subjects because the percentage of teacher activity in cycle I gets 68.8%, cycle II gets 84.4% and cycle III gets 92.2%. The percentage of student activity in the first cycle was 62.5%, the second cycle was 76.8% and the third cycle was 89.3%. The percentage of classical completeness of students based on student test results obtained the following explanation: cycle I obtained a percentage of 66.7%, cycle II was 76.7% and cycle III was 86.7%. Likewise, the findings of Rohmatun (2013) that the direct learning model can increase the creativity of the work of drawing shapes. The teacher-centered direct learning model can guarantee student involvement, to develop student learning activities related to aspects of procedural knowledge (knowledge of how to do something) and declarative knowledge (knowledge of something that can be in the form of facts, concepts, principles or generalizations) well structured and can be learned step by step. The direct learning model is very suitable for use in the mathematics learning process, especially units of length. Because in the direct learning model the learning process is mostly directed by the teacher, develops student activities, and is structured.

Hence, the student learning outcomes can be developed properly, in accordance with learning objectives. Diah Ayu Pusfandari (2014) also emphasized that the application of the direct learning model has a positive impact on student activity so that it affects student learning outcomes in Mathematics, so this learning model can be used as an alternative to improve student learning outcomes in the learning process.

CONCLUSION

Based on the findings of the research, it can be concluded that the direct learning model can improve student learning outcomes, especially in mathematics subjects on the subject of fractions at MI Tarbiyatul Athfal Pasir Sakti. Direct learning model is carried out by preparing students to receive lessons, demonstrations, guided training, feedback, and further training (independent). Learning using direct learning models can improve student learning outcomes, this can be seen starting from student learning outcomes in pre-cycle, cycle I and cycle II, namely in pre-cycle 6.25%, cycle I amounted to 68.75%, and cycle II amounted to 90 ,63%. Thus there is an increase in learning outcomes.

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