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## Implementation of Collaborative Learning Type Send-A-Problem viewed from Responsibility and Problem Solving Ability Mathematics of Elementary School Students

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**Abstract.** Collaborative learning model is a learning model that is purposely designed and implemented in pairs or in small groups. All members of the group without exception are required to be active in the group. The aim of this research is to know the influence of responsibility attitude through the model of collaborative learning type send-a-problem to the ability of problem solving of mathematics and to know whether problem solving ability of student math through model of collaborative learning type send-a-problem can fulfill KKM. The research was conducted at SDN 8 Tulakan Jepara. The sample of the research in the class V students with random sampling technique. Techniques of data retrieval using test and nontes techniques in the form of a questionnaire. Based on the results of research data obtained from the test of hypothesis I that is with simple linear regression test that is with regression equation  $y = 1,629 + 0,593 x$  which means every addition of one unit of independent variable will result in increase of dependent variable equal to 0,593. Student's problem solving ability also fulfill KKM, it can be seen from the average of students' mathematic value using model of collaborative learning type send-a-problem that is 73,7. Hypothesis II test result that is also by using t test obtained ttable with  $t_{table} = t_{\alpha} (dk = n-1)$  with significance level 0,05 hence obtained result  $t_{table} = 1,717$  with  $t_{count} = 2,681$ . So it can be concluded the problem solving ability of student math through model of collaborative learning type send-a-problem minimum 60 ( $\mu \geq 60$ ) or can fulfill KKM.

### INTRODUCTION

Education plays an important role in human life. With human education can develop the potential and insight he has as a provision in living this life and the future. The quality of human resources can increase through education. The importance of education so that the government always improves the quality of education in Indonesia so that education in Indonesia can develop its potential in realizing human beings who have religious spiritual strength, self-control, personality, intelligence, noble character, and the skills needed by themselves, society, nation and state through learning atmosphere and active and independent learning process. Education greatly influences the advancement of a nation because through education can make human beings competent and civilized. Education can print quality citizens.

Education has a level or level that is always increasing. This level of education affects every human behavior. Elementary school is a very influential level of education because students study in elementary school for six years. Elementary school is the first step for students to find their identity and character formation. In the process of developing identity and character formation, it cannot be separated from the learning process.

The role of the teacher In learning elementary school is very complex in helping, guiding, and directing students during the learning process. So that a teacher is needed at the level of primary education because elementary school students still need teacher involvement in learning so that the material delivered can be well received and understood by students and can achieve the learning objectives that have been set.

In elementary school there are several subjects, namely a number of subjects that must be taken by students in a certain period of time such as Civics, Indonesian Language, Mathematics, Science and Social Sciences. These five subjects are the essence of the elementary school education unit level curriculum where the five subjects have scope. One subject that becomes a curriculum as a subject at the elementary school level is mathematics. Mathematics is a knowledge of quantity and space, one of the branches of many branches of science that are systematic, organized and exact. Mathematics is numbers and calculations that are part of human life. Mathematics is the queen of science. Therefore mathematics is one of the compulsory subjects that students must understand so students can develop their thinking power.

Mathematics lessons are compulsory lessons taught in elementary school. But of course in teaching mathematics in elementary school is not as easy as what we imagine, other than students whose mindset is still in the concrete operational phase, also the ability of students is very diverse. According to Heruman (2007: 3), in mathematics, every abstract concept that is newly understood by students needs to be immediately given reinforcement, so that it settles and lasts for a long time in students' memory, so that it will be embedded in their mindset and action patterns. For this purpose, it is necessary to learn through action and understanding, not just memorizing or remembering facts, so that students really master mathematical concepts and can solve mathematical problems.

For this reason, educators are required to be able to create a new teaching strategy that can help students learn and master the material taught starting from the selection of models and methods. Learning model is a step in achieving learning goals. The stimulus of the learning model will influence the positive learning response of students. The learning model is very important to use when the teaching and learning process occurs.

Educators must be able to apply learning models to provide an effective, active and enjoyable learning. But unfortunately, there are still many educators who do not apply the appropriate models and methods in learning. The learning used is still teacher-centered. Whereas according to Ulia, N (2016) states that teacher centered learning where learning takes place is unidirectional will make students always depend on the teacher's work. In addition, there are still many educators who

prefer to use the lecture method to deliver material and students are asked to study individually. In fact, not all subjects will be effectively absorbed by students if they only use the lecture method and apply individual learning. For example in Mathematics, an elementary school student will not absorb material effectively and have difficulty solving problems if he only listens to the teacher's explanation. Instead the teacher must design a model that can require students to practice solving problems. There are also those who have used the learning model by forming cooperative learning groups or models.

In cooperative learning students are usually asked to work on tasks that are done in groups. However, group learning is also felt to be inefficient if there are students in the group who are not responsible for doing their work and only rely on friends in the group. So, we need a collaborative learning model which contains positive interdependence among students to achieve learning goals and achieve equal opportunities to be able to and succeed together. As according to Piaget about collaborative learning with the concept "active learning" argues that students learn better if they think in groups. Piaget also believes that if a group is active, the group will involve others to think together, so that learning is more interesting (Smith, B.L. and Mac Gregor, in Raharjo 2013).

The collaborative learning process can require students to be actively involved, both mentally and physically and socially. This kind of learning process provides more opportunities for students to succeed in mastering basic competencies. Collaborative learning can be applied to all subjects including Mathematics. With collaborative learning will require students to be responsible for working on tasks that become a burden in the group so that it will hone students' mathematical problem-solving skills.

Based on the results of interviews with the fifth grade teacher of SDN 8 Tulakan Jepara stated that mathematics is a student's preferred lesson less than other lessons. In following mathematics learning, some enthusiastic students and others lack attention when asked to listen to the explanation of the material from the teacher. Mathematical material that is lacking is controlled by fifth grade students of SDN 8 Tulakan Jepara, namely in fraction material. In the material there are still many grades of students who have not fulfilled the KKM as many as 16 students from 33 students or as much as 48.48% while the KKM for mathematics

subjects is 60. Students' problem solving ability is still low and still difficult. As the opinion of Ulia, N and Lestari, D (2017) that solving a problem is an activity which at the age of elementary school students in cognitive development is still bound by concrete objects, then in this problem solving ability is still considered difficult learning for elementary students. The ability of fifth grade students of SDN 8 Tulakan Jepara to solve mathematical problems is not good, especially in fractions. In fractional material, students experience difficulties in the concept of operating fractions such as addition, subtraction, multiplication and division. Students will also be more confused when encountering fraction problems in the form of story problems. Some students do not understand the problem in story problems. When asked to be in groups some students take part in group activities well but there are some students who do not participate in problem solving and only rely on their friends. So it can be said that some students do not have a good attitude of responsibility. Another problem that occurs when learning mathematics is the repetition of material that many students feel do not understand so wasteful of time or miss material. For this reason the teacher manages it by giving extra hours of study after school. but it is also not fun for some students who already understand the material, they tend to be bored and bored with the repetition of the material. The results of the interview with the teacher were synchronized with the results of interviews with fifth grade students of SDN 8 Tulakan Jepara, most students did not like mathematics because it was considered difficult and made saturated by counting the numbers.

From the interview results above mentioned that the ability of students in solving mathematical problems is less good, especially in math story matter, some students do not understand the problem in the story matter. Whereas according to BSNP in Adelia, W. S (2017: 2) states that one of the objectives of mathematics learning is so that students have problem-solving abilities that include the ability to understand problems, design mathematical models, complete models and interpret solutions obtained. The goal is to put problem solving into an important mathematics curriculum. In the process of learning and problem solving, students can gain experience using the knowledge and skills they already have. It is this experience that then trains students' thinking power to be logical, analytical, systematic, critical, and creative in dealing with problems. Through

problem solving exercises, students will learn to organize their abilities in developing appropriate strategies to solve problems. Problem solving encourages students to approach authentic, real-world problems in a systematic way (Jacobsen, Eggen, and Kauchak, in Adelia, W. S 2017: 19). Problem solving skills can be seen as one of the learning processes and outcomes.

From the observations at SDN 8 Tulakan Jepara also showed a problem in addition to students' mathematical problem solving abilities which were still not good, namely students did not have a good attitude of responsibility, this was evident when students were asked to group there were some students who did not submit proposals in solving problem, don't do the work in groups and just keep on relying on friends. According to Yaumi (2014: 83), a student is said to have a good sense of responsibility when carrying out his duties and obligations that he should do to himself, his community, and his environment. Whereas according to Daryanto et al (2013: 142) attitude indicators responsibilities include making reports of each activity carried out, carrying out tasks without being told, avoiding cheating in carrying out tasks, and proposing a problem solving proposal. So it can be said that a student who did not participate in solving the problem or did not take part in the task in the group and did not do the task from the teacher if not told many times, the student does not have a good attitude of responsibility.

For this reason, an appropriate learning model is needed for learning mathematics in elementary schools that emphasizes or encourages students to truly understand the problem and know how to solve the problem properly so that all students really understand and there is no reason to rely on their friends when given assignment by the teacher. One such learning model is the Collaborative Learning model of the Send-A-Problem Type.

Collaborative learning or collaborative learning models are learning models that are intentionally designed and implemented in pairs or in small groups. The concept of collaborative learning according to Gokhale, AA (1995) "The concept of collaborative learning, the grouping and pairing of students for the purpose of academic achievement, has been widely researched and advocated throughout the professional literature" which means that the concept of collaborative learning, is a learning by grouping or pairing students for the purpose of achieving the learning

objectives that are based on professional literature studies.

In collaborative learning, teachers deliberately design the design of learning activities for students. All group members without exception are required to be active in the group. Barkley, E et al (2012: 5) states that in collaborative learning all group members must play a role in achieving their intended goals. If there is only one person who completes group assignments while the other members only see, this method cannot be called collaborative learning. All members must have equal contributions, both when they do the same task or when they do different tasks. When collaborative learning is carried out there will be a meaningful learning process. When students group together in a collaborative task, they must be able to obtain knowledge or understand more material so that learning objectives can be achieved. As stated by Bruffee, K. A. (1995) "two heads are better than one head" this means that collaborative learning will be easier to solve problems because the thinking of two or more people will produce better thoughts than one person's thinking.

Collaborative learning can also make classrooms live by small groups so that it is interesting, not boring and effective. There are several categories in collaborative learning namely discussion, reciprocal teaching by friends, solving problems, managing information and writing. This category is used to classify models that correspond to each category. Research that will be conducted by researchers through collaborative learning related to students' mathematical problem solving skills, including in the category of problem solving, so the researcher chooses one model in that category, namely the Collaborative Learning model of Send-A-Problem Type. Collaborative Learning Model Type Send-A-Problem is a learning model where students try to solve a problem in groups, then continue the problem and the solution to the closest group who then do the same thing; the last group will evaluate the solution. So each group member is required to work on or evaluate the results of his friend's solution. With the implementation of the Collaborative Learning model the Send-A-Problem Type is also expected to foster the attitude of the responsibility of students with the burden of each student's work that must be done alone.

In this study, the Collaborative Learning model of the Send-A-Problem type will be applied to the mathematics learning of class V fractions. Because from the results of

interviews with class teachers that have been described above, there is material that is poorly understood by fifth grade students of SDN 8 Tulakan Jepara, one of which is fractions. Fractional material itself is material that must be discussed in class V elementary school. In the fraction material, we will discuss how to change various forms of fractions, addition and subtraction of fractions, multiplication and division of fractions and daily problems related to fraction count operations. Some students do not understand the concept of fractional counting operations and confusion over solving fraction problems in the form of story problems so that sometimes students are lazy to solve problems. So, with the implementation of the Collaborative Learning model of the Send-A-Problem type, students are expected to truly understand the concept of fractional counting operations and kneel to learn to solve the problems they receive. Students don't just listen to the teacher's explanation or joke with their friends. But continue to try to find solutions and solve the problems that are received, so that students really understand the problem, determine the strategy and are able to solve problems properly. With the implementation of the Collaborative Learning model, the Send-A-Problem type is also expected to be more responsible for the students' duties and obligations because in collaborative learning requires all students to play a role in achieving the intended goals.

The formulation of the problem in this study is whether there is an influence attitude attitude through the Collaborative Learning model of the Send-A-Problem type on the mathematical problem solving ability of the fraction of the fifth grade students of SDN 8 Tulakan Jepara, and Is by using the Collaborative Learning Model Send-A Type - problem of the level of mathematical problem-solving ability of materials in the fifth grade students of SDN 8 Tulakan Jepara can meet the KKM?

## METHOD

The purpose of this study was to determine the influence of the attitude of responsibility through the Collaborative Learning model of the Send-A-Problem type on the mathematical problem-solving ability of grade V SDN 8 Tulakan Jepara and to determine whether the mathematical problem-solving ability through the Collaborative Learning model of Send-A-type Problems can meet the KKM. The time of the research was

held from January to March 2018 in the even semester. In the implementation of the study there were several activities such as observation and interviews, instrument testing, fractional material learning using collaborative models, and data retrieval. This research was conducted in class V SDN 8 Tulakan selection of places because based on initial observations had the characteristics expected by researchers. In this study the approach method that will be used is quantitative experimental research.

In this study there are also two variables, namely the independent variable and the dependent variable, where the role of independent variables is a cause and dependent is the result of independent action. Experimental research is a research that is useful to find an influence from an action or treatment on something that produces a certain effect. Experimental research methods are defined as research methods used to achieve certain treatment effects on others under controlled conditions. In order to know how much influence a treatment has on an experimental study, before that we must know the results before applying a treatment in the case of this study, namely the implementation of the Collaborative Learning Type Send-A-Problem model which requires maximizing the attitude of student responsibility, after the results are known. knowing how the influence of the attitude of responsibility towards students' mathematical problem-solving skills is done by implementing the Collaborative Learning Type Send-A-Problem during learning, after that it is measured using research instruments.

The research design used in this study is Pre-Experimental Design. It is said Pre-Experimental Design, because this design is not yet a serious experiment. Because there are still external variables that influence the formation of the dependent variable. So the experimental results which are dependent variables are not solely influenced by independent variables. This can occur because of the absence of a control variable, and the sample is not chosen randomly. Because the object in this study was only one class, researchers used the One-Shot Case Study design that there was a group given treatment / treatment, and then the results were observed. (treatment is as an independent variable, and the result is the dependent variable).

In this study the population to be studied is class V SDN 8 Tulakan totaling 33 students. The population that will be used is the fifth grade students totaling 33 students consisting of 18 men and 15 women. The

sampling technique is a sampling technique. This study uses Propability Sampling sampling technique. Probability Sampling is a sampling technique that provides equal opportunities for each element (member) of the population to be chosen as a member of the sample. This technique covers several types, and the one used in this research is Simple Random Sampling. Because using Simple Random Sampling, researchers randomly sampled as many as 23 of 33 students by taking 10 rolls of student absent numbers which were not sampled.

In the study will require data to be used as a reference, data collection techniques used are observation, interviews, documentation, questionnaires and tests. The analysis of research data consists of analysis of instrument testing, initial data analysis and final data analysis. Instrument test analysis consists of different power test questions, test the level of difficulty of the problem, reliability test, and validity test. These tests use the Excel and SPSS applications. While the analysis of the initial data comes from the daily test data of mathematics subjects. Initial data analysis includes data normality testing. Whereas the final data analysis consisted of data normality test, regression test and completeness test using one sample t test.

## RESULT AND DISSCUSSION

The description of the acquisition value of the mathematics problem solving ability test results using the Collaborative Learning model of the Send-A-Problem type at SDN 8 Tulakan can be concluded that the average result of the class is 73.7 which means that the class can be said to have gotten the average value above the minimum completeness criteria limit, and obtained the minimum value or the smallest value of the class is 25, the maximum value or the highest value of the class is 100. With completeness as much as 69.6% of the sample and not complete as much as 30.4% of the sample with KKM value 60 can be concluded that students who get scores below the KKM are relatively small compared to students who get scores above the KKM, showing students' mathematical problem solving skills are fairly satisfying.

Based on the results of the attitude questionnaire responsibility that has been filled by students during learning can be concluded that the average attitude attitude questionnaire of class V SDN 8 Tulakan is 77.

There is the smallest value of 53.3 and the highest value is with the acquisition of a score of 100. Can It was concluded that the attitude of students' responsibility towards learning was average, where it was seen from the number of students who received good scores more dominant than students who scored enough and less, thus this was a proof that the attitude of responsibility applied through Collaborative Learning models of the Send-A-Problem type have been successful.

The initial data analysis was used to determine whether the data was normal or not, in the initial data analysis researchers used the parametric statistical normality test to determine whether the data distribution was normal or not, in this study researchers tested data leaflets with 23 samples of data, researchers used work programs Ms.Excel to find out the normality of the data that has been obtained. From the calculation results obtained  $L_{maks} = 0.125$  and  $L_{tabel} = L_{0.05} (23-1) = L_{0.05} (22) = 0.189$ . Because  $L_{maks} < L_{tabel}$ , the data comes from a population that is normally distributed.

Based on the regression test obtained the regression equation  $y = 1.6294 + 0.593 x$ . Which means that every addition of one independent variable unit will result in an increase in the dependent variable of 0.593. So it can be concluded that there is an influence of the attitude of responsibility towards the mathematical problem solving ability of the fifth grade students of SDN 8 Tulakan. The completeness test is used to find the student's completeness. From the calculation of the average amount of students' mathematical problem solving ability through the Collaborative Learning model the Send-A-Problem type is 73.7.

Testing on the next hypothesis using the t-test shows  $L_{max} < L_{tabel}$ , it can be concluded that the final data distribution is normal. After testing the normality of the data distribution and have determined the hypothesis to be tested, the next step is to determine the value of the tax and table. The results of the t test calculation obtained by t table with  $t_{table} = t_{\alpha} (dk = n-1)$  with a significance level of 0.05, the results obtained were  $t_{table} = 1.7171$  with t count = 2.681. So it can be concluded that students' mathematical problem-solving ability through the Collaborative Learning model of Send-A-Problem Type is at least 60 ( $\mu \geq 60$ ) or can meet the KKM.

Based on the results of the study which states that there is an influence attitude attitude through the Collaborative Learning model Type Send-A-Problem on mathematical

problem solving ability because Collaborative Learning Model or collaborative learning is a learning model that is deliberately designed and implemented in pairs or in small groups. All group members without exception are required to be active in the group. Collaborative learning of all group members must play a role in achieving the stated goals. If there was only one person who completed group assignments while the other members only saw, then it could not be called collaborative learning. All members must have equal contributions, both when they do the same task or when they do different tasks. So, in this collaborative learning, all group members have a task burden that is the responsibility of each that must be done so that it is expected to influence students' mathematical problem solving abilities. The Collaborative Learning model used by researchers is a Collaborative Learning Model of the Send-A-Problem Type. Collaborative Learning Model Type Send-A-Problem is a learning model where students try to solve a problem in groups, then continue the problem and the solution to the closest group who then do the same thing; the last group will evaluate the solution. So each group member is required to work on and evaluate the results of his friend's solution.

There is influence after the implementation of the Collaborative Learning Type Send-A-Problem model that demands the attitude of student responsibility. The influence is shown during the implementation of learning with the responsibility of students to solve the problems they receive so that students also really understand the material. This is evidenced by the results of a questionnaire that shows a good score obtained by students with an average value obtained by students is 77, the percentage of the acquisition of responsibility indicators can be seen in the following table.

Table Percentage of Indicator Responsibility

No	Indicator	Prosentase
1	Take an active role in classroom and school activities	79,35 %
2	Doing tasks without being told	74,78%
3	Demonstrate initiatives to solve problems and propose solutions to problems	76,96 %
4	Avoid cheating in carrying out tasks	76,23 %

5	Make a report of each activity carried out in oral or written form.	72,61 %
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Based on the data above, it can be interpreted that there is a satisfactory success in achieving the indicator of responsibility. This is indicated by the presentation of the value of each indicator reaching more than 70%, so that it can be concluded that the attitude of responsibility of each student can influence the ability of mathematical problem solving and indicators are worthy of being given by students in order to support the learning process in the fifth grade mathematics learning 8 Tulakan.

Besides can be proven from the attitude of responsibility obtained very good the influence between attitudes of responsibility and problem solving ability can also be proven through the results of the test scores obtained by students, where the results of the student test scores obtained are very good, meaning the influence of attitudes of responsibility through the Collaborative model The Learning Type Send-A-problem synergizes with problem solving abilities where the achievement of the value of problem solving abilities also get a good value that is with an average score of 73.7.

Based on the data above shows that there is real evidence of a positive influence on the attitude of responsibility through the Collaborative Learning model of the Send-A-Problem type on the mathematical problem-solving ability of students of SDN 8 Tulakan. After obtaining a positive influence on the attitude of responsibility towards mathematical problem solving ability, in order to answer the second problem, is whether the students' mathematical problem solving abilities can fulfill the KKM using a sample t test, the test is used whether the student has reached the minimum completeness criteria. The results of the t test calculation obtained by t table with  $t_{table} = t_{\alpha} (dk = n-1)$  with a significance level of 0.05, the results obtained were  $t_{table} = 1.717$  with  $t_{count} = 2.681$ . So it can be concluded that students' mathematical problem solving ability through the Collaborative Learning model of Send-A-Problem Type is at least 60 ( $\mu \geq 60$ ) or can meet the KKM.

According to research from Khumaidah, A. N. (2017) states that Collaborative Learning model learning is effective on students' mathematical problem solving skills in mathematics learning seen in the results of student responses in the cognitive domain achieving an average value

of 80 which is better than conventional learning. This means that collaborative learning models are more influential than conventional learning models. This is also reinforced from research conducted by Indiyani, N. E., & Listiara, A. (2006) which states that Collaborative Learning can reduce students' anxiety in dealing with mathematics learning.

The results of the study are also supported by the existence of learning theory and also applied in learning, as according to Piaget about collaborative learning with the concept "active learning" argues that students learn better if they think in groups. Piaget also believes that if a group is active, the group will involve others to think together, so that learning is more interesting. The collaborative learning process can require students to be actively involved, both mentally and physically and socially.

This is because in collaborative learning there is an interaction between the teacher, students and the environment which is in accordance with Vygotsky's theory in Widjajanti, DB (2008) which states that the importance of social interaction to help students gain a higher level of understanding through learning with the help of teachers and friend.

Of the several relevant studies that have been described, it can be concluded that there is an influence of a significant attitude of responsibility in a learning where the influence is positive which will have a positive impact on students' mathematical problem solving skills so that they can meet the KKM.

### CONCLUSION

Based on the results of the research and discussion, it was concluded that there was an influence of the attitude of responsibility through the Collaborative Learning model of the Send-A-Problem type on the mathematical problem solving ability of the fraction of the fifth grade students of SDN 8 Tulakan. From the calculation, the effect is 0.527. And the ability to solve students' mathematical problems through the Collaborative Learning model of the Send-A-Problem type can meet the KKM. That is, with an average value of 73.7.

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