# THE EFFORTS OF MIXED COUNTING STORY QUESTIONS LEARNING THROUGH CONSTRUCTIVISM APPROACH TO MATHEMATICS SUBJECTS FOR $4^{\rm TH}$ GRADE SDN SARUNI 4

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#### Abstract

This research was motivated by teachers who were not satisfied with the results obtained from mixed counting story problems learning in elementary schools. Therefore, the problem being studied is how the influence of story problems learning using the constructivism approach for 4th grade of SDN Saruni 4. The method used is a qualitative method with classroom action research techniques (action research). The techniques of data collection were carried out using instruments in the form of student worksheets, observation sheets, interview guidelines, field notes, and photo cameras, then the data obtained were analyzed and reflected. This research was conducted in two cycles; each cycle was carried out according to the changes wants to be achieved, as what had been designed in the investigated factors. The skills developed include the ability to solve story problems of addition and subtraction mixed counting operations. The average score of the pre-cycle is 54.71, the first cycle is 71.76, and the second cycle obtains 85.88. Thus, the mastery level of students' concepts about story problems with the constructivism approach has increased generally. Based on the research results obtained, it can be concluded that mixed counting story problems learning through the constructivism approach are successful.

Keywords: Mixed Counting Story Problems; Constructivism Approach

### A. Introduction

The progress of a nation lies in its human resources. With the development of science and technology, as well as the continuous flow of information, transformation, and communication, and the demands for the needs of human life are increasing. Facing such conditions and realities, it is necessary to have better educational services. According to Umayah (2019), the function and purpose of education are to develop the ability, character. and the dignified national civilization in the context of educating the nation's life aims to develop students' potential so they become the human beings who believe and fear of God Almighty, have a noble character, healthy, knowledgeable, talkative, creative, and independent.

According to Utami, et al (2018), mathematics is a science that has an important role in shaping the students' mindset, so they are required to have mathematical abilities to be used as problemsolving tools. As for Sidik's opinion (2016), understanding mathematical concepts are one of the goals of mathematics teaching. Mathematics learning in elementary schools is a vehicle for education to develop all the possessed students' potential which includes reasoning skills, problem-solving skills, creativity, work habits and independence, JPSD Vol. 7 No. 2, September 2021

honesty, discipline, good social attitudes, and various skills needed in social life. Ruseffendi in (Purwaningrum: 2016), argues that "mathematics is important both as the assistive tool, knowledge, mindset guiding, and forming attitudes".

Basically, mathematics is the source of other sciences. So, mathematics is the basis for studying other sciences. Therefore, the mathematics mastery by each student should really be considered, not only knowledge or only in terms of cognitive. In order for mathematics learning to be more meaningful and the objectives of learning mathematics can be achieved, teachers need to pay attention to students' abilities and experiences that students get in life, let children develop their own knowledge under the teacher's guidance. According to Elsinora Mahananingtyas (2018), the teachers use various alternatives in learning such as using several methods and learning models that adapted to the situation and conditions in learning. Students will realize the benefits of mathematics if the mathematics learning process is always associated with students' lives or with problems obtained from students' daily experiences. In other words, mathematics learning should relate the mathematical concepts to real-life situations. So when the teacher instills a concept, the Maspriana & Nunung

students quickly understand it and are able to apply it in their lives. However, the reality in the field does not match the statement above. Many teachers only provide the material or conduct the curricular programs without paying attention to the cultivation of mathematical concepts. Learning is only narrative without the activities that involve students' activities.

Based on the teacher's experience, the problems in mathematics learning include the difficulty of children in solving the problems with stories. This is in line with the opinion of (Suherman, et al, 2002:85), that teachers faced difficulties in teaching how to solve problems properly. On the other hand, the students faced difficulties in how to solve problems given by the teacher because they only focus on the answers. Moreover, the teachers do not develop problem-solving skills which relate to mathematics topics or relate the topics to their daily life or their own experiences. According to Nurul Farida (2015),many difficulties are also experienced by students in solving the problems related to story problems.

Kurnia D, et al (2014), story questions are very useful for the students' thinking processes development because its solution requires completion steps that require understanding and reasoning. Most students have difficulties understanding the concepts

as they are usually taught, that using something abstract and through learning methods. They really need the understanding of a concept related to the place of learning and society in general. It must be realized that the learning program is not just a series of topics/subjects, but should be understood by students and can be used for their lives.

In mathematics, story questions are given to improve students' reasoning abilities in solving problems. Although not every story problem is a problem solver. As stated by Widi Pradini (2019) mathematics story problems are one form of assignment that can be used to determine students' problem solving skills. The importance of story problems given to elementary school students is because the story problems contain information related to students' daily lives. Solving the story problems is not as easy as solving ordinary problems because story problems solving the completion steps. Also, to solve the story problems, you need skills to understand the problems, plan solutions, perform solutions, and review. Throughout the question in the story will form a logical, critical, careful, and creative attitude. As stated by Astuti, et al (2014), that critical thinking skills become an absolute students' necessity this in technological era.

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In mathematics teaching, especially story problems, the questions given to students are in the form of questions. Mathematical problems given can be divided into two types, namely the routine questions and non-routine questions. According to Suherman (2002), routine questions usually include the application of a mathematical procedure that is the same or similar to what has just been learned. Whereas in nonroutine questions, to achieve the correct procedure is needed more in-depth thinking.

Dwidarti U, et al (2019), mathematics story problems are the mathematics problems that are expressed in sentences in the form of stories that need to be translated into mathematical sentences or mathematical equations. In general, the story questions can be used to train students in solving problems. According to Rusdial Marta (2018), the use of approaches in learning affects the learning outcomes obtained, the more precise the approach used, the more maximal the results obtained. As stated by Adriantoni, Altika Syafitri (2019) that to implement the learning process has to use an approach with the hope that the learning outcomes obtained by students are better than the students' learning outcomes that do not use the learning approach. According to Mutiarawati (2019), mathematics learning using the constructivism approach, the teacher's role is JPSD Vol. 7 No. 2, September 2021

not the final answer giver to students' questions but directs them to form (construct) mathematical knowledge, so students acquire a mathematical structure.

In this approach, students are involved in stories they encounter and then translate the words and expressions into mathematical sentences. As the opinion of Supardan (2016) argues that constructivism should encourage students to give open answers and discuss the subject they are studying. In line with Sularmi's opinion (2018)Constructivism theory is a theory that provides activeness for students to learn to find their own competencies, knowledge or technology, and other things needed to develop themselves. To find the story problems' answers, students should first find out what to know and what to ask. Effendi Manalu (2014), the constructivism approach assumes that knowledge is the result of human construction through interactions with objects, phenomena, experiences, and their environment.

In connection with that, the researchers feel the need to research, write, and describe mathematics learning with the constructivism approach to 4th grade elementary school students. Menurut Darna and Isthifa Kemal (2015) Constructivism is an attempt to build a modern cultured life structure. The purpose of this constructivism learning is to explore

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students' knowledge that must be related to the concepts being studied. From this definition, it can be understood that mathematics learning is conducted optimally with the constructivism approach, as part of efforts to improve the quality of education. As the opinion of Artawan G, et al (2017),

application of the constructivism will approach in learning provide opportunities for students to construct the knowledge provided. The application of the constructivism approach provide can opportunities for students during the occurred learning activities.

## B. Research Methodology

This classroom action research was conducted at SDN Saruni 4, Majasari District, Pandeglang Regency. The subjects of this research were 4<sup>th</sup> grade students consist of 15 boys' students and 19 girls' students. Based on the economic background of their parents, most of them are middle to lower economic class. The target of this research is the process of story problems learning using the constructivism approach in 4<sup>th</sup> grade. The classroom action conducted was to divide the students into several small groups, each group consisting of 4-5 students.

According to Sugiyono in (Zerri, Ujang & Mukhtar; 2017), the research method is defined as a scientific way to obtain valid data with the aim that it can be found, developed, and proven, a certain knowledge so that in turn it can be used to understand, solve, and anticipate a problem. This research used the qualitative method with classroom action research techniques.

The form of classroom action research that will be carried out adopts the grouping that the teacher as a researcher has an important characteristic, as the teacher's own role in the classroom action research process. In the form of research, the teachers search for their own problems to solve through the classroom action research, while the outsiders' role is very small in the research process.

The purpose of conducting the classroom action research is to: 1) Improve and perfect the learning practices that should be done by teachers. 2) Improving the teachers' professional services in the teaching and learning process management. 3) Implementation of the in-service training process during the investigation process.

Action research in the classroom is directed to the practitioners' benefit, in this case, the classroom teacher. This means that this school action research can encourage and awaken professionals in this field to

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become aware of themselves to reflect and criticize their professional performance. The implementation of research in the classroom has the following advantages: (1) learning innovation, (2) curriculum development at school and classroom levels, (3) increasing teacher professionalism.

At the planning stage, the teacher as a researcher makes the lesson plans by asking for consideration and guidance from supervisors. The material that will be used is the story questions related to addition, subtraction, multiplication and division with the constructivism approach.

Lesson plans are designed flexibly to accommodate various unexpected influences or things that might occur in the field and limitations that were previously uncontrollable. Planning is also prepared and selected based on the context and consideration the plan that will be implemented effectively in the different field situations. The necessary hook materials, worksheets, questions, observation sheets, interview guides, and field notes used during the action are also discussed in this phase. In this case, the plan is made reflectively so the steps can be more aligned with the goals to be achieved.

The implementation stage of this class is conducted by the teacher himself as a researcher. However, in the observation JPSD Vol. 7 No. 2, September 2021 ISSN 2540-9093

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process, the teacher cooperates with other teachers with the help of various necessary These instruments include tools. the observation guidelines, interview guidelines, and learning outcomes tests. Based on the description of his experience, 4th-grade elementary school students do not yet understand the story problems with the final steps and cannot solve them. As stated by Mc Niff (Suyanto, 1997:7), the main purpose of classroom action research is to improve and increase the professional services of teachers in dealing with the teaching and learning process.

The improvement plan that will be implemented is estimated in three cycles, previously based on the problem's weight as the purpose of this research, considering the condition of students and other processes. The activities conducted in this phase implement the planned learning scenarios. At the implementing stage of this action, the teacher as a researcher is accompanied by an observer to observe the learning activities. Each cycle is conducted in three meetings with the order of the hook material presentation, material presentation of story questions, and practice of questions. Presentation of story problem material emphasizes on understanding the problem, planning for completion, and assessment.

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During this phase, observations were made on the learning process conducted by researchers. The observation sheets are made by the teacher, while the observer is another teacher, the activities of the teacher and students are observed during the learning process. The observer's duty is to observe the accuracy or expertise of the teacher in taking action, whether it is in accordance with the plan or not. Things found in the learning process and not included in the observation sheets are recorded in the notes field.

In this reflection phase, the teacher as a researcher discusses the measurement results with the observer at the end of the measurement. This feedback discussion was conducted carefully and systematically based on the findings of direct field observations to carry out these actions. The results are then reflected, if necessary, to review the previous actions. Moreover, teachers can use the observational data to reflect whether the activities conducted have achieved their goals or not.

According to Sugiyono (2016), the data collection technique is a step that is considered strategic in the research because it has the main goal of obtaining data. The tools used in the data collection of this research consisted of 5 types, namely observation sheets, interview guidelines, field notes, cameras, and test results (student JPSD Vol. 7 No. 2, September 2021

worksheets). Observation in general is the effort to record all events and activities that occur during the action. With this technique, some parts of the research object can be studied directly in real situations. The things studied revolved around everything that happened in the learning process, both what with teachers, happens students, situations. The advantage of this observation is it can provide a detailed experience in realtime. Observations in this action research serve to document the action's effects in relation to the next action as a basis for reflection that will be conducted in the next round of the cycle. The observation guideline is used to collect data on students' learning activities about the story problems through the constructivism approach.

The interview is a conversation that aims to gather or enrich information, that the final results are used for qualitative analysis. Interviews were conducted by asking several questions to randomly selected students. Interviews were conducted with students in order to obtain information on the mathematics learning implementation after implementing the measurement.

In principle, the data processing and analysis is conducted throughout the investigation continuously from the beginning to the end of the action program's implementation. After collecting data from Maspriana & Nunung

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various research tools, the data is filtered and drawn the conclusions. To achieve this, several steps need to be taken, as follows:

After data collection, the representative data are selected that can respond to the research focus and provide an overview of the research results. Data classification is data grouping that has been selected by

classifying data according to its purpose to facilitate data processing and decision-making based on percentages that are used as the guidelines. After the data is classified according to the investigation purpose, tabulate with the tabulation of frequency of each alternative response which will also make the data easier to read.

#### C. Result and Discussion

Before the research was conducted, the learning used by the teacher was still conventional, which only used the lecture method, question and answer, and assignments. Students are not given the freedom to try using their own way because they are fixated on the examples given by the teacher, so the learning is less interesting.

Generally, in solving story problems, students immediately write down the results without any prior process, such as understanding the problem, planning, and solving problems. From this, it is clear that the students' ability to solve the story problems is very low. Based on the test scores obtained by students, the general description of the mastery level of the material in the action of the first cycle 1,

with the average class score that can be achieved by 54.71 (29.41%).

The learnings action in the first cycle related to story problems involves multiplication and addition. The first cycle's learning is still closely related to the learning actions in the previous cycle. Therefore, the findings and reflections from Pre-cycle learning can be taken into consideration. The students' main activity is solving story questions on the worksheets. The description of the activities is presented in a shorter way because in many cases it repeats the previous cycle. Although not exactly as scheduled, the time used in the first cycle is relatively more effective than the previous action. It means that the teacher's ability to streamline the learning time continues to progress. The achieved test results in the first cycle with a

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maximum score of 100, where the lowest score obtained is 40 and the highest is 100, from all the scores then divided by 4. Thus, the mastery level of the story questions concept, in general, has increased.

The learning activities conducted in the second cycle are not much different from the activities in the previous actions. The teacher's actions are focused on forming students' understanding at the planning stage because at this planning stage there are still some students who still do not understand it.

The next activity conducted by the teacher is asking students to work on the worksheets questions provided by the teacher. The teacher goes around to each group while guiding students who are still having difficulties or who do not understand the story questions in the worksheets. The worksheets results contain the story questions of 4 groups, there is only 1 group that answers all correctly. And the other three groups are still incomplete, especially in understanding the mathematical sentences.

The steps in solving the story problems, in general, can be understood by students and can be implemented properly. The use of the constructivism approach to the story problems given by the teacher can actually increase students' learning enthusiasm and they feel happy because the learning is related to everyday experiences in real life. Besides that, the student's ability in the learning process also increases. This can be seen when students work on the evaluation questions, which are given by the teacher in more detail and thoroughness.

The achieved results by 34 students, there were 12 students who answered all correctly with a score of 100, 20 students obtain a score of 80, and 2 students obtain a score of 60, with an average score of 85.88. Based on these scores, gives illustrates that after conducting story questions learning through the constructivism approach, there is an increase in students' learning outcomes.

The following is the overall of average score and completeness of each cycle shown in tables and diagram below:

Table 1. The Average Score and Completeness of Each Cycle

No	Students' Name	L/P	Assessment		
			Pre-Cycle	Cycle I	Cycle II
1	Agil Ardiyansah	L	40	80	80
2	Ahmad Mufasir	L	80	100	100
3	Alfi Rahma Oktavia	P	40	60	80
4	Amara Maulida	P	40	60	80
5	Andes	L	40	60	80
6	Angga Maulana	L	80	100	100

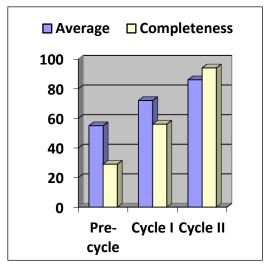
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7	Anis Khoerunisa	P	60	80	80
8	Anisa Adelia Putri	P	60	80	80
9	Ependi	L	80	80	100
10	Fitri Purwati	P	80	80	100
11	Galang Pirmansyah	L	40	40	60
12	Gibran Syaelindra	L	40	60	80
13	Haikal Riziq	L	80	100	100
14	Hervi Yani	P	40	80	80
15	Hesti Rahayu	P	40	80	100
16	Ilham Sucipto	L	80	80	100
17	Indah Nuraeni	P	40	40	60
18	Irma Erviana	P	40	80	80
19	Jihan	P	40	40	80
20	M. Faiz Aryadilah	L	40	60	80
21	M. Hudri	L	80	100	100
22	M. Vijay Hendrawan	L	40	60	80
23	Moh. Aldan	L	40	40	80
24	Perdiansyah	L	80	80	100
25	Ratu Nufa	P	60	80	80
26	Revan Al Pauji	L	40	60	80
27	Sihrotu Sita	P	40	60	80
28	Siti Nasya Aryani	P	80	80	100
29	Siti Nurkamilah	P	60	60	80
30	Siti Nurrahmah	P	40	60	80
31	Sofy Shadana	P	40	80	100
32	Syifa Septi Andira	P	40	60	80
33	Yulistiani	P	80	100	100
34	Yuniar Dwi Prasetyo	P	60	80	80
Total			1860	2440	2920
Average			54.71	71.76	85.88



Picture 1. The Average Score and Completeness of Each Cycle

The material presented is a story problem involving addition, subtraction, and a mixture of addition and subtraction. The material presentation related to each action by building students' initial conceptions associated with experiences in students' daily lives. The completion stage of each question through constructivism is the stage of disclosing students' initial knowledge, namely the exploration stage, the concept's discussion and explanation stage, and the concept's development and application stage, the activities conducted in groups, group representatives are able to present in front of the class.

The average score achieved in the group activities of each action in the Precycle is 54.71 (29.41%). By observing the pre-cycle learning activities conducted by the teacher, it appears that there is an

improvement in the pattern of teacher-student, student-student, and student-teacher interaction going well. Thus, the communication between groups, questions and answers, and collaboration are obtained from students' experiences in learning by applying the constructivism approach. The learning series with the constructivism approach and teacher reflection on students had resulted in changes in the students themselves.

The material presented is a story problem involving multiplication of addition and multiplication of subtraction followed by evaluation. The hook material presentation is done through the questions taken from students' everyday problems. The activities conducted in groups and group are representatives are able to present in front of the class. The results achieved by students in the class average increased from the precycle of 54.71 to the first cycle of 71.76 (55.88%). It is a quite good improvement, although not so much improvement.

By looking at the learning series conducted by the teacher, it appears that there is improvement in the teacher's ability in conditioning the class. This is shown by the reflective and creative attitude of the teacher in creating better learning conditions so the skills and activities of students increase. The most prominent teacher's Maspriana & Nunung

action to optimize mathematics learning with the constructivism approach is an effort to increase students' social interaction in group discussion activities.

The presented material is a story problem that involves the division of addition and division of subtraction and ends with an evaluation. The hook material presentation is taken from students' daily experiences, then students practice solving problems with the teacher's guidance. Based on the scores obtained by students, the general description of the material's mastery level in the second cycle of the average class is 85.88 (94.12%) increased from the first cycle which only obtained the average of 71.76. These scores illustrate that after the problems learning through the story constructivism approach, there is an increase in students' learning outcomes. Based on the

research results conducted by the author, obtain that there was an increase in students' learning activities and students' learning outcomes towards the story problems learning activities by applying constructivism approach. As the results of Andriantoni's research (2019),the constructivism approach is one of the learning approaches that can affect students' learning outcomes. This can be seen from the hypothesis testing results using the t-test. From the calculation results, obtain that H0 is rejected because  $t^{count} = 1.9252$  is greater than  $t^{\text{table}} = 1.696$ . So it can be concluded that H0 is rejected and H1 accepted, in other words, "there is the effect of the use of the constructivism approach on science learning outcomes in 5th grade of SDN 33 Kalumbuk, Padang City".

### **D.** Conclusion

With the background of mathematics learning activities in 4th grade, everyday teachers tend to teach directly procedurally without paying attention to the process. This raises the problem that students do not understand the taught concepts. This situation shows that the teacher explains the material abstractly, only from textbooks, and does not relate the learning to the everyday experiences of students. Starting from the JPSD Vol. 7 No. 2, September 2021

students' problems and difficulties as problems that need to be solved, it is necessary to study how the teachers' efforts to improve students' conceptual understanding in mathematics learning, especially story problems in elementary school.

One of the efforts that teachers can do in improving students' conceptualization of mathematics learning in elementary school is

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by creating effective learning. Whereby using the constructivism approach mathematics learning, can help to improve students' conceptual understanding because, with this constructivism approach, students explore their own experiences. can Therefore, the research has been conducted to improve the conceptual understanding of mathematics learning through the use of the constructivism approach. In this research, the action is conducted, after conducting the action, the results are analyzed and reflected. After discussing the data, it can be concluded that by using the constructivism approach it turns out that students have succeeded in

changing their attitudes. The students who were initially less enthusiastic and insensitive enthusiastic became and in confident their work. Using the constructivism approach, you can help students to understand the concepts being taught. Because this approach combines learning with students' everyday experiences, students become active and make their memories permanent and persistent to facilitate the understanding of the concepts. The use of the constructivism approach of story problems in mathematics subjects increases students' activities, so it can encourage higher learning achievement.

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