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Improving the Concept Understanding of Mixed Fractions Calculation Operations Using the Jigsaw Method Assisted by Trimino Media

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ABSTRAK

Penelitian ini untuk menganalisis pengaruh signifikan pemahaman konsep materi menghitung operasi pecahan campuran dengan metode Jigsaw berbantuan media Trimino. Penelitian ini menggunakan desain nonequivalent control group design dan metodologi kuasi-eksperimen kuantitatif. Partisipan dalam penelitian ini adalah seluruh siswa kelas IV dari dua kelas yang berjumlah 50 orang. Simple random sampling digunakan untuk proses pengambilan sampel, dan diperoleh 25 siswa sebagai kelas yang diberikan perlakuan berupa metode Jigsaw dengan media trimino, dan 25 siswa sebagai kelas yang diberikan perlakuan berupa metode konvensional. Lembar kerja pretest dan posttest dengan soal esai merupakan format pengujian yang digunakan dalam penelitian ini. Ujian dilaksanakan dua kali, satu kali sebelum dan satu kali sesudahnya. Pertemuan dilaksanakan sebanyak delapan kali untuk penelitian ini: satu kali untuk pretest, enam kali untuk teknik Jigsaw dengan menggunakan media trimino, dan satu kali untuk posttest. Instrumentasi penelitian ini terdiri dari tes, observasi, dan dokumentasi. Uji-t yang sebelumnya telah diuji homogenitas dan normalitasnya digunakan dalam prosedur analisis data. Hasil penelitian menunjukkan adanya pengaruh yang signifikan terhadap pemahaman konsep siswa pada kelas yang menerapkan metode Jigsaw berbantuan media trimino, dengan taraf signifikansi 5%. Uji hipotesis uji t menunjukkan bahwa H0 ditolak dan H1 diterima apabila t-hitung (6,211) > t-tabel (2,011). Hal ini menunjukkan bahwa penggunaan metode Jigsaw berbantuan media Trimino dalam menyelesaikan permasalahan matematika memberikan pengaruh yang baik terhadap pengetahuan siswa kelas IV pada materi pengertian operasi hitung pecahan campuran.

ABSTRACT

This research is to analyze the significant influence of understanding the material concept of calculating mixed fraction operations using the Jigsaw method assisted by Trimino media. This research uses a nonequivalent control group design and quantitative quasi-experimental methodology. Participants in this research were all 50 class IV students from two classes. Simple random sampling was used for the sampling process, and obtained 25 students as a class who were given treatment in the form of the Jigsaw method with trimino media, and 25 students as a class who were given treatment in the form of the conventional method. Pretest and posttest worksheets with essay questions are the testing format used in this research. The test was carried out twice, once before and once after. Meetings were held eight times for this research: once for the pretest, six times for the Jigsaw technique using trimino media, and once for the posttest. The instrumentation of this research consists of tests, observations, and documentation. The t-test, which had previously been tested for homogeneity and normality, was used in the data analysis procedure. The results of the research show that there is a significant influence on students' conceptual understanding in classes that apply the Jigsaw method assisted by Trimino media, with a significance level of 5%. The t-test hypothesis test shows that H0 is rejected and H1 is accepted if t-count (6.211) > t-table (2.011). This shows that the use of the Jigsaw method assisted by Trimino media in solving mathematical problems has a good influence on the knowledge of class IV students in the material of understanding mixed fraction calculation operations.

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1. INTRODUCTION

Mathematics is the most important educational material. This is not only important in the field of education, but also as the basic science of all science in the world. Mathematics can help students think better, argue better, and deal with everyday problems. Mathematics is a basic science that is used to study other sciences. Thus, it is very important to understand mathematics and understand its principles properly from a young age. Another basic skill for improving mathematical skills is conceptual understanding (Jannah, 2021). One of the most common problems when learning mathematics is that it is taught abstractly. Students face difficulties in dealing with mathematical problems because mathematical concepts are very abstract (Hutari et al., 2020; Nurhikmayati, 2017). This makes it difficult for children to learn mathematics and leads to a lack of conceptual understanding in them when they try to solve problems that require methodical calculations, which negatively impacts their grades in material such as mixed fraction operations. In fact, there were errors in handling the questions given, as shown by the findings of the students' work. This shows that students' conceptual understanding must be improved (Az Zahra & Erianjoni, 2022; C. Utami & Anitra, 2020). Basically, learning mathematics means studying the concepts and structure of the language (Wirantasa, 2017; Yusuf Aditya, 2016). One of the components that students need to get to learn mathematics is understanding student concepts. Students will find it easier to solve difficulties if they fully understand the concept because they will be able to apply the concept to the situation at hand and find a solution. On the other hand, if students do not fully understand the ideas, they may find it difficult to use and select certain problem-solving techniques. The first step in preparing students to use the principles of arithmetic in their daily lives is for them to understand the topics covered in the math sessions.

Based on observations carried out at SD Negeri Jakasetia 1, South Bekasi, researchers saw that in 2013, the curriculum education system was used in the teaching and learning process carried out by teachers at SD Negeri Jakasetia 1, South Bekasi City. There are still several learning objectives for students in class IV under the KKM (Minimum Completeness Criteria) even though the 2013 curriculum is implemented in minimal mathematics topics, one of which is material on mixed fraction calculation operations. In the learning process, students often only take in the information presented by the instructor, learn only from what they can remember, and only solve problems based on examples. If the problem is not similar to the example, students simply memorize the formula without understanding its significance. This shows that students have difficulty understanding mathematics classes because they are too abstract and full of formulas and calculations. As a result, students do not understand mathematical concepts, namely the learning process is not interesting and learning techniques are not appropriate to the problems students face, so they do not show much interest in learning. Mathematical problems such as mixed fraction calculation operations can be solved using calculation operations such as addition, subtraction, multiplication and division. Students find it very difficult to understand because of this. Although students often use materials for calculating mixed fraction operations, they often make mistakes when working on and handling problems with fraction materials because they do not fully understand the idea of fractions. Thus, it is very important that students gain a solid understanding of certain mathematical ideas. This requires media and media. The problem that is often found in educational mathematics is that it is an effective tool and is often needed for students to master the concepts and techniques of school mathematics material and mathematical theory in general (Rathour, 2022; YP Utami & Cahyono, 2020).

Based on the description above, a way that can be implemented to improve the learning process is to make improvements to the learning process (Nurhadi, 2018; Zulfah, 2018). Therefore, the first step to improve the situation is to draw on students' conceptual knowledge and use interesting teaching strategies and media for learning mathematics. Considering the importance of competency requirements that must be achieved by students, there needs to be a change in the choice of learning techniques. Technique is a way of carrying out an activity systematically (Anjani et al., 2020; Mekarisce, 2020).Students who use appropriate teaching strategies will be more enthusiastically involved in class activities and will not find them boring or monotonous. Learning strategies are beneficial for both instructors and students. By using strategies, teachers can more easily ensure that their students understand the information without having to repeat it. Jigsaw is a cooperative learning technique in which peers consist of a small group who depend on each other and are taught part of the regular curriculum (Asbanu et al., 2023; Phuntsho & Gyeltshen, 2022).Jigsaw technique is a cooperative learning technique where students take more responsibility than the teacher. The Jigsaw learning paradigm aims to increase students' awareness of their own learning and that of others as a source of responsibility. This technique involves the instructor paying attention to students' schemas or previous experiences and assisting students in bringing these schemas to life to make the learning material more relevant. Students also collaborate with classmates in a spirit of mutual support and have several opportunities to digest material and develop communication skills. In small groups of 4 to 6 students, using the Jigsaw technique, students collaborate. This group has positive dependence on each

other and each student is responsible for studying each part of the lesson material and conveying the material to other group members (Hasanah & Himami, 2021; Hasibuan, 2019).

There are also steps in the Jigsaw type cooperative learning model in mathematics learning material on mixed fraction calculation operations that have been adapted, namely, first students study the course material that the instructor has found about the process of computing mixed fractions. With the help of the teacher, they create groups and give assignments to each group. Five students form the initial group in each group. Each set of pupils is assigned to study a separate subject. Second, students gather with other group members who work with the same content (expert team) or on the same task, and they communicate and find out their differences with the expert group members. Third, after reporting their respective assignments to their expert group colleagues, students rejoin their original groups. The teacher corrects the students' skewed perceptions while the home group discusses and presents the learning objectives (Ardiawan et al., 2020; Joyo, 2020).Based on the steps of the Jigsaw technique, it can be designed as shown inFigure 1. The topics outlined in Figure 1 would be conducive to an adapted Jigsaw class that can be easily divided into subtopics, but is still challenging for students. Students are given letters and numbers to form groups. The letter corresponds to their subgroup, and the number corresponds to their home group. For example, if a student is given the assignment "C2", the initial group is "C", and the subgroup is "2 yellow" see in Figure 1. Students in the initial group work together to tackle the final assignment. The topics described in Figure 1 would be conducive to a modified Jigsaw class so that the areas can be easily divided into subtopics, but remain challenging for students. To determine groups, students are given letters and numbers. The letter corresponds to their home group and the number corresponds to their subgroup. For example, if a student is given the task "C2", the original group is "C" and the subgroup is "2 yellow". The original group is a group of students who work together to create a final assignment. Meanwhile students learn about their specific fields in their subgroups so they can bring this knowledge back to their home groups.

The steps for the Jigsaw technique are based on the design of the Jigsaw technique. This technique is very effective and innovative, so all students are active and can master the material found in discussions with their groups. The jigsaw technique has advantages, namely that it first gives each student the opportunity to work together with other students so that good interpersonal relationships are established. Second, give each student the opportunity to understand the content they need to gain better knowledge and a broader perspective. Third, there is no discussion about any problem, and every student in the class has the same right to be in the expert group. Fourth, they can openly share their thoughts without fear because they must be confident enough that they understand each subject discussed. Fifth, empower everyone with a sense of accountability because they are all responsible for the views or knowledge they gain (Sukmawati et al., 2023). In this Jigsaw technique, students are able to work in teams and master the material, so they really understand the material they are studying.

The Jigsaw technique combined with Trimino media will direct students to learn and play games in groups more effectively. So that students can understand and be motivated to be involved in learning activities, teachers must be more creative when arranging lesson material. One of these techniques is to use learning media as a tool to provide or teach learning material in accordance with the learning objectives to be achieved (Faustina et al., 2020; Siswalo, 2018).Trimino cards are a triangular shaped instructional tool that engages students of arithmetic rather than cards used for gambling. To understand the basics of addition and subtraction, trimino cards are used. These mathematical Trimino cards were created as a tool by researchers and are findings from previous work. Students who have learning difficulties can benefit from the application of Trimino media to improve their learning findings and strengthen their knowledge of mathematics material. Additionally, students have the opportunity to improve their own skills by utilizing triminos as a mathematics learning tool (Faustina et al., 2020; Siswalo, 2018). Triminio media has benefits such as: a) being able to offer interesting experiences and help students understand mathematical concepts; b) able to improve students' brain training for all types of equations in trimino media; c) able to inspire students' enthusiasm for learning mathematics; d) able to increase student cooperation; and e) able to reduce students' boredom in learning (Faustina et al., 2020; Tafonao, 2018).

Students need to have strong conceptual knowledge in order to master the ideas found in mathematics. According to the Big Indonesian Dictionary, understanding is described as having a lot of information, strong ideas, and correct understanding. Understanding anything requires the capacity to articulate knowledge in a comprehensible way, offer interpretations, and categorize it (Kusmawati et al., 2022; Pesurnay, 2021).Understanding a learning objective that is able to understand the material with learning experience, and facilitates transfer. Demonstration of relationships between external representations allows observation and assessment of student understanding (Hasnunidah, 2017; Thurtell et al., 2019). In addition, the application of representations can be used as a measure of the accuracy, richness, and quality of a teacher's mathematics teaching (Thurtell et al., 2019) . While this is important for

instructors as well, representations support student learning. The term "concept" comes from the Latin word "concipere," meaning "to understand, take, receive, grasp," in various forms. Common objects that define events, objects, and ideas allow people to communicate with each other and understand more clearly. These items are known as concepts. Understanding a concept is having the mental capacity to use what one has learned to carry out actions appropriately, effectively, and in their own words. Students who can show indicators of understanding concepts in tests, these students show good concept understanding skills (Suci & Miatun, 2022).The following are some signs that an idea has been understood: 1) Skill in restating a concept; 2) the skill to offer examples of concepts or not; and 3) Able to implement ideas (Farias et al., 2009). Understanding concepts is a skill that all students must have because it makes it easier for them to understand, as well as absorb and transmit information so they can recall it in the future. The goal is to increase students' knowledge of the topic by making the concepts simpler for them to understand with clarification of the subject's ideas (Masitoh & Prabawanto, 2022; Sabbah, 2016).

Calculation operations are mathematical operations such as adding, subtracting, multiplying, dividing, etc. to see the value or answer to something (Kristina & Talitha, 2021; Lestari & Suryadi, 2020).One of the most important areas for a student to improve in classroom arithmetic is fractions (Copur-Gencturk, 2021; Yusri, 2018). Mathematical concepts involving mixed fractions are first taught in elementary school. Competency criteria in studying mixed fractions, namely employing them to solve problems. A fraction is considered mixed if the numerator and denominator consist of whole numbers and fractions. There are also examples of mixed fractions in the form 1 1 where 1 is a whole number and 1 is an improper fraction (Maftuchah, 2022). There are also operations on mixed fractions, the same as the previous fractions, which include addition, subtraction, multiplication and division.

Previous research in line with this research states that the application of Jigsaw teaching techniques instills a sense of cooperation in learning among students (Ribut, 2021).The next research specifies the application of Trimino media, which states thatthe application of Trimino Mathematics media in a cooperative atmosphere offers opportunities for students to develop their potential, and when playing Trimino students can play while learning (Alim et al., 2015). Subsequent research that is relevant to this research also states that there is an influence of cooperative learning assisted by Trimino media on the speed of solving mathematics problems for class students (Amanah et al., 2023; Karmila et al., 2022). Students in experimental and control classes understand concepts differently when it comes to dealing with arithmetic problems. This disparity can be related to the study procedures used. During the learning, the experimental class received therapy using the Jigsaw technique assisted by trimino media for six meetings, while the control class underwent learning using traditional techniques for six meetings. Because the Jigsaw technique, supported by Trimino media, immerses students in a game environment as they learn, there are disparities in how well they understand concepts when solving arithmetic problems. This increases their motivation to learn. This research is in line with the research findings entitled "The Impact of Trimikal Media (Triomino Multiplication) on the Learning Findings of Multiplication Class III Students Sdn 2 Kedamean Gresik," students will actively participate in the application of media during the learning process, ensuring that they do not get bored because learning is student-centered (Muridlo, 2018).

The aim of this research is to review and analyze the significant impact of understanding the concept of the operation of calculating mixed fractions using the Jigsaw technique assisted by Trimino media on class IV students at SD Negeri Jakasetia I, South Bekasi City.

2. METHOD

This research was carried out at SD Negeri Jakasetia I, South Bekasi City, in the first semester of the 2022–2023 academic year. The type of research used by researchers is quantitative in the form of a quasi-experimental study. The population in this study were all fourth grade students at SD Negeri Jakasetia I, South Bekasi City, consisting of 50 students in 2 classes. The research design used was a nonequivalent control group design. The sampling technique used is simple random sampling, or random sample. From the findings of the sample selection, class IV B was randomly selected as the experiment, and class IV C was the control class. The experimental class and control class were first given a pretest before the start of the research. During the lesson, the experimental class was treated with the Jigsaw technique assisted by trimino media, while the control class continued to be treated using conventional techniques. At the end of the teaching and learning process, the experimental class and the control class were both given a posttest. This was to see whether or not there was a significant improvement in the impact of the Jigsaw technique assisted by Trimino Media on understanding the concept of mixed fraction counting operations in the experimental class and the control class. This can be seen in the Table 1.

Table 1. The Research Design Form Table

Group	*Pre-Test*	Treatment	*Post-Test*
Test	O_1	X	O_2
Control	O_3		O_4

Information : X: Treatment is learning using Jigsaw Type Cooperative learning media; O_1: Pre-test in the experimental class; O_3: Pre-test in the control class; O_2: Post-test in the experimental class with action; O_4: Post-test in the control class with treatment

Written test instruments in the form of descriptions based on indications of capacity to understand mathematical ideas are used in the data collection approach in research. The purpose of the test approach is to compare students who were taught using the Jigsaw technique assisted by Trimino media with students who were taught using traditional techniques to see which group of students had better knowledge of the content ideas for computing mixed fraction operations. The test was carried out twice, namely pretest and posttest. Pretest is a test carried out before the learning techniques or media are given to students. The pre-test is carried out with the aim of measuring students' initial knowledge and evaluation skills based on previous teacher instructions. and posttest, namely a test carried out with the aim of seeing whether there is or is not a significant improvement with the impact of the Jigsaw technique assisted by Trimino media on students' understanding of the concept of mixed fraction calculation operations that can be mastered by students. The instrumentation of this research consists of tests, observations, and documentation. The following is a grid of instruments and assessment criteria for concept understanding test questions presented in Table 2.

Table 2. The Instrument Grid Table Understanding Mathematical Concepts

No.	Learning Indicators	Indicators of Understanding Mathematical Concepts	Cognitive Level	Question Items
1.	Understand the meaning of mixed fractions	1. Restate a concept. Able to re-explain a concept in a mathematical problem by applying the algorithm completely and correctly.	C1	1,2,3,4,5,6,7
2.	Understand the form of mixed fractions	2. Able to give examples of a concept. Able to identify examples and non-examples of problems in mathematics problems	C2	
3.	Handle problems related to mixed fractions	3. Able to apply concepts. Able to apply concepts or algorithms in solving problems in mathematics.	C3	

Table 3. The Table of Guidelines for Scoring Understanding of Mathematical Concepts

Concept Understanding Indicator	Measured Indicators	Score
Restate a concept	According to this problem, there is no mathematical solution or idea.	0
	Although mathematical theories have emerged, they have not been able to articulate the ideas adequately and continue to make many mistakes.	1
	Some principles have been reiterated, but have not been developed and still have shortcomings.	2
	Can build and spit out certain ideas accurately, but there are some calculations that are wrong.	3
	Can be created with precise counting responses and can accurately reconstruct complete ideas.	4
Give examples and non-examples	According to this problem, there is no mathematical solution or idea.	0
	Although mathematical theories have developed, they cannot specify the ideas they include.	1
	Has been able to offer examples and non-examples that are in accordance with the ideas that the object has but are insufficient and cannot be developed.	2

Concept Understanding Indicator	Measured Indicators	Score
	Has provided examples and non-examples that match the ideas that the object has, although there are some errors.	3
	It can be produced without making mistakes and has the expertise to offer examples and non-examples that match the definition of the item.	4
Apply concepts to problem solving	According to this problem, there is no mathematical solution or idea.	0
	As a logarithm of concept knowledge, mathematical ideas have emerged but have not been able to communicate the concept in various types of mathematical representation.	1
	Can communicate ideas using different mathematical representations, even if they don't fully understand the idea of logarithms.	2
	Can represent ideas in many ways using mathematical representations as logarithms of knowledge of ideas, but they can still make mistakes.	3
	Can offer ideas in many mathematical representations as logarithms of correct ideas and properly understand.	4

(Adopted from Adriana, 2019)

After all the data has been collected, scores are first carried out on the pretest and posttest findings, namely the description test questions. The data techniques used by researchers when analyzing this research data are normality tests, homogenesis tests, and hypothesis tests.

3. RESULT AND DISCUSSION

Result

This research was carried out from 25 May 2023 to 03 June 2023 for the 2022/2023 academic year in classes IV B and IV C at SD Negeri Jakasetia I, South Bekasi with the title The Impact of Jigsaw Techniques Assisted by Trimino Media on Students' Understanding of the Concept of Mixed Counting Operations Material. Class IV of Jakasetia I State Elementary School, South Bekasi.

The research was carried out in 8 meetings, namely 1 pre-test meeting, 6 material meetings, and 1 post-test meeting. This research was carried out consecutively in 2 classes, namely IV B as the experimental class and class IV C as the control class. Using the Jigsaw technique assisted by Trimino media as learning through games, research was carried out to ensure the big impact on students' understanding of concepts in mixed calculation operations material. In this learning process, the researcher previously conducted a pretest at the first meeting in the experimental and control classes, which aimed to see students' skills before implementing the Jigsaw technique learning with the help of Trimino media. The pre-test is carried out with the aim of measuring students' initial knowledge and evaluation skills based on previous teacher instructions (Azmin, 2015). After completing the pretest activities in both experimental and control classes, then at 6 meetings the researchers carried out learning activities using the Jigsaw technique assisted by trimino media in the experimental class, while learning activities used conventional techniques in the control class. At the last meeting the researchers conducted a posttest on the experimental and control classes. The posttest aims to see students' skills after learning the Jigsaw technique with the help of Trimino media. A post-intervention test was given to students to assess their progress (Azmin, 2015).

Research findings are presented as pretest and posttest learning findings for the experimental class and control class, as well as final scores for how well students understand ideas when they solve arithmetic problems in the pretest and posttest in the experimental class and control class. The following data analysis findings are shown in Table 4.

Table 4. The Concept Understanding Findings Table

Class		Total Students (N)	Average (X)	Standard Deviation S	Variance (S)2	Score Min	Score Max
Experiment	Pretest	25	43.86	5.21	27.13	36	54
	Posttest	25	79	7.94	63.05	68	96
Control	Pretest	25	43.29	5.19	26.91	36	50
	Posttest	25	72.29	7.45	55.57	57	86

Based on Table 4, it can be concluded that there is a disparity between the experimental class and the control class in terms of how well students understand the ideas of the pretest and posttest when they solve arithmetic problems. Use t-test to analyze scores. Test the pretest and posttest findings for the experimental class and control class for normality and homogeneity first. Study findings data were analyzed as follows:

The normality test is used to see that two samples come from a normally distributed data population. The normality test using the Liliefors test with the help of Microsoft Excel can be presented in Table 5.

Table 5. The Normality Test Table

Class		Normality			Information
		N	L_{count}	L_{table}	
Test	Pre-Test	25	0.821	0.173	NORMAL
	Post-Test	25	0.840	0.173	NORMAL
Control	Pre-Test	25	0.808	0.173	NORMAL
	Post-Test	25	0.804	0.173	NORMAL

Based on the normality test findings in Table 5, the experimental class students' pretest found L_{count} (0.821) < L_{table} (0.173), and the control class L_{count} (0.808) < L_{table} (0.173) at a significance level of 5%. These findings show that the pretest findings for the experimental class and control class are normally distributed. Meanwhile, the posttest findings for the experimental class students were L_{count} (0.840) < L_{table} (0.173), and the control class L_{count} (0.804) < L_{table} (0.173) at the 5% significance level. These findings show that the posttest findings for the experimental class and control class are normally distributed.

The Homogeneity test using Fisher's test with the help of Microsoft Excel can be presented in Table 6.

Table 6. The Homogeneity Test Table

Group	Class	Variant	F_{count}	F_{table}	Information
Pre-Test	Test	27.126	1.008	1.984	Homogeneous
	Control	26.913			
Post-Test	Test	63.053	1.135	1.984	Homogeneous
	Control	55.570			

The students' pretest between the experimental class and the control class produced F_{count} (1.008) < F_{table} (1.984) at the 5% significance level based on the results of the homogeneity test in (Table 6). Meanwhile, the results of the posttest homogeneity test for the experimental class and control class obtained F_{count} (1.135) < F_{table} (1.984) at the 5% significance level. These results indicate that the experimental class and control class pretest and posttest results were homogeneous and were followed by the t-test. Hypothesis testing

The hypothesis test using the Independent Sample t-test with the help of Microsoft Excel can be presented in Table 7.

Table 7. The Hypothesis Test Table

Group	Class	t-test					Information
		$\bar{x}$	S	$S_{combined}$	Q_{count}	Q_{table}	
Pre-Test	Test	43.86	5.21	27.020	0.550	2.011	There is no dispartas understanding of concepts
	Control	43.29	5.19				
Post-Test	Test	79	7.94	59.311	6.211	2.011	There is a dispartas understanding of the concept
	Control	72.29	7.45				

T_{count} (0.550) < T_{table} (2.011), based on t-test findings between the experimental class and the control class on pretest students (Table 7). This shows that the pretest t-test findings are not different. Meanwhile, the students' post-test findings revealed that T_{count} (6.211) was superior to T_{table} (2.011). So there are disparate posttest t-test findings.

Discussion

Based on data analysis of research findings from pretest and posttest scores in the form of a test of students' understanding of the concept of mixed fraction operations in handling mathematics problems in class IV B as a trial class and class IV C as a control class at SD Negeri Jakasetia I, South Bekasi.

According to the findings of the test score analysis, there was no dispartas between groups of students' understanding of the concept of mixed fraction calculation operations when it came to dealing with students' initial mathematics problems (pretest). In other words, there were no differences in the two average pretest scores in students' understanding of the concept of mixed fraction calculation operations in solving mathematical problems between the experimental class and the control class, and students in both classes had the same understanding of the concept. There is a disparity between the experimental class and the control class in terms of how well students understand the concept of mixed fraction calculation operation material when it comes to solving students' final mathematics problems (posttest) through various stages of score processing, in accordance with the findings of the test score analysis. The Jigsaw technique assisted by Trimino media has a positive impact on understanding the concept of mixed fraction calculation operation material for students in dealing with mathematical problems, as evidenced by the presence of dispartas understanding of the concept of mixed fraction calculation operation material for students in handling mathematical problems between experimental class and control class students. This is consistent with research findings, which show an increase in pretest and posttest scores. The average student scored 43.86 on the pretest, which rose to 79 on the posttest. This shows that there are variations in learning using the Jigsaw technique assisted by Trimino media according to the benefits of each application, which can provide opportunities for other students to understand mathematical concepts and can increase students' mental sharpness for all types of equations in Trimino media.

The findings of this study are in line with the findings of studies which state that the application of Jigsaw teaching techniques instills a sense of cooperation in learning among students (Ribut, 2021).The findings are in line with the next specification on the application of Trimino media, which states thatthe application of Trimino Mathematics media in a cooperative atmosphere offers opportunities for students to develop their potential, and when playing Trimino students can play while learning (Alim et al., 2015). Subsequent research that is relevant to this research also states that there is an influence of cooperative learning assisted by Trimino media on the speed of solving mathematics problems for class students (Amanah et al., 2023; Karmila et al., 2022). Students in experimental and control classes understand concepts differently when it comes to dealing with arithmetic problems. This disparity can be related to the study procedures used. During the learning, the experimental class received therapy using the Jigsaw technique assisted by trimino media for six meetings, while the control class underwent learning using traditional techniques for six meetings. Because the Jigsaw technique, supported by Trimino media, immerses students in a game environment as they learn, there are disparities in how well they understand concepts when solving arithmetic problems. This increases their motivation to learn. This research is in line with the research findings entitled "The Impact of Trimikal Media (Triomino Multiplication) on the Learning Findings of Multiplication Class III Students Sdn 2 Kedamean Gresik," students will actively participate in the application of media during the learning process, ensuring that they do not get bored because learning is student-centered (Muridlo, 2018).

Therefore, understanding the concept of the operation material for calculating mixed fractions using the Jigsaw technique assisted by Trimino media can increase student interaction with other students in conducting discussions, besides that students become active in learning and students' courage to ask questions increases. These findings have a significant impact on the development of mathematics education, especially in terms of learning strategies and understanding concepts. Research shows that the use of the Jigsaw method assisted by Trimino media is effective in increasing students' understanding of the material for calculating mixed fractions. This shows that a collaborative approach to learning can be an effective alternative to overcome the challenges of understanding mathematical concepts in the classroom. Furthermore, the integration of visual media such as Trimino has also been proven to help students understand concepts better. The implications of these findings include the importance of using interactive media in the mathematics learning process to increase student engagement and understanding. However, it is important to remember that this study has several limitations, including a limited sample size and a quasi-experimental research design. Recommendations for future research are to use a larger sample and consider a more robust research design to produce more general and valid results. By taking these limitations into account, further research can make a greater contribution to the development of effective learning strategies in improving understanding of mathematical concepts among students.

4. CONCLUSION

Based on the findings of this research, it can be concluded that there is a positive impact of the Jigsaw technique assisted by Trimino media on understanding the concept of mixed fraction calculation operations in dealing with mathematics problems for class IV students at SD Negeri Jakasetia I, South Bekasi. This is shown by the findings of the t-test on students' understanding of the concept of operations for calculating mixed fractions in solving mathematics problems.

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