IRJE |Indonesian Research Journal in Education|
|Vol. 7| No. 2|Dec|Year 2023|

The Impacts of the Inquiry Learning Model and Learning Motivation on Fraction Problem-Solving Ability in Elementary Schools

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Abstract

This research was quasi-experimental with a population of fourth-grade students at *SD Negeri 06 Lasi Mudo* and *SD Negeri 08 Kubang Duo*, *Canduang* District. Research data was obtained from test results and questionnaires. In addition, data analysis indicated a significant difference in the ability to solve Fraction problems between the inquiry and conventional models. The results of data analysis using the two-way ANOVA test obtained a sig value of 0.04 < 0.05 indicated a significant difference in learning outcomes between the inquiry and conventional models in learning motivation, but for low motivation, the sig. of 0.746>0.05 concluded that there was no significant influence between the inquiry model and learning motivation. The test results of learning models and learning motivation on Fraction problem-solving abilities through the two-way ANOVA test obtained an f-count of 3.123 with an F-table of 4.034. It showed no interaction happened between inquiry, conventional learning models, and learning motivation in Fraction problem-solving abilities in elementary schools.

Keywords
Elementary school, Fraction, inquiry learning, motivation, problem-solving

Article History
Received 01 August 2023
Accepted 04 November 2023

How to Cite
Marni, Y., Hadiyanto., Ahmad, S., & Zaini. M. (2023). The impacts of the inquiry learning model and learning motivation on Fraction problem-solving in elementary schools. *Indonesian Research Journal in Education |IRJE|*, *7*(2), 545 – 560. https://doi.org/10.22437/irje.v7i2.31603

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Introduction

Mathematics is a subject that requires students to have a strong understanding of the concepts. This process requires ability in mathematical problem-solving skills, which are considered the heart of learning. For this reason, students not only learn concepts but also emphasize the development of students' thinking skills and methods. According to Thompson (2013), students must be able to build new mathematical knowledge through problem-solving so they can turn this learning into a learning experience. Gagne (1980) stated that problem-solving is the highest and most complex type of learning compared to other learning types. Problem-solving is not only to help students develop thinking skills but also to develop basic skills in solving problems both in learning and everyday life. English and Gainsburg (2015) also explained that Mathematics problem-solving is related to the solving mathematical problems process, or everyday problems by applying and adapting various effective strategies. This process also includes the construction and reconstruction of mathematical understanding through problem-solving. Some other researchers also consider problem-solving as the highest type of learning because it responds not only to past associations and conditioning but also relies on the ability to manipulate abstract ideas, use small aspects and changes, and project oneself into the future. It is appropriate for students to be guided through a learning process that uses methods, procedures, and strategies to develop fundamental abilities in learning Mathematics itself. Ahmad et al. (2014) emphasized that solving problems can be like creating new ideas and introducing new techniques or products. Roebyanto (2018) also explained that problem-solving is a planned process that needs to be implemented to achieve an intuitive solution to a problem that may not be possible through planning. Problem-solving is considered a way to find a way out of a problem.

According to Lyle and Robinson (2001), solving a problem requires a combination of fundamental knowledge (base knowledge) and basic skills (base skills). Basic knowledge is a collection of knowledge stored in a person's long-term memory as a result of what that person has learned. Basic skills in solving problems include several things, including problem analysis skills, skills in linking relevant concepts to problems, and skills in planning appropriate alternative solutions. In problem-solving, there are skills that students must master regarding problems faced in everyday life and the ability to balance themselves. According to Kool and Keijzer (2018), there are two groups of problems in Mathematics learning: routine problems and non-routine problems. The same thing was conveyed by Gillies and Khan (2008), that the tasks of teachers in helping students complete problem-solving are (1) teachers must know that the balance of thinking of the students is sufficient and they have knowledge of the prerequisites and intuition in solving problem-solving, (2) assisting students looking for how to complete the questions, (3) monitor students as they complete the questions, (4) paying attention to students in reviewing answers, methods, solutions, etc., which have been done intuitively, looking for better ways, avoiding mistakes, etc.

Based on phenomena in the field based on the results of observations and interviews that the researchers conducted on July 22 and 27, 2023 at core elementary school, which consists of 6 elementary schools in the KKG Gugus II activities, *Canduang* District, Agam

Regency, West Sumatra, with several teachers and also interviews with several students, students' ability to solve problems, especially in the area of Fractions, was relatively low. It does not only happen in the fourth grade but up to the fourth-grade elementary school. The students had difficulty explaining the basic concept of Fractions themselves, also in ordering Fractions, and were slow in equating denominators in a Fraction operation. Especially in terms of solving story problems and problem-solving. Among the reasons given by teachers for this low level of student mastery is that students' understanding of the mathematical operations of addition, multiplication, and division from the previous class is relatively low, and Fraction subject, which is based on mathematical operations becomes increasingly difficult to learn, especially when it comes to solving problems. Students often misinterpret questions because they do not understand the problem posed. Therefore, Fraction includes material with a classically low completeness value. In the learning process, the description given by students is that learning Mathematics is monotonous, unpleasant, and even scary when they get exercises, assignments, or homework (PR). Especially when dealing with teachers who get angry easily, this can result in them being willing to take a day off if they cannot answer the homework. It reduces students' desire and interest in learning Mathematics. Additionally, when studying, teachers often explain on the blackboard several example questions, and then students are asked to answer the exercises in the book, in the sense of the word still using the conventional learning model. Sometimes, teachers provide exercises in ready-to-use worksheets, where the example questions are at cognitive level 3 and "HOTS" questions. As a result, when students work on story problems in the form of problem-solving, they often answer as best they can without relating it to other prerequisite abilities so that the learning outcomes are far from the teacher's expectations.

In response to the problems above, teachers should carry out educational innovations, one of which is by using learning models in teaching. According to Isrok'atun et al. (2018), this learning model is a pattern, variety, and reference for something to be created or produced in learning as a guide for teachers in carrying out learning activities to achieve the expected goals. Irviana (2020) also explained a learning model is a way of learning with some goals and syntax to achieve learning objectives. Learning starts from beginning to end by applying various methods of teaching and learning activities. To achieve the expected goals, learning is made into an overall design that includes a strategic approach, technical methods, and tactics in the process. Many learning models can be used in teaching Mathematics in Fractions in elementary schools, but for the scope of this topic, the researcher uses the inquiry learning model.

According to Isrok'atun et al. (2018), the inquiry learning model is a learning process based on achievement and discovery through a systematic thinking process. Knowledge is not several facts from remembering but the process results of discovering them yourself. Thus, in the planning process, the teacher does not prepare several topics that must be used but designs learning that allows students to find for themselves the topic they must understand. Hamalik (2002) explained that the inquiry process requires the teacher to act as a facilitator, resource person, and group instructor. Meanwhile, students must be encouraged to seek their understanding rather than being stuffed with knowledge. Therefore, inquiry learning will make it easier for teachers to teach. Arifuddin (2018) found a significant influence between the

inquiry learning model on mathematical problem-solving abilities in the fourth grade of Madrasah Ibtidaiyah.

According to Sanjaya (2008), inquiry is a series of learning activities that focus on the process of thinking intuitively and intuitively analyzing searching for and finding answers to a particular problem in question. The thinking process is usually carried out through questions and answers between the teacher and the students. The inquiry learning process provides an impact on intuitive students having a real and active learning experience so that the students are trained in solving problems while simultaneously creating intuition. According to Rochani (2019), the advantages and disadvantages of the inquiry learning model are that students actively participate in learning activities. Learning activities for guided inquiry can facilitate students' meaningful learning with direct involvement in learning. The learning atmosphere provides academic activities that are more useful for students. Apart from that, students use their abilities to complete each stage of learning. It encourages students to participate actively to develop their abilities and understand the teaching topic well so that they can apply it in various problem situations that are in line with the concepts that have been discovered. Cultivate and at the same time, instill an attitude of discovery. The application of inquiry learning focuses on students learning subjects in independently discovering the concepts of the topic being studied. Learning activities require students to think and work to complete something with their abilities. It can train students to continue trying to complete each activity until they can finally discover the concept of the topic through understanding each instruction during the learning process.

When studying, students need to get stimulation so their inner motivation can grow well. Motivation to learn can be in the form of fundamental or internal drives and incentives outside the individual or rewards as a problem in the classroom. Svinicki (2004) stated that learning motivation is power, encouragement, or strength, both coming from oneself and from outside that encourages students to learn. Additionally, Brophy (2004) stated that in learning activities, motivation can be said to be the overall driving force within the student, which gives rise to learning activities, which ensures the continuity of learning activities and provides direction to learning activities so that the goals desired by the learning subject can be achieved. It is in line with the opinion of Uno (2016) that motivation occurs when someone has the desire and willingness to carry out an activity or action to achieve their goals. Prananda and Hadiyanto (2019) stated that motivation has several learning principles including (1) praise will be more effective than punishment, (2) all students have psychological needs (which are basic) that must be satisfied, (3) motivation originating from within the individual is more effective than motivation imposed from outside, (4) answers (actions) that are harmonious (according to desires) require strengthening efforts, (5) motivation easily spreads to other people, (6) clear understanding regarding learning goals will stimulate motivation, (7) each student has a different level of frustration and tolerance. Providing motivation that is implemented appropriately according to these principles will provide benefits and have a good influence on the student learning process.

A conventional learning model is one of the learning models that is often used by teachers because it is easy and not complicated. However, the teachers know this model has many shortcomings and is considered no longer relevant. Conventional learning, also classical

learning, is a learning pattern that emphasizes the teacher's authority in learning. In addition, the conventional learning model is used as a means of oral communication between teachers and students in the learning process. This learning mode allows students to intuitively memorize a lot of topics that have been provided by tutoring. The emphasis is more on insight without devoting much time to intuitive students in the world, understanding the topic and understanding it with previous knowledge, or applying it to real-life situations (Elby, 2001). According to Anggraini (2021), the conventional learning model has the following characteristics: (1) Student learning is a passive recipient of information. It means that students only receive knowledge from teachers. (2) Behavior is based on habits. (3) Knowledge has an absolute nature and a final nature. (4) Guirui becomes an intuition for the continuity of the learning process. (5) Interactions that occur with students. The opinions above indicate that conventional learning relies on topic immersion through guidance. This type of learning is intuitive from the usual learning that is usually carried out so that its implementation is less likely to bring attention to the irregularities of the learning situation.

The characteristics of fourth-grade elementary school students in various statements said that students in the learning and teaching process are a group of humans who have not yet matured in physical and spiritual terms. Therefore, it requires coaching, mentoring, education, and the efforts of other people who are considered mature so that students can achieve their ideas. However, in this case, it does not mean that the student is a weak creature without any potential or ability. By nature, they have the potential and abilities or an intuitive talent. It is just that they have not reached the optimal level of balancing her potential. Due to this, teachers must be able to organize learning and teaching activities and respect their students as individuals with skills and abilities.

The development characteristics of students in the fourth grade of elementary school are characterized by the beginning of the development of more complex thinking, acting, and social influence skills. Student development includes physical development, socio-emotional development, and leads to intellectual development. Physical and sociological development has a strong contribution to students' intellectual development, mental development, or cognitive development. According to Santrock (2011), the end of childhood for fourth-grade elementary school students is a time crisis in the drive for achievement. In achieving this, children develop a helpless orientation where if they view their behavior as a failure, they will simultaneously feel anxious, which will result in a feeling of inferiority. On the other hand, if children have a capability orientation, children will be more concerned with their learning strategies. According to cognitive psychology theory, Dreyfus (1991) explained the characteristics of students in teaching and learning Mathematics according to experts as follows: Elementary students are at the concrete operations stage, meaning that the learning process should provide opportunities for students to manipulate objects.

Methodology

This research aimed to see the influence of the inquiry learning model and learning motivation on the ability to solve Fraction problems in elementary schools. Apart from that, this research also compared the effect of high learning motivation and low learning motivation

on Fraction problem-solving abilities. The population of this research was elementary schools in SDN 06 *Lasi Mudo* dan SDN 08 Kubang Gugus II, *Canduang* District. The schools selected in this research were based on several things, including similarities in accreditation scores. Similarities in school completion criteria, number of students, etc. This research was carried out in the fourth grade of elementary school semester 1 of 2023/2024. This research uses a quantitative approach with the quasi-experimental design method. The research design is to provide treatment and look at the posttest results. The tests used in this research were normality, homogeneity, t-test, and two-way ANOVA tests with a significance level of 0.05. The implementation time is from November 8 to December 8, 2023

Results and Discussions

The research entitled "The Influence of the Inquiry Learning Model and Learning Motivation on Fraction Problem-Solving Ability in Elementary Schools", which was carried out in November - December 2023 at SDN 06 *Lasi Mudo* and SDN 08 Kubang Duo Koto Panjang, *Canduang* District, Agam Regency, was held in 5 meetings. A description of the research results is in Table 1 below:

Table 1. *Statistical description of Fraction learning outcomes for the fourth grade of elementary school*

Descriptive Statistics

	N	Minimum	Maximum	Sum	Mean	Std. Deviation
Experimental class	27	43	90	1790	66.30	15.089
Control class	25	30	83	1540	61.60	12.364
High experiment	14	63	90	1100	78.57	8.950
High control	14	60	83	968	69.14	6.893
Low experiment	13	43	67	689	53.00	6.745
Low control	11	30	67	570	51.82	10.759

Based on the table above, the number of students in the experimental class who were treated with the inquiry learning model was 27 students, and the control class with conventional learning was 25 students. Of the 27 students in the experimental class, 14 students have high learning motivation, and 13 others have low learning motivation. For the control class, there are 25 students, with 14 people having high motivation and 11 people having low motivation. The table also shows the average scores of the two classes. The experimental class has a mean of 66.30, and the control class has a mean of 61.60. The mean for the experimental class with high motivation is 78.57, where this value is higher than the mean for the low motivation control class, namely 69.14. Likewise, the experimental class with low motivation obtained a mean of 53.00, and this value was also higher than the mean of low motivation in the control class, namely 51.82. It shows an increase in learning outcomes in the experimental class with the inquiry learning model.

The normality test for the data distribution on the Fractional problem-solving abilities of experimental and control class students was carried out using SPSS 25, with the test results depicted in Table 2.

Table 2. *Data normality test results for the experimental class and control class*

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Experimental class	.155	25	.122	.928	25	.077
Control class	.156	25	.121	.955	25	.325
High experiment	.145	14	.200*	.928	14	.289
High control	.212	14	.088	.917	14	.200
Low experiment	.234	11	.095	.918	11	.305
Low control	.160	11	.200*	.951	11	.652

a. Lilliefors Significance Correction

Normality test with sig level. (2-tailed) 0.05, and the basic decision is to accept Ho if the sig value. > 0.05, then the data is normally distributed. From Table 3, all data has a sig value. (2-tailed) above 0.05, so it indicates that all data is normally distributed. The homogeneity of variance test was carried out using the Barlett test, which was carried out on data on the Fraction problem-solving abilities of experimental and control class students. The results of the calculation of the homogeneity test of variance in Fraction problem-solving abilities for the experimental class and control class are in Table 3 below.

Table 3. *Data homogeneity test for Fraction problem-solving ability*

Sample class	Mathematics learning motivation	F-count value	F-table value	Conclusion
Eksperiment and control	High	1,622	2,577	Homogeneous
	Low	0,373	2,913	Homogeneous
	Total	1,489	1,966	Homogeneous

Based on the table above, for the experimental and control classes, the f-count value was 1.489, where the f-count < f-table, so the data had a homogeneous distribution. For data from the experimental and control class with high learning motivation, the f-count was 0.373 with F-count 2.913, so that f-count < f-table and shows the data had a homogeneous distribution. Data on the values of the experimental and the control class with low motivation obtained an f-count value of 1.489 and an f-table of 1.966 so that f-count < f-table shows the data had a homogeneous distribution.

To see the influence between the learning outcomes of Fraction problem-solving abilities in the experimental class and the control class, both overall and in the group of

students with high motivation and the group of students with low motivation, a t-test was carried out. The results of this data testing are in Table 4 below.

Table 4. *Results of the t-test for the experimental and control class*

	Class	N	Mean	Std. Deviation	T value	Sig.
Learning outcomes	Experimental	27	66.30	15.089	1.225	.226
	Control	25	61.59	12.362	1.235	.223
Learning outcomes	High learning motivation experiment	14	78.57	8.950	3.123	.004
	High learning motivation control	14	69.14	6.893	3.123	.005
Learning outcomes	Low learning motivation experiment	13	53.00	6.745	.328	.746
	Low learning motivation control	11	51.82	10.759	.316	.756

The calculation of the t-test for the experimental class and the control class on learning outcomes is t = 1.125 and t-table = 2,000 where the t-count < t-table or 1.125 < 2,000 so the conclusion is that there is no significant influence between learning outcomes for the experimental class and the control class. These results found that the influence of the inquiry learning model was not significant or did not have a big effect on the learning outcomes of Fraction problem-solving abilities in the fourth grade of elementary school.

The results of the t-test calculations for the experimental class and control class with high learning motivation on learning outcomes obtained t-count = 3.123 and t-table = 1.706 where the t-count > t-table, so it indicates that there is a significant influence between learning outcomes for the experimental class and the control class in groups of students with high motivation. These results found that in learning using the inquiry model for students with high motivation, there is a significant or big influence on the learning outcomes of Fraction problem-solving abilities in the fourth grade of elementary school. In the results of the t-test calculations for the experimental and control class with low learning motivation on learning outcomes, t = 0.328 and t-table = 1.717 where the t value < t-table, so the conclusion was that there was no significant influence between learning outcomes for the experimental class and control class in the group of students with low motivation. These results found that in learning using the inquiry model for students with low motivation, there is no significant effect or no big effect on the learning outcomes of Fraction problem-solving abilities in the fourth grade of elementary school. In this research, a two-way ANOVA test was also carried out to see the interaction between learning models and learning motivation on the ability to solve Fraction problems in elementary schools. The test results from the two-way ANOVA test are in Table 5 below:

Table 5. *Two-way ANOVA test results on learning models, learning motivation, and problem-solving ability in Fraction*

Tests of Between-Subjects Effects

Dependent variable: Learning outcomes

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Learning model	362.357	1	362.357	5.172	.027	.097
Learning motivation	5922.559	1	5922.559	84.538	.000	.638
Learning model * Learning motivation	218.897	1	218.897	3.125	.083	.061

a. R Squared = .661 (Adjusted R Squared = .639)

For the interaction between the learning model and learning motivation on the ability to solve Fraction problems through the two-way ANOVA test, the calculated F-table value = 3.125 and F-table = 4.034 so that 3.125 < 4.034, so H0 is accepted and H1 is rejected. It indicates no interaction between the learning models and learning motivation on Fraction problem-solving abilities.

Discussion

One of the aims of this research is to see whether there is an influence of the inquiry learning model on the ability to solve Fraction problems in elementary schools. From the results of data analysis through the t-test and two-way ANOVA test, it can be concluded as shown in table 6.

Table 6. *Influence of inquiry learning model and learning motivation on Fraction problem-solving ability in elementary school*

No	Class	N	Mean	T-test with t-count	Two-way ANOVA test
1	Experimental	27	66,30	1,225	Sig. 0,027
2	Control	25	61,59	1,235	
Conclusion				The t-table value is 2.000, so it is 1.225<2.000, with the conclusion that there is no significant influence on the sig value model.	The sig. value is 0.027<0.05 with the conclusion that there are differences in learning outcomes in the two learning models

Based on Table 6, the average learning outcomes in the experimental class were 66.30 higher when compared to the learning outcomes in conventional learning, namely 61.60, and it can be proven through a two-way ANOVA test. Meanwhile, the results of data analysis through the t-test found no significant influence on learning outcomes in looking at the ability to solve Fraction problems in the fourth grade of elementary school.

This fact reveals that the inquiry learning model is better than conventional learning because there is an increase in learning outcomes. It is in line with what Janewar (2021) stated that the inquiry learning model is a series of activities that maximally involve students' abilities to search and investigate systematically, critically, analytically, and logically so that they formulate their findings. The students are much more active compared to conventional classes when treated with the inquiry learning model. In the process, teachers have begun to equip students to think logically, analyze systematically, critically, and creatively, and work together, including student activities in group discussions via LKPD. The students here have started to come up with problem-solving ideas and find various correct solutions. Students' answers to the problems varied according to their expectations, but they all led to the correct answer key. Students are also trained to solve open-ended questions and are given the widest opportunity to express ideas or opinions. Additionally, the answers that emerged also showed that there were stages in students' thinking that were more structured. Step by step, it appears according to the syntax of the inquiry learning model so that students can make decisions in solving mathematical problems.

In addition, another reason for the absence of a significant effect is the time for implementing the inquiry learning model in the classroom. One of the weaknesses of the inquiry learning model is sometimes its implementation requires a long time (Adisusilo, 2012). Research conducted during five meetings showed several obstacles that occurred, including students who were used to learning using conventional learning, where teachers explained directly without equipping students with logical, analytical, systematic, critical, and creative thinking and working together had to get used to gaining knowledge. from what he hypothesized and find his solution to the problem. Therefore, when learning in class is changed towards learning that provides experience, students need to try hard to understand the stages of inquiry learning. Changing students' mindsets requires continuous practice, and one of the weaknesses of the inquiry learning model is that it takes a long time to use.

Another reason this happens is that teachers need to pay attention to the characteristics of inquiry learning. Habits that have been oriented towards learning outcomes must be changed to learning that is oriented towards processes and results. To change this habit, teachers need to try so that the lecture learning strategy that has been going on can become progressive and open to renewal. When students learn using the inquiry learning model, sometimes teachers think about the orientation toward learning outcomes, so that in the discussion process carried out by students, the teacher plays a role not as a director but rather as explaining the topic. It is caused by the teacher's anxiety about inaccurate results, and results in the group discussion process not being optimal. This change cannot happen shortly because teachers need to change habits that have only been result-oriented to learning that is process- and result-oriented (Janewar, 2021).

The effect of high learning motivation on Fraction problem-solving ability

The influence of high learning motivation on the ability to solve Fraction problems is from the relationship between the two in Table 7.

Table 7. *Relationship between learning motivation and Fraction problem-solving ability*

No	Class	N	Mean	T-test with t-count	Two-Way ANOVA Test
1	High motivation experimental	14	78,57	3,123	Sig. 0,000
2	High motivation control	14	69,14	3,123	
Conclusion				The t-table value = 1.706, so 3.123> 1.706, with the conclusion that there is a significant influence on the model.	The t-table value = 1.706, so 3.123> 1.706, with the conclusion that there is a significant influence on the model.

Based on Table 7, the average test results with high learning motivation on problem-solving abilities in Fractions for the experimental class were 78.57, while for the control class, it was 69.14. It shows that the average score of the class using the inquiry learning model is higher than the class learning with the conventional approach. The maximum and minimum scores for classes that study with the inquiry learning model (90 and 63) are also higher than classes with the conventional approach (83 and 60). Additionally, from the results of the t-test with a significance level of 0.05, the t-count was 3.123, which was > t-table value, so in this test, there was a significant influence on the problem-solving abilities in inquiry learning model classes and conventional learning with high learning motivation. Based on the analysis above, learning using the inquiry model can increase learning motivation so that students' ability to solve Fraction problems also increases. It is because the inquiry learning model approach is a learning approach that challenges students to learn actively and creatively in finding solutions to problems. Students with high learning motivation who study using the inquiry learning model approach feel challenged to develop their creative ideas and find different solutions to each problem presented. Students learn to interact with groups and provide information to fellow group members. The ideas they provide are then collected and combined. Students become rich with solutions and get used to being confident in expressing their creative thoughts and ideas. It is in line with the opinion of Subekti (2013) that students who are motivated to learn something will use higher cognitive processes in studying the topic so that students will absorb and digest the topic better.

Indirectly, students with high learning motivation will also be more persistent in carrying out assignments, be interested in new things, and have high enthusiasm in following each stage of the learning process presented by the teacher. Utami et al. (2022) explained that the learning process requires motivation. Motivation will move students to do something closely related to the learning process. If students are motivated, they will carry out meaningful learning so that the level of achievement of learning outcomes will be high. They also explained that in the

learning process, there is an influence between learning models, problem-solving abilities, and learning motivation.

It is different from students with high learning motivation in conventional learning classes. They think that learning feels normal and is no different from their learning activities on previous days, so the learning process feels stiff. During the learning process, they are given an example, observe the teacher's explanation, and then students will work on different problems guided by the solutions given by the teacher. Students are not used to expressing opinions, and there is no effort to find various correct answers to a problem. They feel that it is enough to solve a problem or problem using only one method that is usually used without having to look for or think about alternatives and other possible answers. Based on the description above, the results of the Fraction problem-solving ability test with high learning motivation who study using the inquiry learning model approach are better than students who have high learning motivation who study with the conventional approach, and this needs to be maintained so that learning can form students who have critical, analytical, systematic, and creative thinking.

The effect of low learning motivation on Fraction problem-solving ability

The effect of low learning motivation in the experimental class with the inquiry learning model and the control class with conventional learning is in Table 8.

Table 8. *The influence and differences between inquiry learning models and conventional learning conventional*

No	Class	N	Mean	T-test with t-count	The two-way ANOVA test
1	Low motivation experimental	13	53,00	0,328	Sig. 0,000
2	Low motivation control	11	51,82	0,316	
	Conclusion			The t-table value = 1.717 where 0.328 <1.717 with the conclusion that there is no significant influence on the model	Sig value. 0.000<0.05 with the conclusion that there are differences in learning outcomes in the two learning models

Based on the test results contained in Table 7, the average learning outcome for low motivation in the experimental class (inquiry model learning) was 53.00, and for the control class with low motivation (conventional learning) was 51.82. It illustrates that the average of the experimental is higher than the control class, which shows differences in learning outcomes between the two classes. However, based on the t-test, the t-count was 0.328 < 1.717 (t-table), which means that in this research, there was no significant influence found on problem-solving abilities in classes with inquiry learning models and conventional learning with low motivation. Regarding learning motivation, teachers need to pay attention to several things that motivation is closely related to learning needs, in this case, experienced teachers must be wise enough to utilize

students' needs so they can stimulate students' enthusiasm for learning to become a child who loves learning (Djamarah, 2011). The same research conducted by Natidjah (2020) showed that the inquiry learning model does not affect the mathematics learning motivation of the fourth-grade students at State Elementary School, Kembangbahu District, Lamongan Regency. Considering the importance of motivation as a driving force in action, if students lack this motivation, teachers should try to encourage outside, namely extrinsic motivation. Here, it is necessary to use forms of motivation accurately and wisely. Apart from that, in problem-solving topics, students need communication to understand problems. Students with low motivation are still used to old learning, namely conventional learning, where the teacher explains the subject matter without providing provisions for students to think logically, analytically, systematically, critically, and collaboratively. Therefore, when learning shifts to an inquiry model, students with low motivation will have difficulty understanding problems. It is where the teacher's role is to explore the motivation that exists in students intrinsically and extrinsically. According to Prananda and Hadiyanto (2019), motivation is the encouragement given by teachers to students to foster self-confidence and enthusiasm for learning. The fourth-grade elementary school students who were treated with the inquiry learning model were in a period of high-grade development. Djamarah (2011) stated that students have an interest in concrete, practical daily life. Solving problems in Mathematics is not easy and practical in students' lives. To generate interest in learning, teachers need to foster and generate motivation so that learning can be fun. The inquiry learning model carried out will be somewhat hampered if the teacher cannot arouse their interest.

Interaction between learning model and learning motivation on Fraction problem-solving ability

The calculation results of the fourth hypothesis test using the two-way Anava test show that f-count = 3.125 < f-table = 4.034, so H0 is accepted, and there is no significant interaction between the learning model and student learning motivation on Fraction problem-solving abilities. It means that the ability to solve Fraction problems in students who study using the inquiry learning model and conventional learning does not have a significant interaction when it comes to learning motivation on the ability to solve Fraction problems in the fourth grade of elementary school. The fourth-grade elementary school students have intellectual characteristics that will later influence their learning motivation. The students' characteristics are having a fairly good memory, the ability to memorize abstracts, which is starting to increase, liking rules and things that make sense, being able to start classifying, collecting things they like, being able to concentrate well, being able to read, in a relatively long time and be a person who can solve problems well (Adisusilo, 2012). It shows that children at that age are just starting to develop their existing abilities, such as independence, self-confidence, and other intellectual abilities but they still do not have clear goals in life, do not have creativity in learning, and cannot instill discipline in following learning. This results in students still needing teachers as the dominant source of learning, so improving learning and providing inquiry learning capital is difficult to have a significant influence on students' learning motivation in the fourth grade of elementary school.

The inquiry learning model is also a model that has several advantages compared to conventional learning models. One of the advantages of this inquiry learning model is that it can provide space for students to learn in their own style. This model is also considered one of the lessons of the development of modern learning psychology. Learning is considered a process of changing behavior through learning experiences. However, this inquiry learning model has weaknesses. One of the weaknesses is that it takes a long time for teachers and students to adjust. Apart from that, if the criteria for success are only determined by the result, this strategy still seems difficult to implement (Nutt, 1989). The inquiry learning model refers to several principles. The first is the principle oriented towards intellectual development. Apart from being oriented towards learning outcomes, this learning is also oriented toward the process itself so that the results are not the major goal. The second principle is the interaction between students and the interaction of students and teachers, even the interaction of students with the environment, making this model need to be developed in the educational process. The third principle is asking questions, where students are required to be critical, and always ask questions about the phenomena being studied, but in this principle, teachers are also required to have the ability to create topics and develop student activity sheets later. The fourth principle is learning to think, namely maximizing the utilization and use of the brain so that learning is not only about remembering several facts but also the thought process. The final principle is the principle of openness. This principle allows students to develop hypotheses and openly prove the truth of the hypothesis put forward. Therefore, this principle can be interpreted as allowing students to find out the answer to every question they have in mind, of course, with the help of the teacher as a facilitator (Arifuddin, 2018). From the description above, the inquiry learning model can be given in the fourth grade of elementary school in solving mathematical problems, especially Fractions, of course, to be able to relate this to increasing learning motivation. Teachers need to increase their creativity in implementing this learning model. Apart from that, teachers also need to generate motivation for themselves and students so that changes in learning through this model will have a significant impact.

Conclusions

Based on the problem formulation, research objectives, and discussion related to the influence of the inquiry learning model and learning motivation on the ability to solve Fraction problems in the fourth grade of elementary school, indicated: (1) The ability to solve Fraction problems learned using the inquiry learning model is better than the ability to solve Fraction problems in classes that use conventional learning, but there is no significant influence between the inquiry learning model and conventional learning, (2) The ability to solve Fraction problems in students who learn using the inquiry learning model is better than the ability to solve Fraction problems who learn using learning conventional for students who have high motivation. This inquiry learning model and conventional learning have a significant influence on the ability to solve Fraction problems in students with high motivation. (3) The ability to solve Fraction problems in students who learn using the inquiry learning model is better than the ability to solve Fraction problems who learn using conventional learning for students who have low motivation. However, this inquiry learning, and conventional learning model does

not have a significant influence on the ability to solve Fraction problems in students with low motivation. (4) There is no interaction between the inquiry learning model, conventional learning, and learning motivation on the ability to solve Fraction problems in the fourth grade of elementary school.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest.

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